2023 Stock Market Outlook

Introduction

Thank you for purchasing the 2023 Market Outlook.

I hope this 2023 outlook can serve as a resourceful guide all year to target quality stocks in industries when trends are favorable. I do not expect you to blindly follow the ideas presented in this report as every investor has his/her own style of investing, different risk parameters and timeframes, as well as everyone's personal outlooks that may differ from my views. The goal here is to open your eyes to names I favor in 2023 for various reasons, a guide to some key trends and themes in investing, and likely introduce you to some exciting stocks that were not on your watchlist as I have always thrived in discovering under-followed stocks that become superstar performers.

The best piece of simple advice is to buy quality companies growing both the top and bottom line in attractive industries with positive tailwinds for growth. Quality means companies that have consistently exceeded earnings expectations in previous quarters, strong management, positive margins, and efficiency ratios (ROE, ROA, ROIC), smart capital deployment and healthy balance sheets. Attractive industry meaning an industry showing growth with low penetration and being involved in secular shifts. It is important to learn sector specific ratios which I try and present in more detail in the Sector Breakdowns section.

I did a post a few years ago on the 7 classes of great investments to pay attention to and that includes pure revenue growth stories in growing markets, compounders with a sustainable MOAT, market share takers and disruptors in large TAMs, product mix shift and margin expansion stories, accelerating growth causing multiple re-ratings, new product and replacement/upgrade cycles, and consolidator stories with synergies and growth.

I do not expect you to enter all these names on day one of 2023 and sit and wait, instead, be active and strategic in entries/exits whether taking a fundamental or technical approach, or even better, a combination. Paying attention to options flow has single-handedly been the greatest tool allowing me to succeed in markets, and something we provide insight on every day at OptionsHawk. One simple rule I like to use is to avoid longs in names where the 8-week EMA has crossed below the 21-week EMA, and vice versa for shorts, it will keep you on the right side of the trade more often than not. Each name mentioned in this report should also be researched further as these are brief views as I am a firm believer that less is more, and you should be able to lay out an investment thesis concisely, but more in-depth due diligence always adds value and confidence to the view.

At OptionsHawk we perform fundamental, technical, ownership trends, and options activity analysis while also discovering the catalysts for a move, and when all of these individual analyses give the same signal, it is a worthy trade/investment. If you are interested in receiving daily research and live market coverage from OptionsHawk, please visit the website at OptionsHawk.com.

Thank you again and I hope you enjoy this year's report. Best of luck to everyone in 2023!

Table of Contents

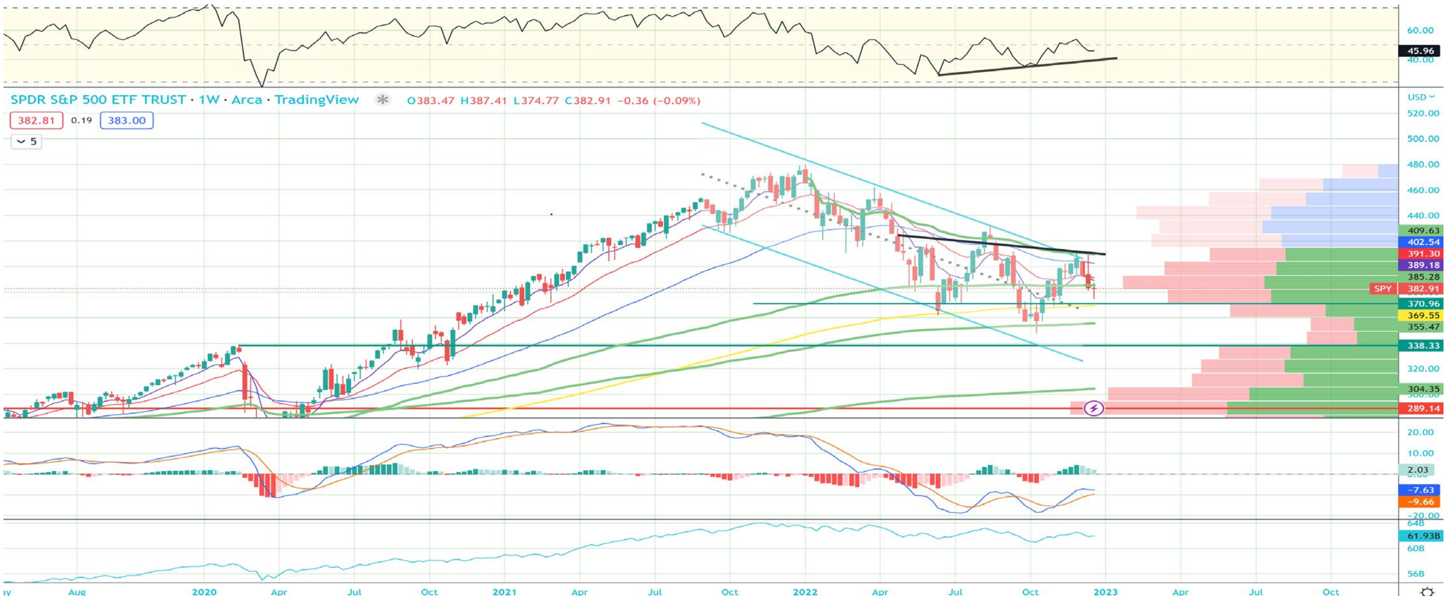
Overview Sections

OptionsHawk 2023 Top Stocks and Portfolios

Additional Sections

Quick Links to Sector/Industry Breakdown Sections

S&P 500 (SPX) Technical View and Analysis



Analysis: The S&P spent all of 2022 in a very uniform channel down pattern and in December failed at key channel resistance that also aligned with VWAP off the 2021 highs. Momentum has since shifted bearish along with breadth while weekly MACD is nearing a move back into bearish territory. The 200-week EMA aligns closely with a key volume node near 3700 as well as the channel midpoint and below that level likely sets up for at least a move back to the October lows while a return to the pre-Covid highs near 3380 aligns nicely with a volume pocket. The October low did defend a VWAP off the 2018 low and 55-month MA while the next key VWAP is off the 2016 low that comes into play way down to 3050 which is also the next key volume node of support and certainly not out of the question. The 3575/4125 downward range break also measures to a target of 3050. One bullish case can be made for the positive weekly RSI divergence and if an upward push carries the S&P through 4100 a large weekly inverse head and shoulders bottoming pattern can measure to a target of 4900.

Key Levels Table

Level	Description	Level	Description
5315	2021/2022 1.382% Extension	3893	34 Month MA
5122	2021/2022 1.236% Extension	3870	89 Day MA
4846	Upper Monthly Bollinger Band	3854	55 Day MA
4815	January 2022 High	3853	8 Day MA
4635	March 2022 High	3845	VWAP off 2020 Lows
4339	VWAP off January 2022 Highs	3831	13 Week MA
4325	August 2022 High	3755	Lower Daily Bollinger Band
4288	Upper Weekly Bollinger Band	3655	200 Week MA
4227	89 Week MA	3637	June 2022 Low
4220	VWAP off March 2022 Highs	3593	Lower Monthly Bollinger Band
4217	21 Month MA	3510	55 Month MA
4150	2021/2022 50% Retrace	3500	Lower Weekly Bollinger Band
4129	55 Week MA	3500	2020/2021 50% Retrace
4120	13 Month MA	3490	October 2022 Low
4118	Upper Daily Bollinger Band	3394	February 2020 High
4100	December 2022 High	3230	2009/2021 38.2% Retrace
4008	200 Day MA	3198	2020/2021 61.8% Retrace
3941	21 Day MA	3050	89 Month MA
3935	34 Day MA	3000	1H23 14 Year Trend Support
3924	8 Week MA	2740	2009/2021 50% Retrace
3923	34 Week MA	2508	144 Month MA
3914	8 Month MA	2450	April 2020 Reversal Low
3914	144 Week MA	2350	December 2018 Lows
3908	144 Day MA	2192	March 2020 Lows
3905	21 Week MA	3230	2009/2021 38.2% Retrace
3897	13 Day MA	2740	2009/2021 50% Retrace

Market Sentiment/Breadth, Macro Picture and Fundamental Analysis

Sentiment/Breadth

Sentiment measures tend to be good counter-indicators in that extreme pessimism likely bodes well for stocks going forward and vice versa. However, extreme optimism is a less effective indicator for identifying market tops than extreme pessimism is for timing market bottoms. Another means of gauging risk appetite is the measurement of stock-price momentum. But similar to sentiment, the breadth of momentum in stock prices provides much more powerful and timely indications of market reversal at a low than at a high, and widespread positive momentum (i.e. a high reading in this indicator) is rarely consistent with primary market tops. These indicators are often used as warrning signals and in combination with other readings are more actionable.

AAII Sentiment Survey

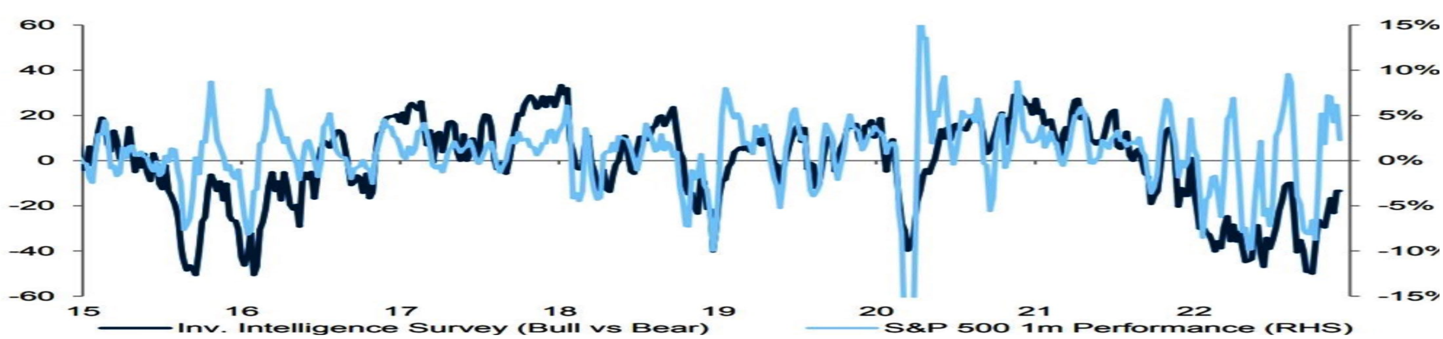
The AAII Investor Sentiment Survey measures the percentage of individual investors who are bullish, bearish, and neutral on the stock market for the next six months; individuals are polled from the ranks of the AAII membership on a weekly basis. The Bull-Bear spread is my preferred measure.

AAII Weekly Sentiment last came in at 20.3% Bullish and 52.3% Bearish, multi-week (9 weeks) high in pessimism and a large deviation from historical averages of 37.5% Bullish and 31% Bearish. Bears have outnumbered Bulls for 39 straight weeks, a new record.

The Investors Intelligence Survey

The Advisors Sentiment report surveys the market views of over 120 independent investment newsletters (those not affiliated with brokerage houses or mutual funds) and reports the findings as the percentage of advisors that are bullish, those bearish and those that expect a correction.

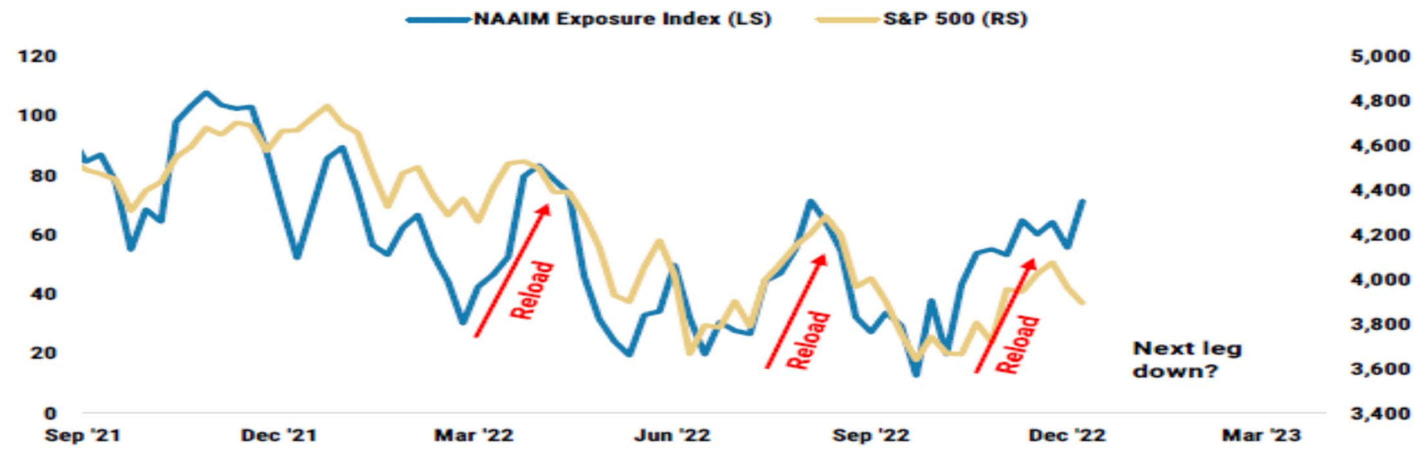
The US Investor Intelligence Survey at < 20% net bullish is in unusually extreme levels that has aligned with prior market bottoms.



NAAIM Exposure Index

NAAIM member firms who are active money managers are asked each week to provide a number which represents their overall equity exposure at the market close on a specific day of the week, currently Wednesdays. The NAAIM Exposure Index represents the average exposure to US Equity markets reported by members. The NAAIM Exposure Index provides insight into the actual adjustments active risk managers have made to client accounts over the past two weeks. NAAIM has been one of my preferred indicators to determine when to buy fear and sell greed

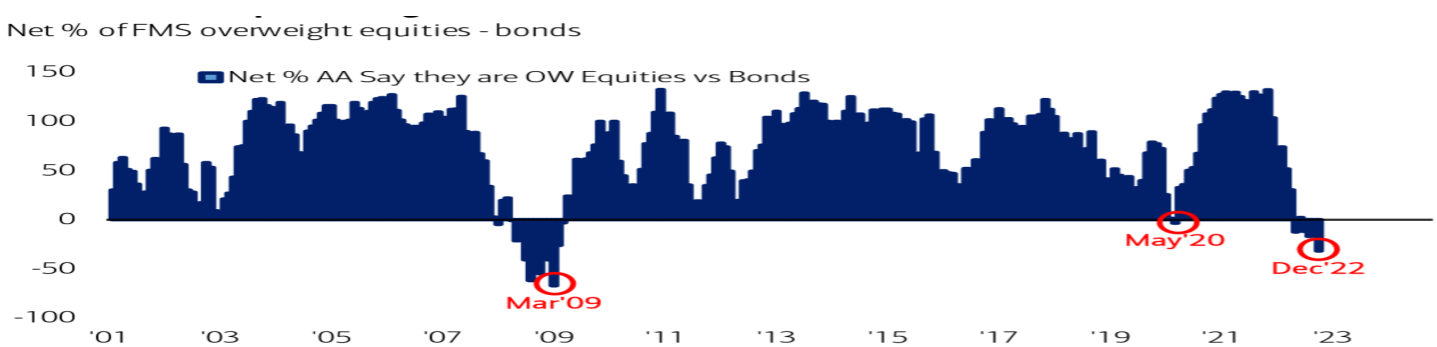
The NAAIM Exposure Index, after sitting above 60 for a few weeks saw an unusual sharp drop on the 12/21/2022 report to 39.35 and those steep drops have historically led to strong one-month forward returns. Conversely, the NAAIM getting above 60 has been a good time to sell into strength all year as it has climbed into Feed Meetings.



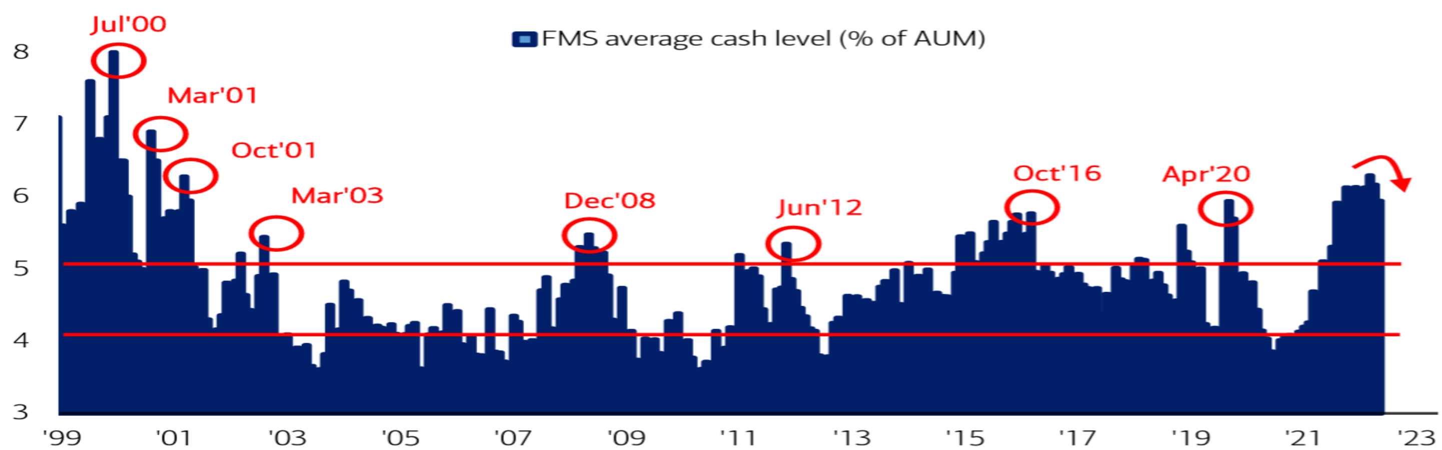
BAML Global Fund Manager Survey

The BAML global fund manager survey is a monthly report that canvasses the views of approximately 200 institutional, mutual and hedge fund managers around the world.

The December Fund Manager Survey showed investors bearish growth and bullish China reopening. CIO's want CEO's to focus on balance sheets (56%), not capex (21%) or stock buybacks (16%). A record 90% of investors predict lower global inflation in '23. Fed Funds are seen peaking at 5% in Q2 2023. FMS investors say the best performing asset in '23 to be government bonds & most overweight bonds vs stocks since April 2009. The net % of FMS investors expecting earnings to deteriorate worsened to 91% in Dec'22, up from 86% in Nov and in line with 91% in Oct. December FMS showed net 68% of investors saying a recession was likely in the next 12 months. FMS investors ' optimism on China growth outlook surged in Dec'22, with net 75% of FMS investors who now see a stronger Chinese economy in 2023. Expectation s for dollar depreciation highest since '06, driving investors to Emerging Markets.

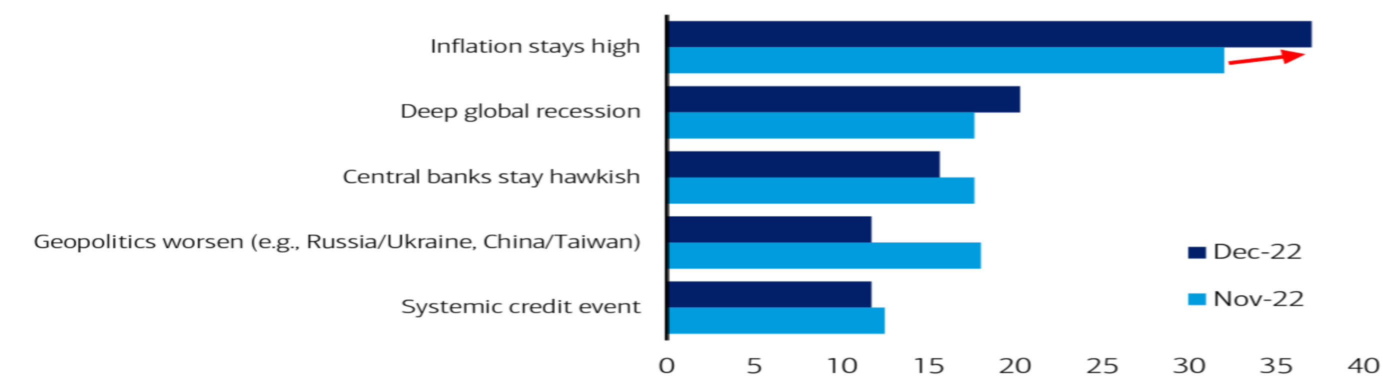


FMS average cash level (% of AUM)



We can see the largest tail risk remains sticky inflation which coincides with hawkish Central Banks while a deep global recession also remains a key risk.

What do you consider the biggest 'tail risk'?



Sell-Side Indicator

Wall Street's consensus equity allocation has been a reliable contrarian indicator over time. When the SSI has been this close or closer to a "Sell", the subsequent 12-month total return was 9%, positive 72% of the time vs. 83% positive returns overall.

The SSI has dropped over 6ppt YTD to 52.8%, closer to a "Buy" signal than a "Sell" signal but still in "Neutral" territory. This level implies price returns of +16.2% over the next 12 months. Historically, when the SSI was at current levels or lower, subsequent 12-month S&P 500 returns were positive 94% of the time (vs. 82% over the full history) and the median 12-month return was 22%.

US Consumer Confidence

U.S. consumer confidence rose to an eight-month high in December as inflation retreated and the labor market remained strong, but fears of a recession persisted, resulting in fewer households planning to make big-ticket purchases over the next six months. The Conference Board said its consumer confidence index increased to 108.3 this month, the highest reading since April, from 101.4 in November. Consumers' 12-month inflation expectations fell to 6.7%, the lowest since September 2021, from 7.1% last month. The present situation index, based on consumers' assessment of current business and labor market conditions, rose to 147.2 from 138.3 last month. The expectations index, based on consumers' short-term outlook for income, business, and labor market conditions, increased to 82.4 from 76.7.

US Economic Sentiment & CEO Confidence

The Bloomberg Consumer Comfort Index is produced by Langer Research Associates of New York. The Index has significant long-term correlations, including on a time-lagged basis, with a variety of key economic indicators. In addition to its three measures of current sentiment, the Consumer Comfort data include a monthly gauge of economic expectations, based on the share of Americans who say the economy is getting better, getting worse or staying the same.

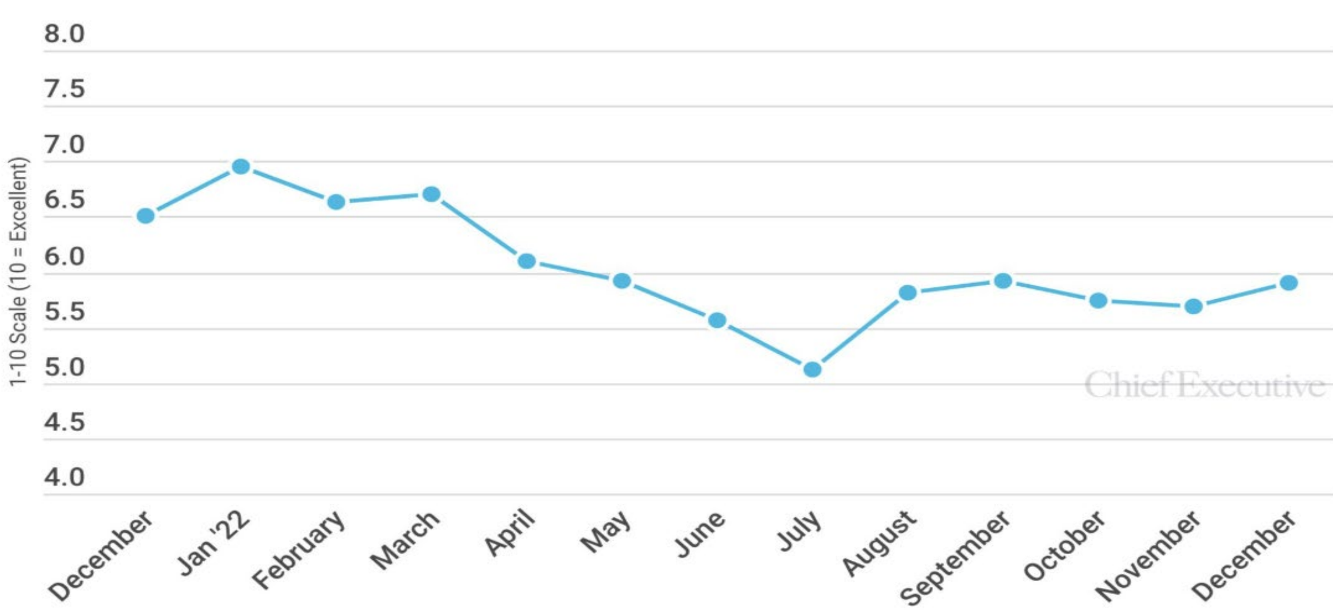
The US Economic Policy Uncertainty is based on newspapers in the United States. To measure policy-related economic uncertainty, it constructs an index from three types of underlying components. One component quantifies newspaper coverage of policy-related economic uncertainty. A second component reflects the number of federal tax code provisions set to expire in future years. The third component uses disagreement among economic forecasters as a proxy for uncertainty. A significant dynamic relationship exists between the economic policy uncertainty index and real macroeconomic variables. An increase in economic policy uncertainty as measured by the index foreshadows a decline in economic growth and employment in the following months.

Economic Policy Uncertainty

The CEO Confidence Index is America's largest monthly survey of chief executives. Each month, Chief Executive surveys CEOs across corporate America, at organizations of all types and sizes, compile the CEO Confidence Index data.

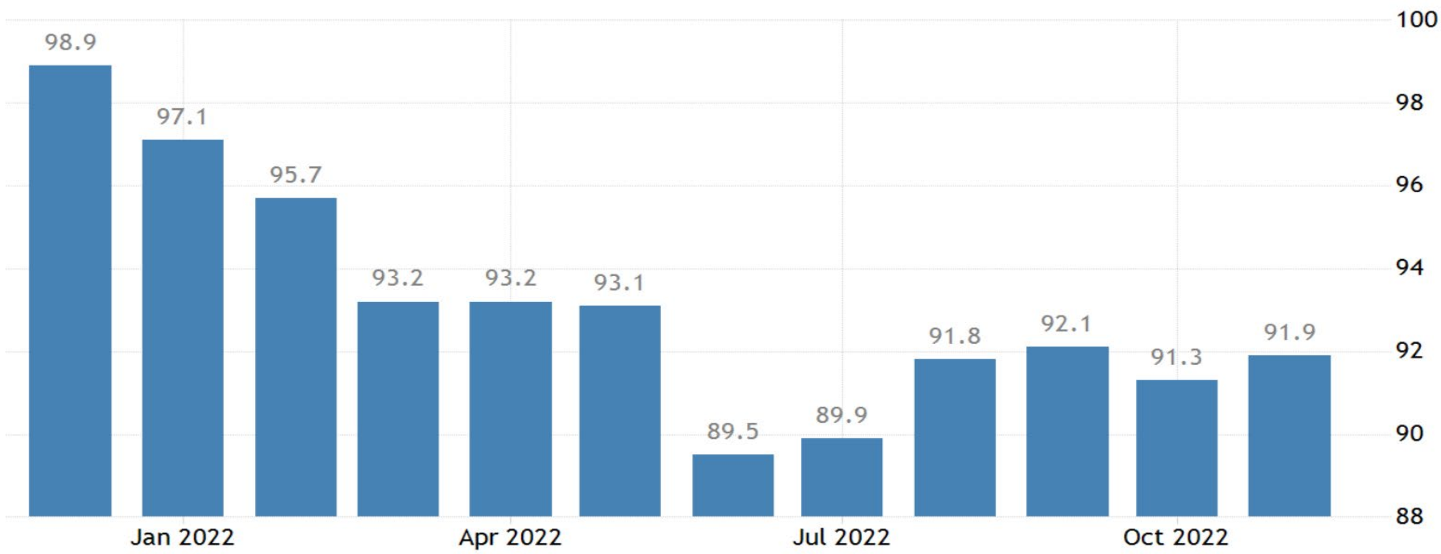
After two months of decreasing optimism, CEOs are once again looking to a brighter future by the end of 2023 and reflect that in their outlook for *Chief Executive*'s latest CEO Confidence Index. The leading indicator now stands at 5.9 on our 10-point scale, up almost 4 percent from the November reading, with America's chief executive's now projecting recovery and even growth by the end of 2023. The Index, which measures CEOs' assessment of U.S. business conditions for the 12 months to come, hit a decade low in July on fears of recession and concerns of inflation, including the current administration's ability to contain it, and has struggled to regain ground since. Many CEOs say that global and domestic uncertainty, coupled with stagflation and falling disposable income for consumers sets the stage for a challenging environment for business, at least in the first half of 2023.

CEO Forecast of Business Conditions 12 Months from Now



Small Business Optimism

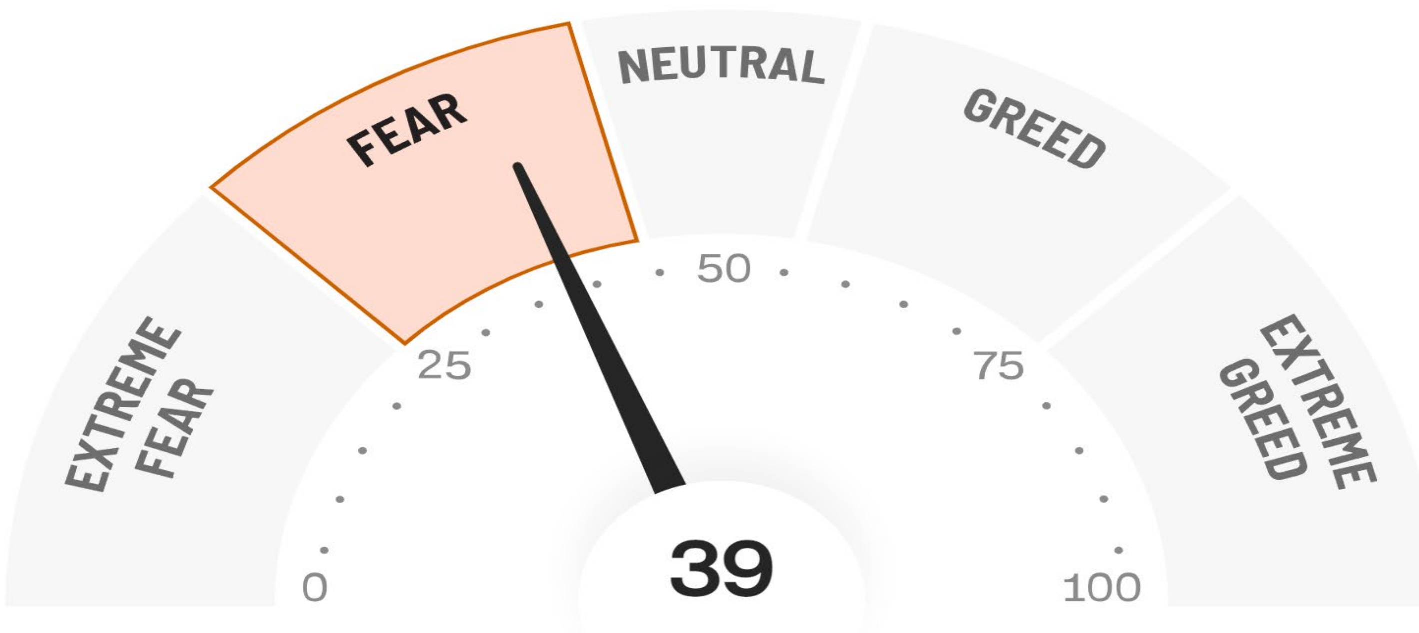
The NFIB Small Business Optimism Index in the United States unexpectedly increased to 91.9 in November of 2022 from 91.3 in October, beating forecasts of 90.4, amid a slight ease in inflation pressures and better business conditions over the next six months. "The small business economy is recovering as owners manage an ongoing labor shortage, supply-chain disruptions, and historic inflation" said William Dunkelberg, NFIB chief economist. However, inflation and worker shortages remained major issues for business owners and most of the readings were still consistent with a recession and weak economic activity.



Fear & Greed Sentiment Indicator

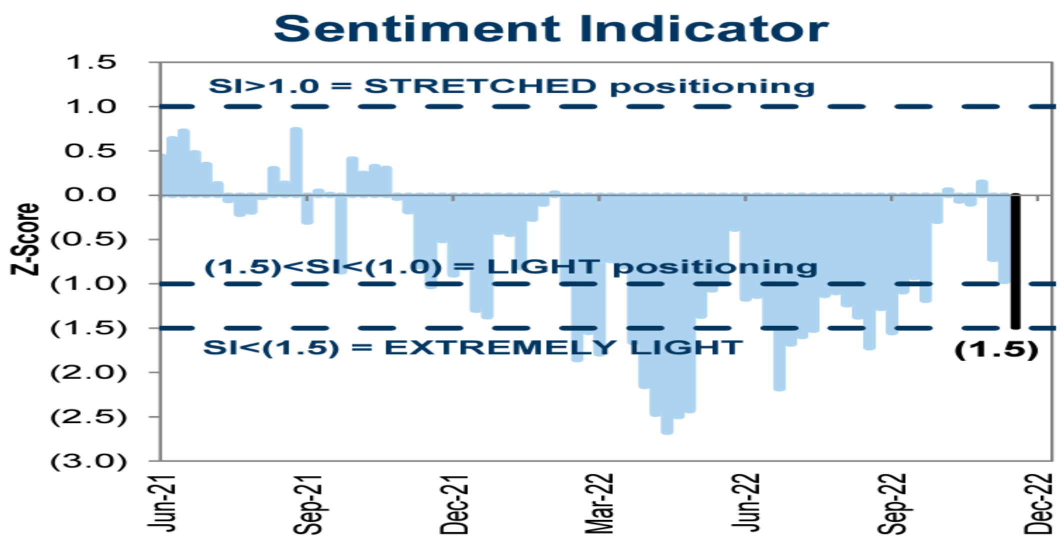
This is a gauge comprised of seven indicators: Momentum (S&P versus the 125-day moving average), Strength (stocks hitting 52-week highs and lows), Breadth (volume ratio of rising stocks to declining stocks), Options (put/call ratio), Junk Bonds (yield spread of investment grade and junk bonds), Volatility (VIX reading), and Safe Haven Demand (spread of stock returns to Treasuries).

The current reading of 39 indicates fear and compares to a Greed reading of 62 1-month ago.



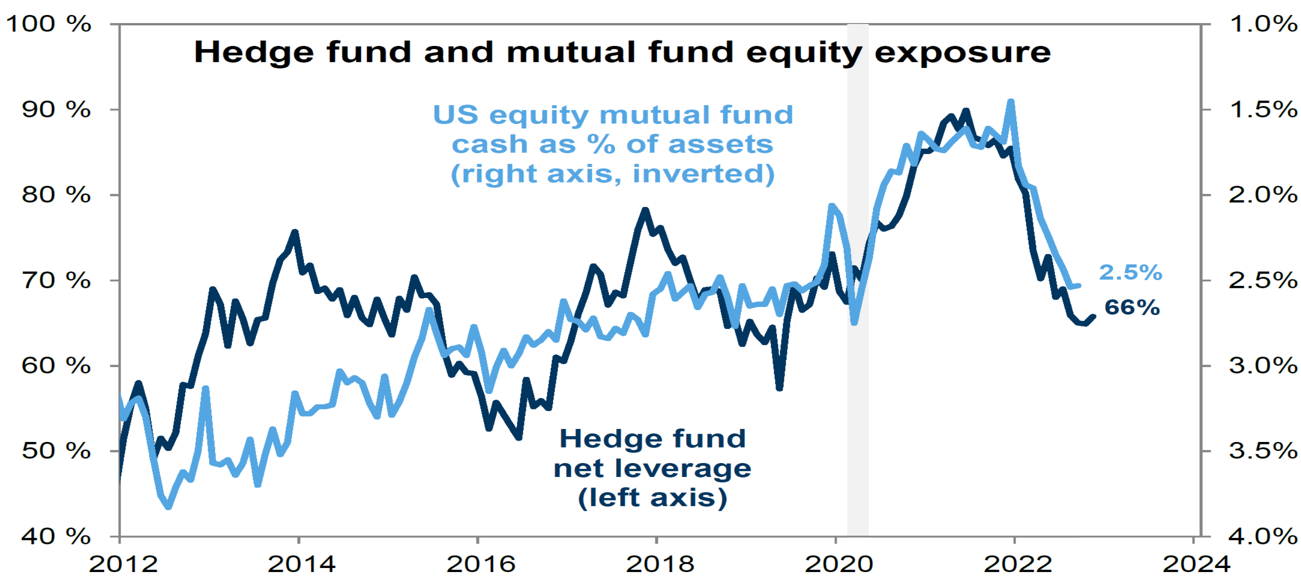
Goldman Sachs Sentiment Indicator

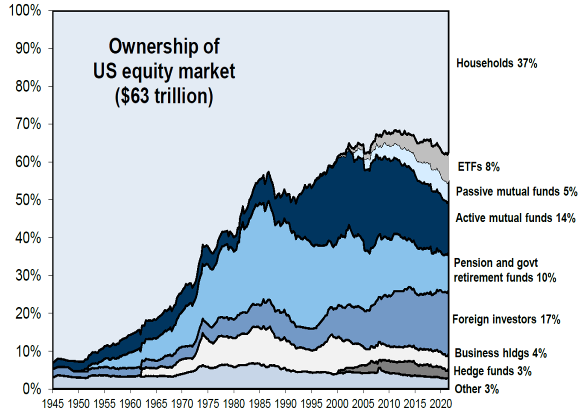
The GS Sentiment Indicator measures how far stock prices are outpacing fundamentals.



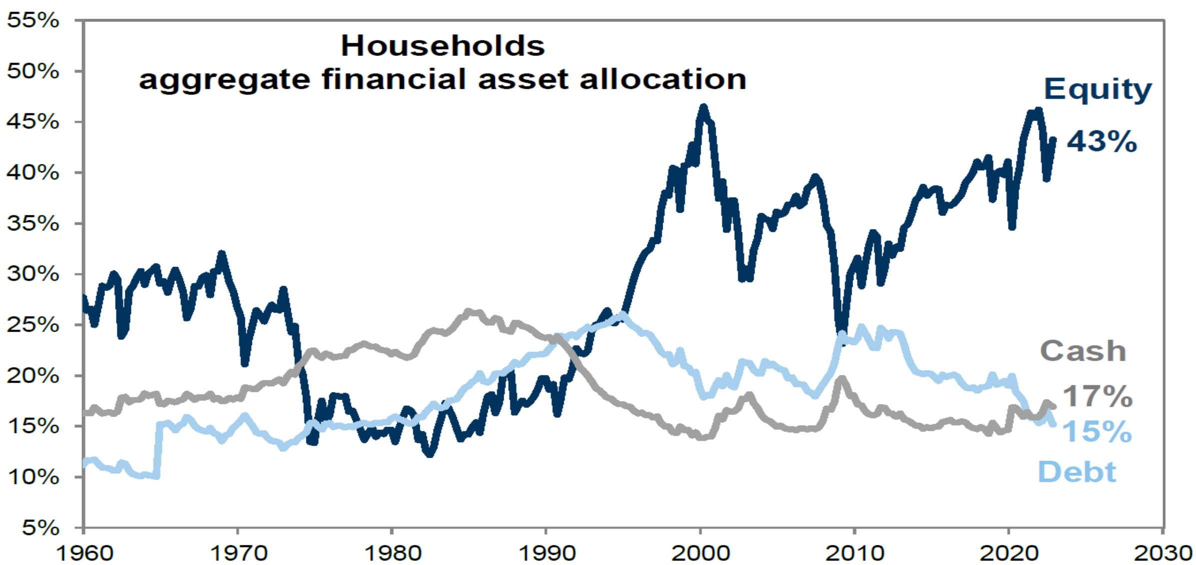
Fund Flows, Short Interest and Insider Trading

Relative to the past five years, institutional investors have de-risked sharply. Mutual fund cash balances since the start of the year have surged from 1.5% to 2.5% of assets, ranking in the 29th percentile vs. the past ten years. Hedge fund net leverage has dropped from 85% at the start of the year to 66%, ranking at the 17th percentile since 2017. The de-risking suggests that moves in the S&P 500 index will continue to be large, as low liquidity, short covering, and investor uncertainty about the path of monetary policy combine to exacerbate equity price action. In contrast with institutional investors, household equity allocations remain extremely elevated relative to history, posing a downside risk to equity valuations. Households are the largest holder of US equities, owning more than a third of the market directly and controlling another third indirectly through mutual funds, ETFs, and pension funds. Historically households have been net sellers of equities when growth is weak and the unemployment rate rises – both of which may happen in 2023. So far this year $131 billion has flowed *into* US equity mutual funds and ETFs while $206 billion has flowed out of US bonds and $55 billion has flowed out of money market funds. Households currently allocate 43% of their financial assets to equities which is well above the 28% average equity allocation since 1952. Households have a below-average allocation to credit (15%) and an average allocation to cash (17%).

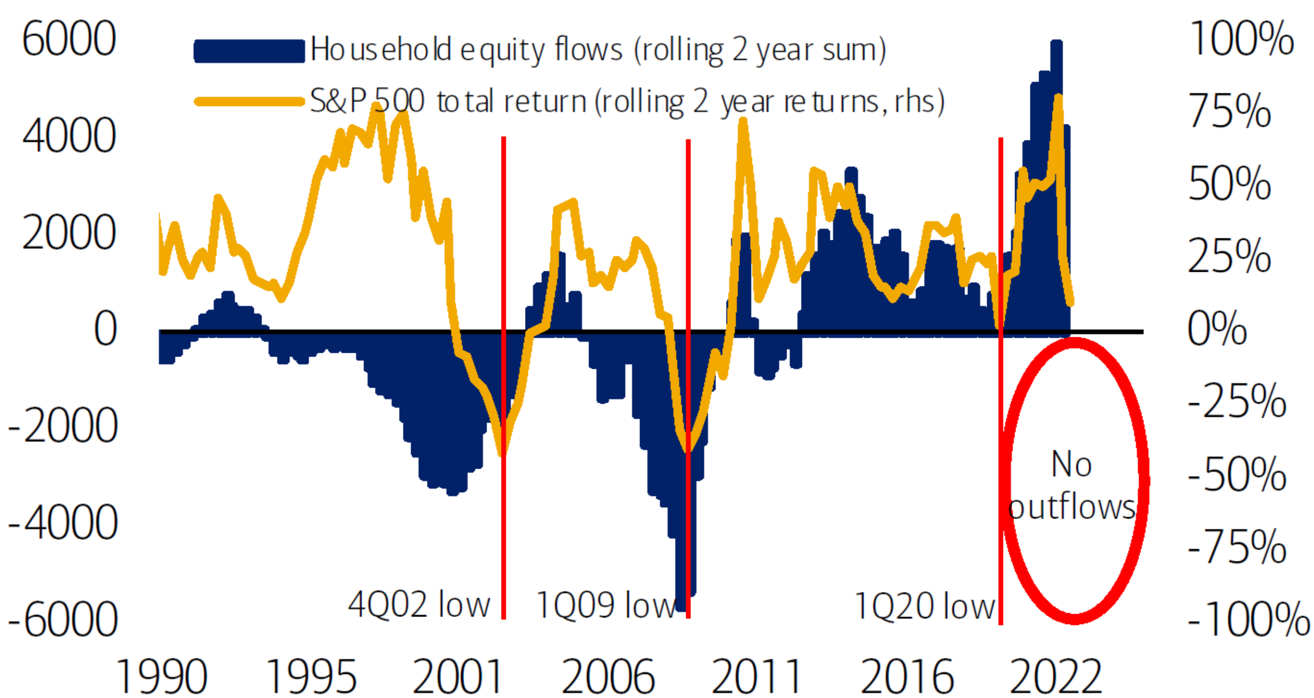




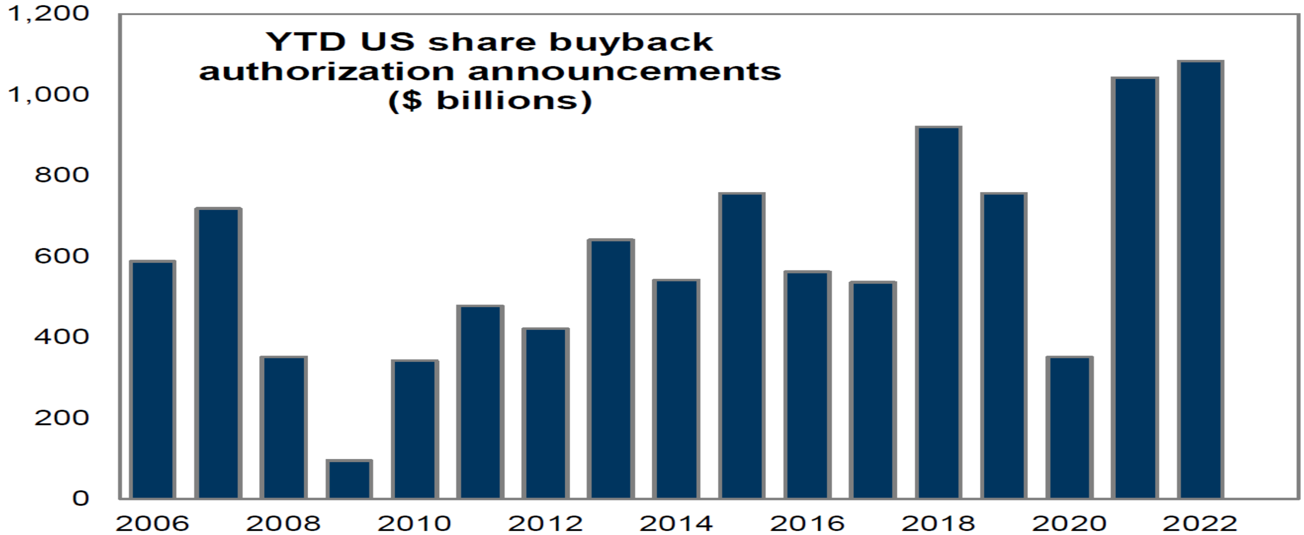
Category	Net US equity demand ($ billions) 2021	2022E	2023E
Corporations	$ 623	$ 700	$ 500
Households	448	100	(100)
Foreign Investors	(45)	100	(150)
Pension Funds	(223)	(100)	200
Mutual Funds	(317)	(350)	(200)
Life Insurance	(80)	-	-
Other	(49)	-	-
less			
Credit ETFs	203	150	200
Purchases of foreign stocks	155	300	50



US Household equity flows vs S&P 500 returns, $bn

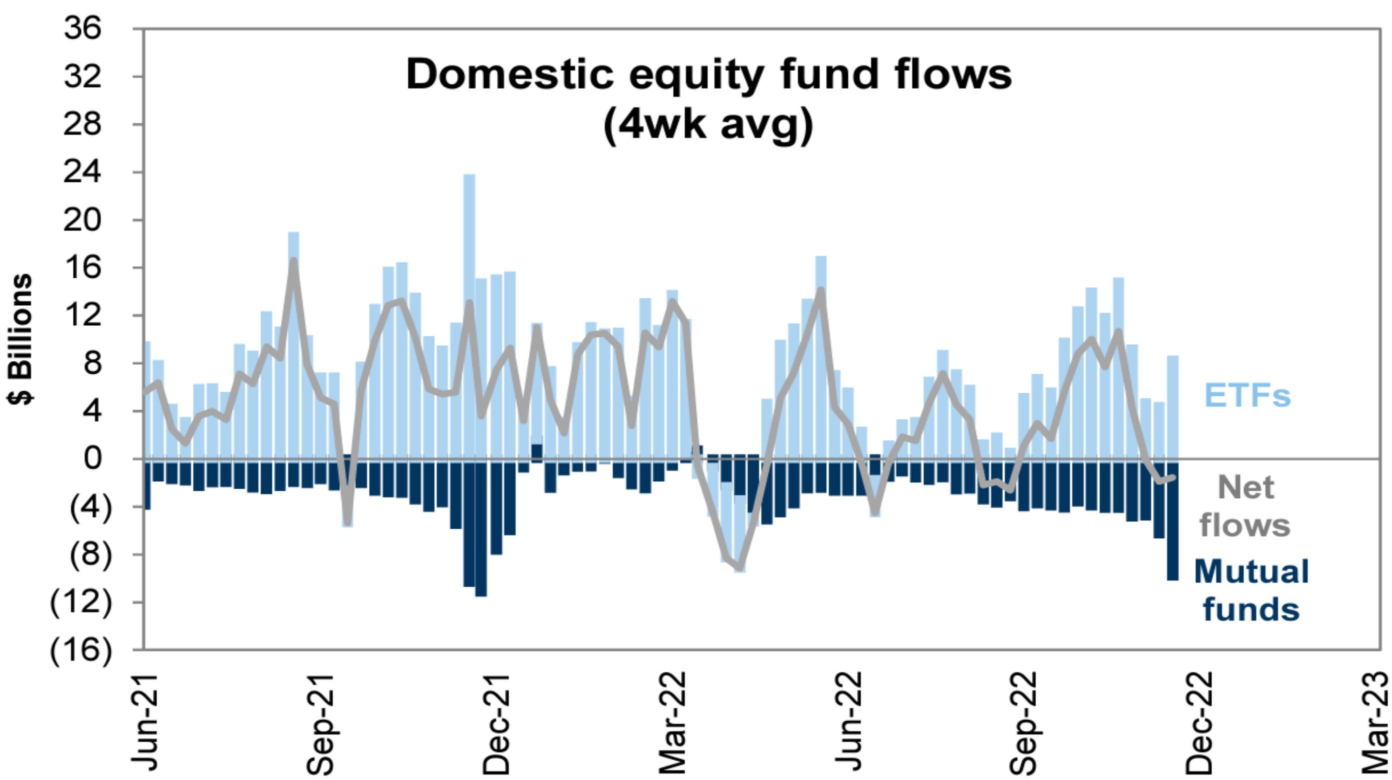


Buybacks have been the largest and most consistent source of demand for shares for more than 10 years but demand will soften in 2023. Repurchases are primarily a function of EPS growth and authorizations. Buyback authorizations are tracking above the record level of 2021. However, year/year growth in S&P 500 buyback completions has decelerated from +100% in 4Q 2021 to just +7% in 2Q 2022 and registered -10% in 3Q. S&P 500 firms in 2023 are forecasted to spend $869 billion on repurchasing shares, a year/year decline of 10%. In the four recessions since 1990, buybacks typically fell by 46%.

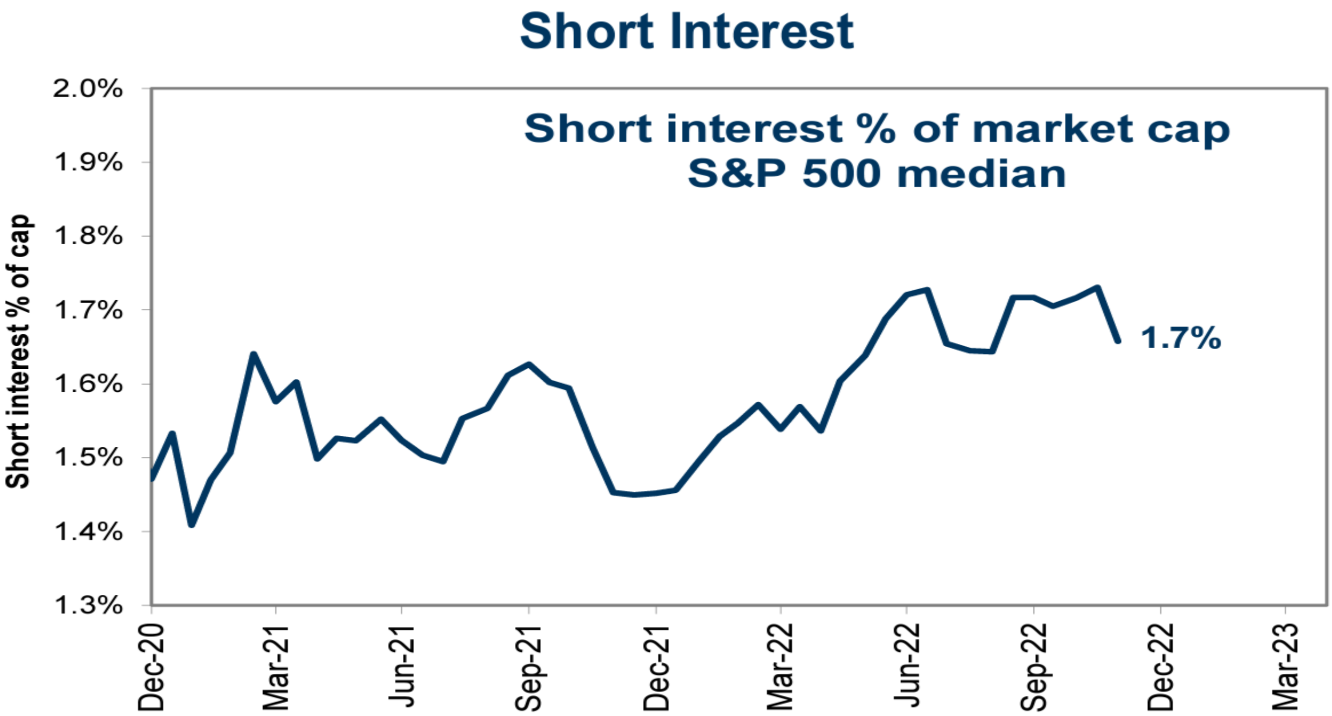


Fund Flows: Global equity funds have recorded their biggest weekly outflows since March 2020, hit by recession fears as central banks vow to keep interest rates higher to tame inflation. Data from Refinitiv Lipper showed a net withdrawal of $33.6 billion in the week to Dec. 21. Global bond funds also saw a net weekly outflow, of $14.1 billion, the biggest in more than two months. Money market funds recorded net sales of $41 billion.

Domestic equity fund flows

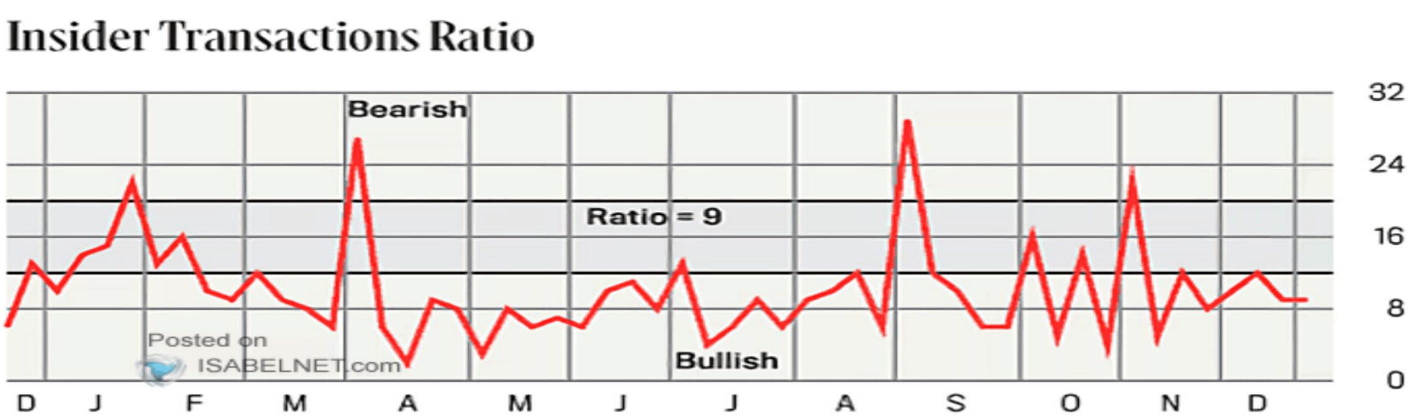


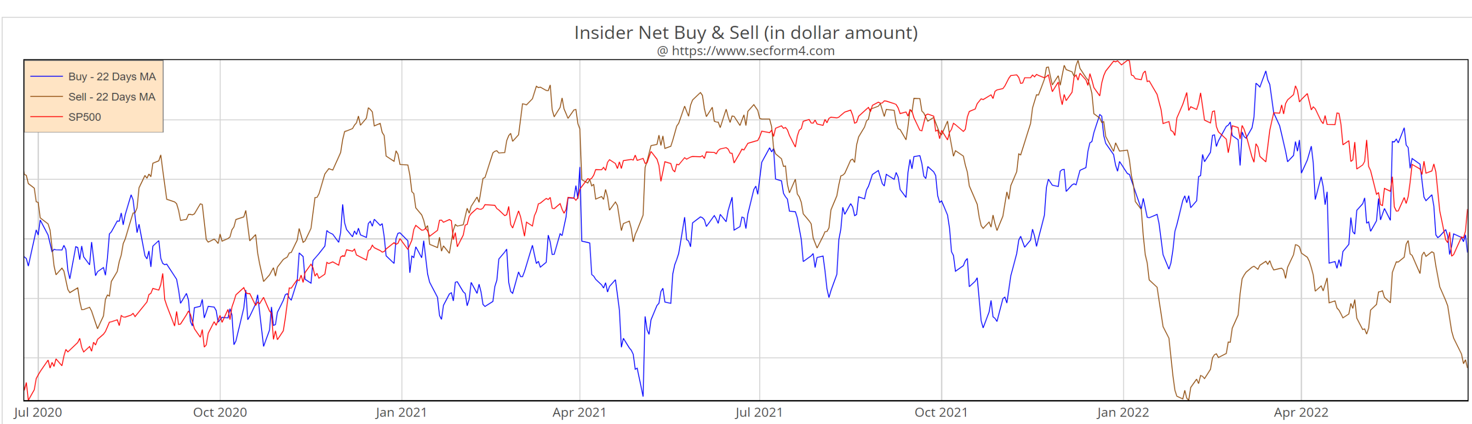
Short Interest



Insider Transaction Ratio

Insider activity is mainly only worth following on the buying side as management only buys its stock for one reason, expectations the stock is undervalued and heading higher, often being a key inflection point for a stock in a downtrend. Tracking insider selling provides very little value as management sells stock for a variety of reasons, and it provides little historical evidence of being a signal and often is a 10b5-1 plan.

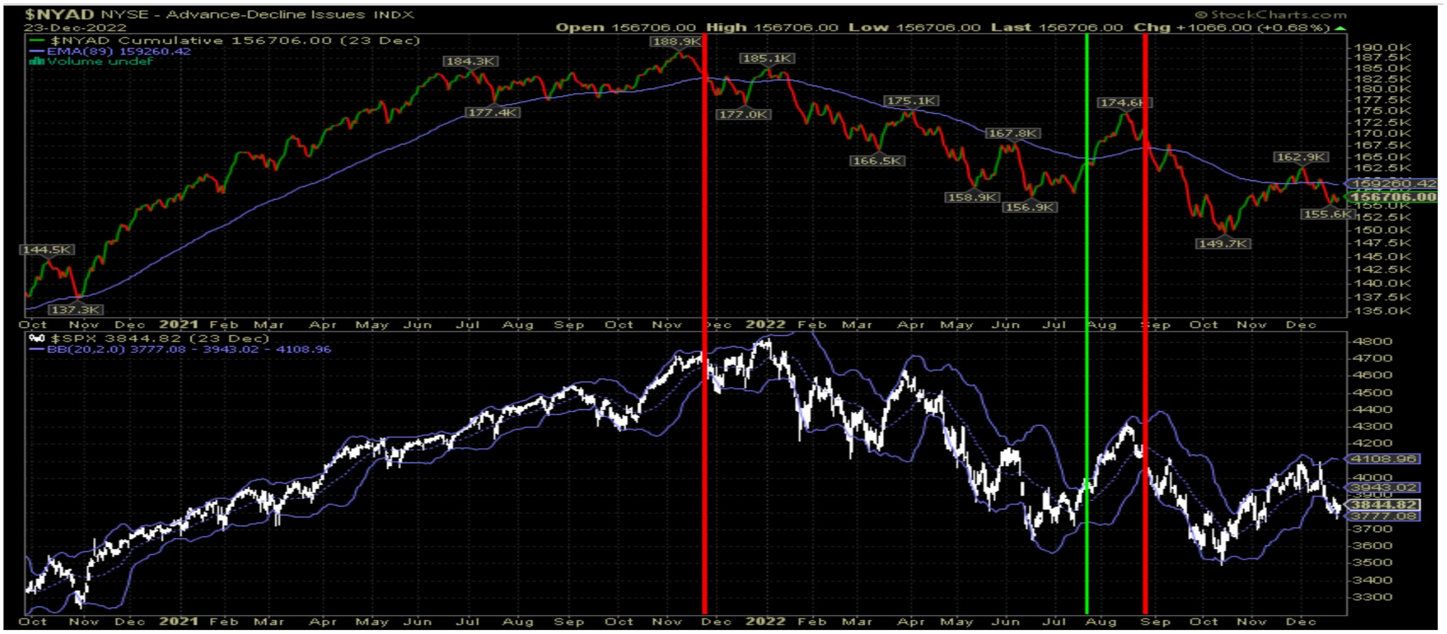




Breadth Readings

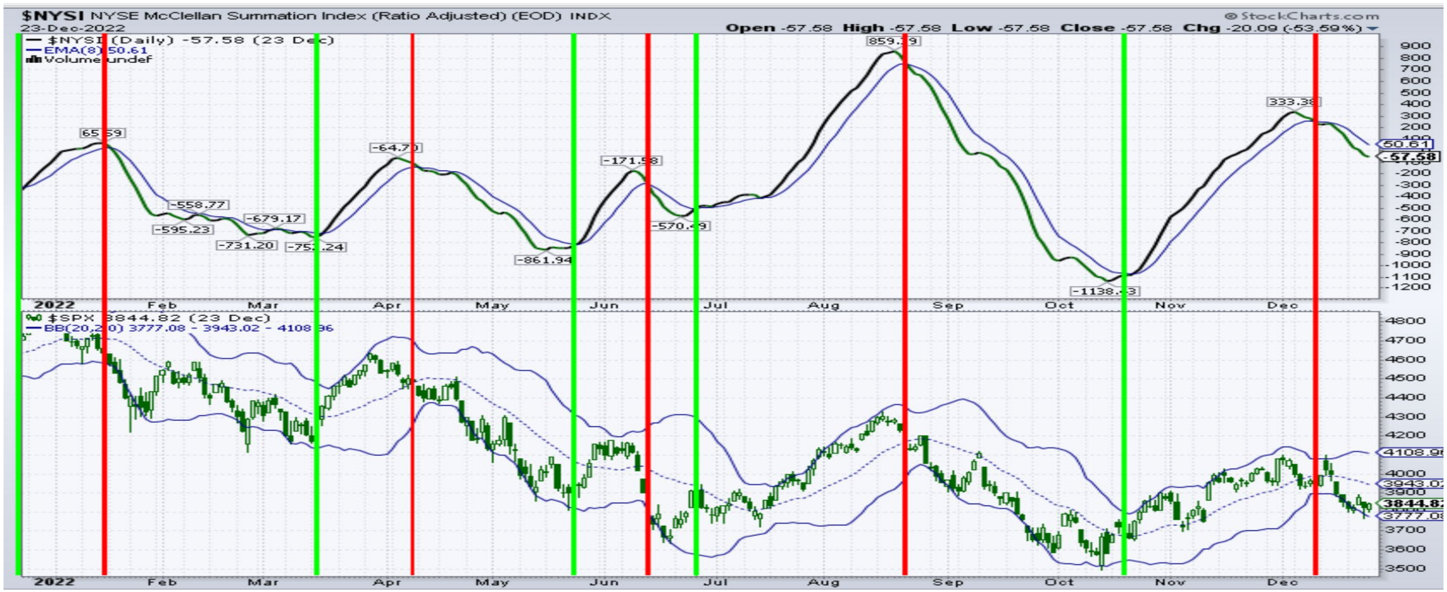
Below are a variety of the key breadth readings and some of the signals I utilize for market timing, and we are always developing more indicators.

NYSE Cumulative A/D – This is a key indictor for longer-term swing trading signals confirming rallies/sell-offs and the 89 EMA has been an effective level. Since breaking the 89-EMA in November 2021 it kept investors out of markets while catching a brief Summer rally and then moving back into sell-territory. There was a brief bull cross in November 2022 but has dipped back into the sell-zone.

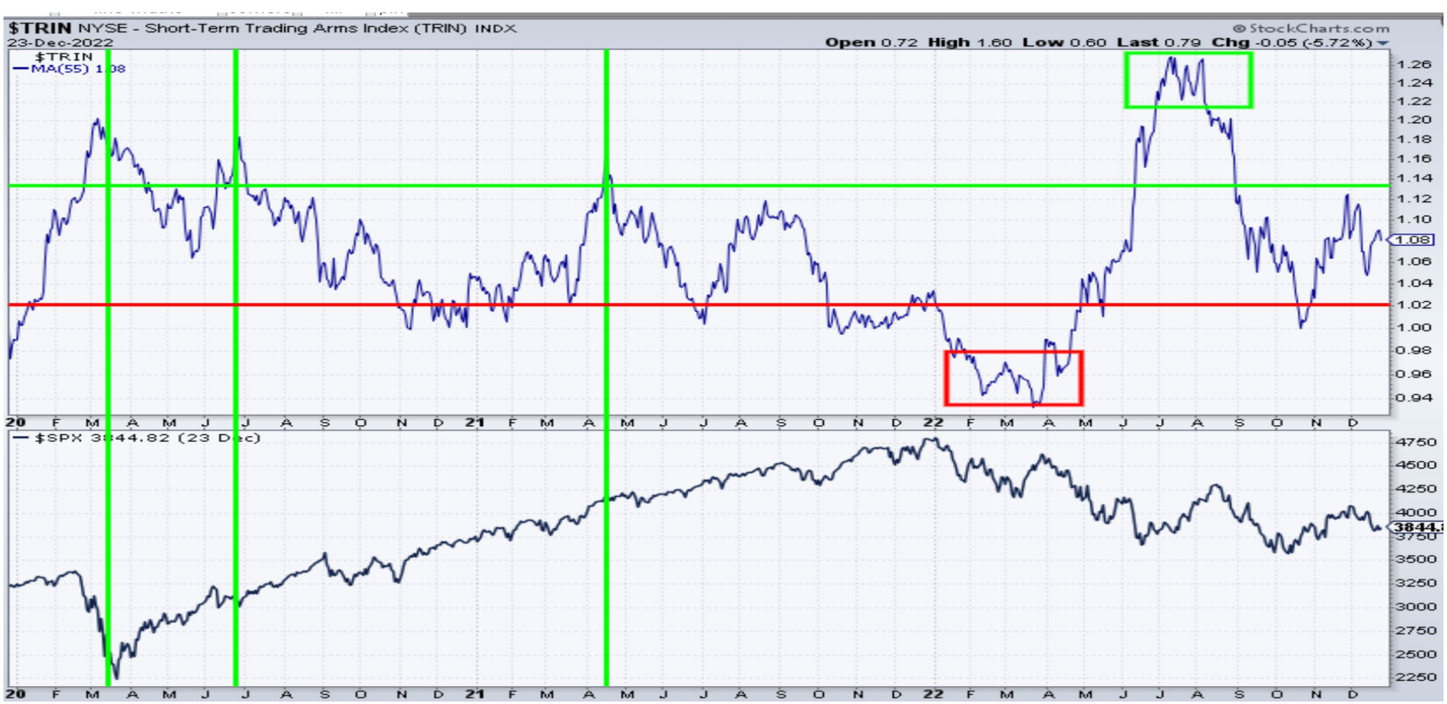


NYSE McClellan Oscillator (NYMO) – This indicator is useful for timing short term overbought and oversold extremes in combination with other indicators and sentiment measures. It mainly ranges in the -55 to +40 range and we are mainly looking for extreme readings for a strong signal. In the current bear-market readings above +50 have been a time to look at booking profits on the rallies while reading below -80 have coincided with tradable lows.

NYSE Summation Index (NYSI) – This indicator is another one to watch for divergences while a very simple but great signal over the years has been looking for 5- or 8-day EMA crossover, above is a buyers' market and below a sellers' market, the 8 day EMA signal shown below with vertical line triggers for buys (green) and sells (red). It's best used after a multi-week trend move in the indicator as a reversal signal. This has been by far one of the greatest signals I use for timing market moves. It is important to note that NYSI crosses rarely catch the perfect bottom and the bullish cross higher is often more of a confirmation signal of a trend inflection while bearish crosses are similar in not catching exact tops. Adhering to this indicator kept investors on the right side of the market consistently in 2022 with strong gains. After triggering a buy signal in late October leading to a great market rally off the lows the indicator switched back to a sell-signal in early December and remains there.



ARMS Index (TRIN) – This is another useful indicator for judging overbought and oversold conditions where I prefer using 55-day moving average to eliminate the daily noise. The 55-day MA has given rare signals but a sustained move above 1.13 for multiple days/weeks has been a general reading of oversold and correlated with key inflection bottoms while below 1.02 vice versa though less impactful. The indicator was a warning signal in early 2022 and then showed to be a buyer into lows in mid-2022 while currently in Neutral territory.

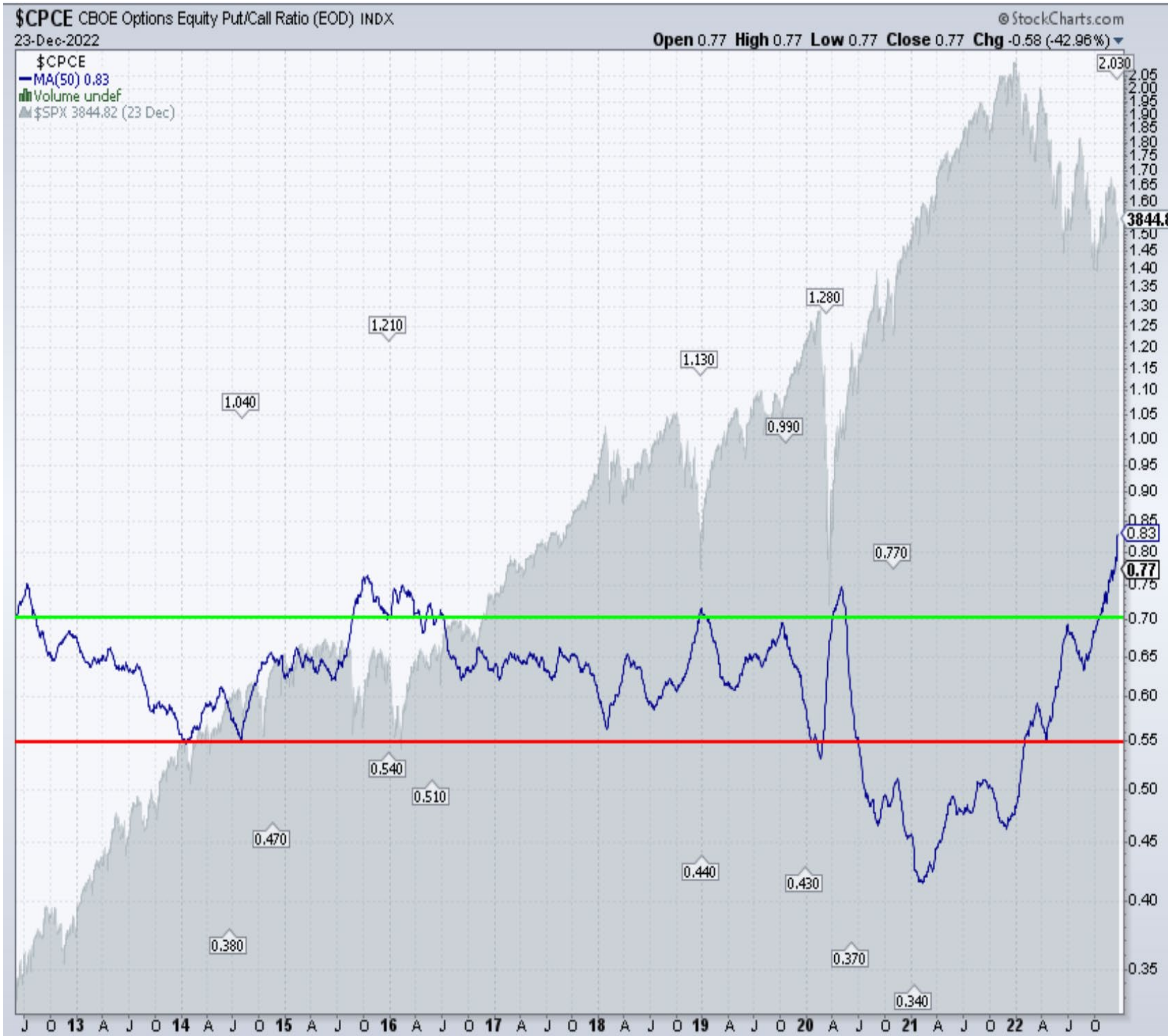


Moving Averages and Crossovers – The 8/21-week EMA crossover has long been a favorite signal for momentum in individual names and works with Indices. In general, you want to be long when the 8 week is above the 21 week and short (or neutral) when it is below with crossovers being key trend inflection signals. The 12-month moving average (MA) and monthly MACD are good longer-term risk management tools. The price action relative to the 200-week MA provides a good gauge for the health of the S&P 500's secular trend. Pullbacks or corrections (aka cyclical bear markets) for the S&P 500 that hold above or near the rising 200-week MA are a secular bull market pattern. Pullbacks that decisively break the 200-week MA are a sign of a secular bear market. Most corrections on the S&P 500 during the 1950-1966 and 1980-2000 secular bull market held between the 100-week MA and the 200-week MA. The 2015-2016 S&P 500 pullback fit this secular bull market correction pattern. The secular bear market periods from 1929-1950, 1966-1980, and 2000-2013 saw sustained periods below these long-term moving averages. This means that the 200-week MA provides a good secular bull market risk management tool or stop loss. Using this history as a guide suggests that the Ichimoku monthly cloud is a good trailing secular bull market stop loss. History also suggests that a decisive move below the monthly cloud confirms a secular bear market for US equities. For individual stocks I wrote a post in August showing the weekly MACD histogram (settings at 13/34/8) slows you to capture most of the upward trend moves while sitting out the sideways to lower moves.

The 8/21 weekly bear crossover triggered in late January 2022 and has been unable to cross back bullish all year long. After breaking below the 200-wek EMA briefly in September the S&P is back to being just above that key level. The recent rally failed right at the 12-month (52-week) moving average and sits at 4030 as a potential inflection level moving forward while the 8 and 21 week EMAs are converging with potential to inflect positively.

Volatility and Options Sentiment

CBOE Equity Put/Call: This indicator is weak due to its constant changing and overall fallacies such as not accounting for opening/closing nor initiated via a buyer or seller when opening. It has about a dozen flaws and suggest not paying much attention to put/call ratios as it assigns more value to 10,000 contracts of a $0.05 contract whether opening or closing, as it does to 2500 contracts of a $10 contract. We are also in an unprecedented era for options trading with the options market now surpassing the equity market and the added flexibility of weeklies and narrow strike ranges is increasing liquidity. You can utilize longer term moving averages of the ratio to smooth out the data and come away with some perspectives. Like most sentiment indicators it is more effective signaling bottoms than it is for signaling tops with a move above 0.7 for the 50-day moving average of Equity Put/Call a solid signal to buy the fear. With markets more short-term in nature these days one can looking at shorter timeframe moving averages to generate more signals, though fewer effective ones. Even the longer-term smoothing version of this indicator is now unreliable due to a surge of interest rate arbitrage trades with deep ITM puts which is skewing the data so please ignore all these posts about a record high put/call ratio.



CBOE Skew: The skewness of a rate of return indicates returns around 0. Negative skewness entails The CBOESKEW Index (SKEW) estimates the skewness of S&P 500® returns at the end of a 30-day horizon. Similar to VIX® the price of S&P 500 tail risk is calculated from the prices of S&P 500 out-of-the-money options. SKEW typically ranges from 100 to 150. To get a sense of what high or very high tail risk means, one can translate the value of SKEW to a risk-adjusted probability that the one-month S&P 500 log-return falls two or three standard deviations below the mean, and use VIX as an indicator of the magnitude of the standard deviation. When SKEW is equal to 100, the distribution of S&P 500 log-returns is normal, and the probability of returns two standard deviations below or above the mean is 4.6% (2.3% on each side); the probability decreases to .3% (.15% on each side) for three standard deviations. For a non-normal distribution, comparable probabilities are approximated by adding a skewness term to the normal distribution. This indicator gives a lot more noise than signal.

VIX:VXV Ratio: This is a great indicator of market fear, when moving above the 1 level generally indicative of an overly fearful environment though always best to let price-action confirm. This indicator worked very well in 2022 for signaling a tradable bottom bounce.

VIX Call Volume: VIX call volume above 1M has tended to be a signal of extreme fear signal. In 2022 the VIX peaked and markets bottomed each time we hit the 1M volume threshold.

Momentum tends to outperform when the VIX index stays under 25, otherwise momentum tends to underperform.

Table 18: Rule of 25: buy momentum when VIX<25

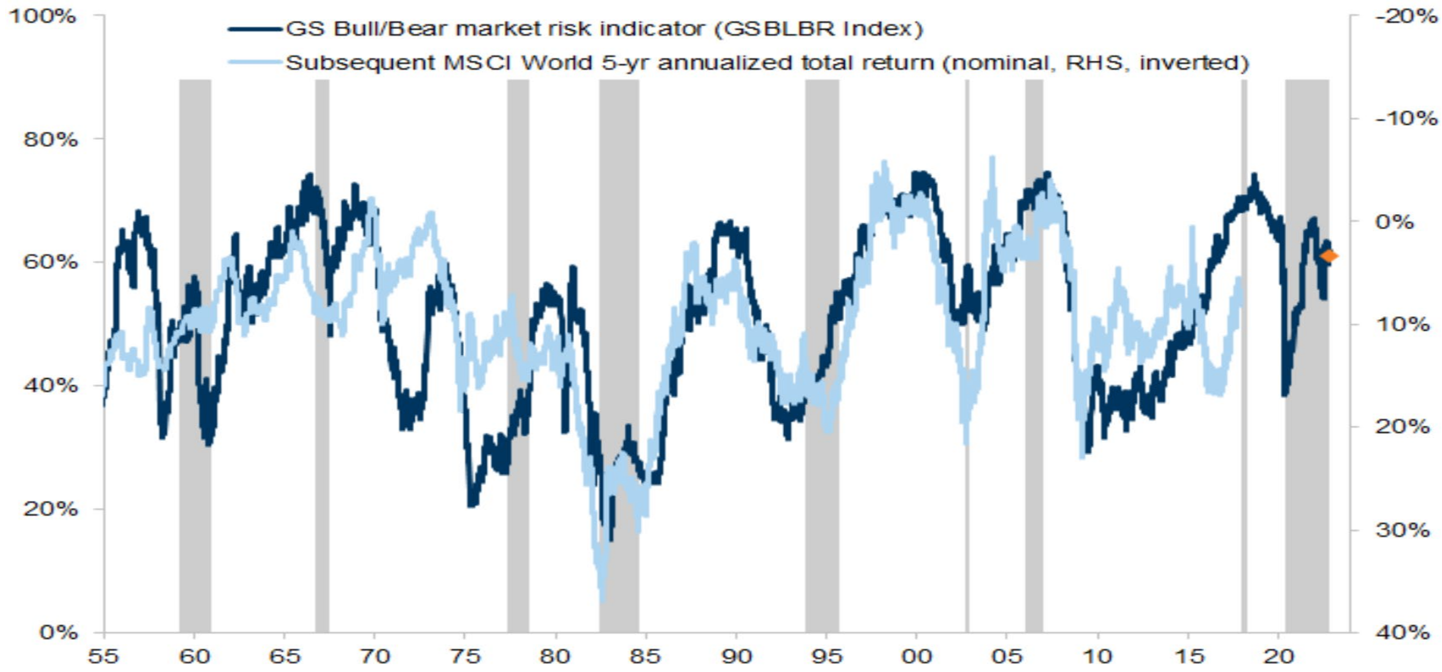
Avg. 1m relative returns vs. equal-wtd. S&P 500, 1990-10/2018

Momentum Factor	VIX > 25	VIX < 25
30wk/75wk MA	-1.1%	0.5%
5wk/30wk MA	-0.5%	0.3%
10wk/40wk MA	-1.0%	0.4%
200 day Price to MA	-0.7%	0.3%
Price Return - 12-mth Perf.	-1.0%	0.5%
Price Return - 9-mth Perf.	-1.1%	0.5%
Price Return - 3-mth Perf.	-0.3%	0.2%
Price Return - 11-mth Perf.	-1.1%	0.5%
Price Return - 12-mth and 1-mth Perf.	-0.7%	0.2%
Price Return - 12-mth and 1-mth Reversal	-0.9%	0.5%
Average:	**-0.9%**	**0.4%**
Median	**-0.9%**	**0.4%**

Goldman Sachs Bear Market Indicator

Goldman's bear market indicator — which considers the unemployment rate, manufacturing data, core inflation, the term structure of the yield curve and stock valuation based on the Shiller PE ratio — is at a rare 73 percent, its highest level since the late 1960s and early 1970s. Historically, when the Indicator rises above 60 percent it is a good signal to investors to turn cautious, or at the very least recognize that a correction followed by a rally is more likely to be followed by a bear market than when these indicators are low. It sees three things pointing to a sustained bear market: 1) The growth/inflation mix is turning against equity returns; 2) A sharp decline is often followed by a bounce; 3) The GS Bear Market Risk Indicator is at elevated levels.

GS Bull/Bear indicator and subsequent 5-year annualised total returns of MSCI World; shaded area: bear markets



BAML Bear Market Signposts

The 80% threshold suggests at least four more indicators need to get triggered for a Buy signal. The Fed always cut rates before the market bottomed. On average, the market bottomed 11 months after the Fed cut. However, pivot might be enough this time given the S&P 500 is much longer duration today. Historical market bottoms have occurred after the equity risk premium (ERP) rose by more than 75bps. As of October-end, the ERP stood at a 4-year low. Assuming current real rates of 1.5%, a 75bp increase in the ERP would imply 3500 on the S&P 500. The Sell Side Indicator has been a reliable contrary indicator and has been inching towards the Buy signal. The market always bottomed when the sum of CPI and trailing P/E was below 20. The current trailing P/E of 17.6x suggests inflation has to fall below 2.4%, which is unlikely in the near term. Early signs of macro improvement occur before market bottoms. Q3 2023 likely marks the bottom in Y/Y GDP change and PMI bottoms.

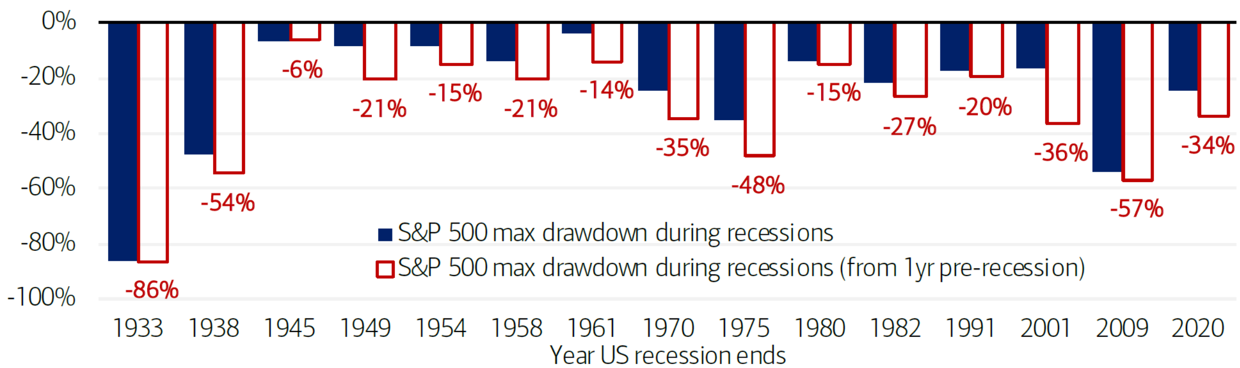
Signpost	Sep-74	Jul-82	Nov-87	Oct-90	Sep-02	Feb-09	Mar-20	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22
Fed cutting rates (prior 12m)	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Unemployment rates rise (vs. 12-mo. low)	☑	☑	☐	☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☑	☐	☑
More bears than bulls (AAII)			☐	☑	☑	☑	☑	☑	☑	☐	☑	☑	☑	☑	☑	☑	☑
ERP increases by >75bps vs. 12-mo. low	☑	☑	☑	☑	☑	☑	☑	☑	☑	☐	☑	☑	☐	☐	☐	☐	☐
50bps+ decline in the 2-yr yield (vs. 6-mo. high)		☑	☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sell Side Indicator Buy Signal (prior 3m)			☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yield curve steepens (vs. 6-mo. low)		☑	☑	☑	☑	☑	☑	☐	☐	☐	☑	☑	☑	☐	☐	☐	☑
5% bear market rallies (prior 3m)	☑	☐	☑	☐	☑	☑	☑	☐	☑	☑	☑	☑	☑	☑	☑	☑	☑
Rule of 20	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
PMI improves (vs. 12-mo. YoY low)	☐	☑	☑	☑	☑	☑	☑	☐	☐	☐	☑	☑	☐	☑	☑	☐	☐
% triggered	83%	88%	80%	90%	90%	100%	90%	30%	30%	10%	50%	50%	30%	30%	40%	20%	40%
S&P 500	64	107	230	304	815	735	2585	4516	4374	4530	4132	4132	3785	4130	3955	3586	3872

Macroeconomic and Fundamental

Global growth slowed through 2022 on a diminishing reopening boost, fiscal and monetary tightening, China's Covid restrictions and property slump, and the Russia-Ukraine war. Forecasts call for 1.8% global growth in 2023 as US resilience contrasts with a European recession and a bumpy reopening in China.

The two big uncertainties—whether inflation will slow sufficiently and whether the US economy can avoid recession in the process—are likely to remain the dominant focus in the coming months. Corporates and consumers are less exposed to credit and leverage risk than they have been historically, which could mitigate earnings risk considerably. But healthier consumer balance sheets means the Fed may have to hike longer. Like consumers, US corporates have largely shifted to longer-dated fixed rate debt – today over 75% of S&P 500 debt is long-term fixed vs. 40% in 2007. The average maturity of debt on S&P 500 balance sheets today is 11 years vs. 7 years in 2007. The market has never bottomed ahead of a recession and tends to bottom six months before the end of a recession.

The S&P saw drawdowns of over 20% around 7 of the last 8 recessions. And in almost all recessions since 1929, most of the max drawdown took place during the actual recession, and not in the 12m prior.



GDP Growth Outlook:

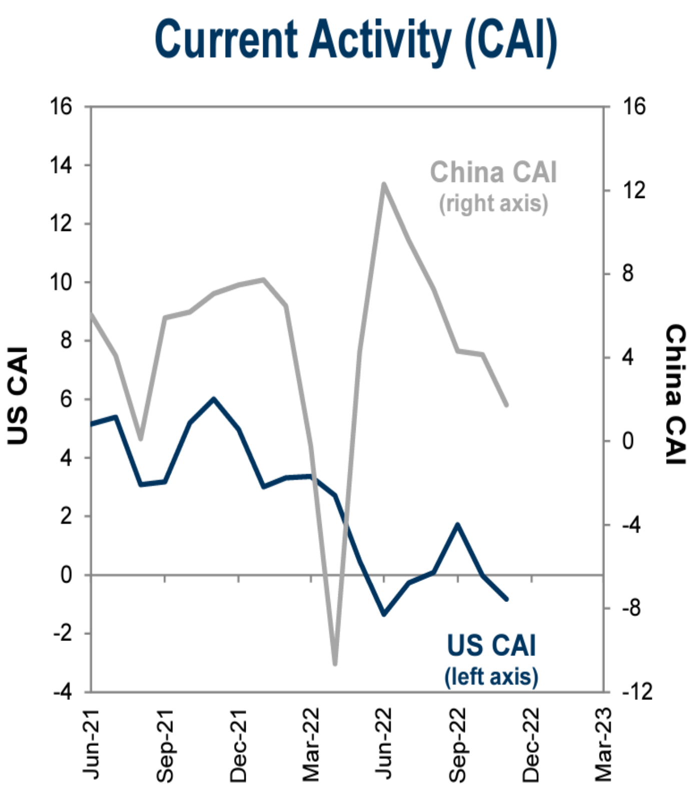
	2022		2023		2024	
	GDP	CPI	GDP	CPI	GDP	CPI
Global	3.3	8.5	2.3	6.4	3.2	4.4
US	1.8	8.1	-0.4	4.4	0.9	2.5
Euro Area	3.3	8.5	0.0	5.6	0.9	2.0
China	3.0	2.1	5.5	2.0	6.5	3.5
Developed Markets	2.5	7.5	-0.1	4.8	0.9	2.3
Emerging Markets	3.9	9.2	3.8	7.4	4.7	5.9
Emerging Asia	4.2	3.7	5.2	3.2	5.6	3.5
Emerging EMEA	3.1	22.5	1.1	16	3.3	10.2
Latin America	3.7	15.9	1.0	16.1	2.1	11.5

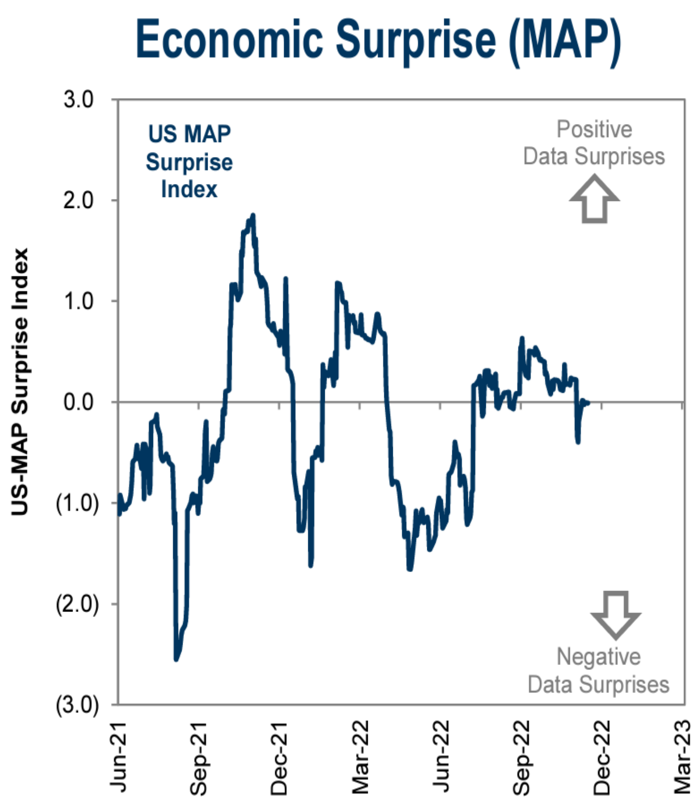
On the goods side, the ongoing rotation from goods to services spending, healing supply chains, and rebounding inventory levels should put downward pressure on core goods prices. On the services side, asking rents on new leases have decelerated sharply after the one-time jump in rents related to the work from home-related increase in demand for space.

Citi Economic Surprise Index

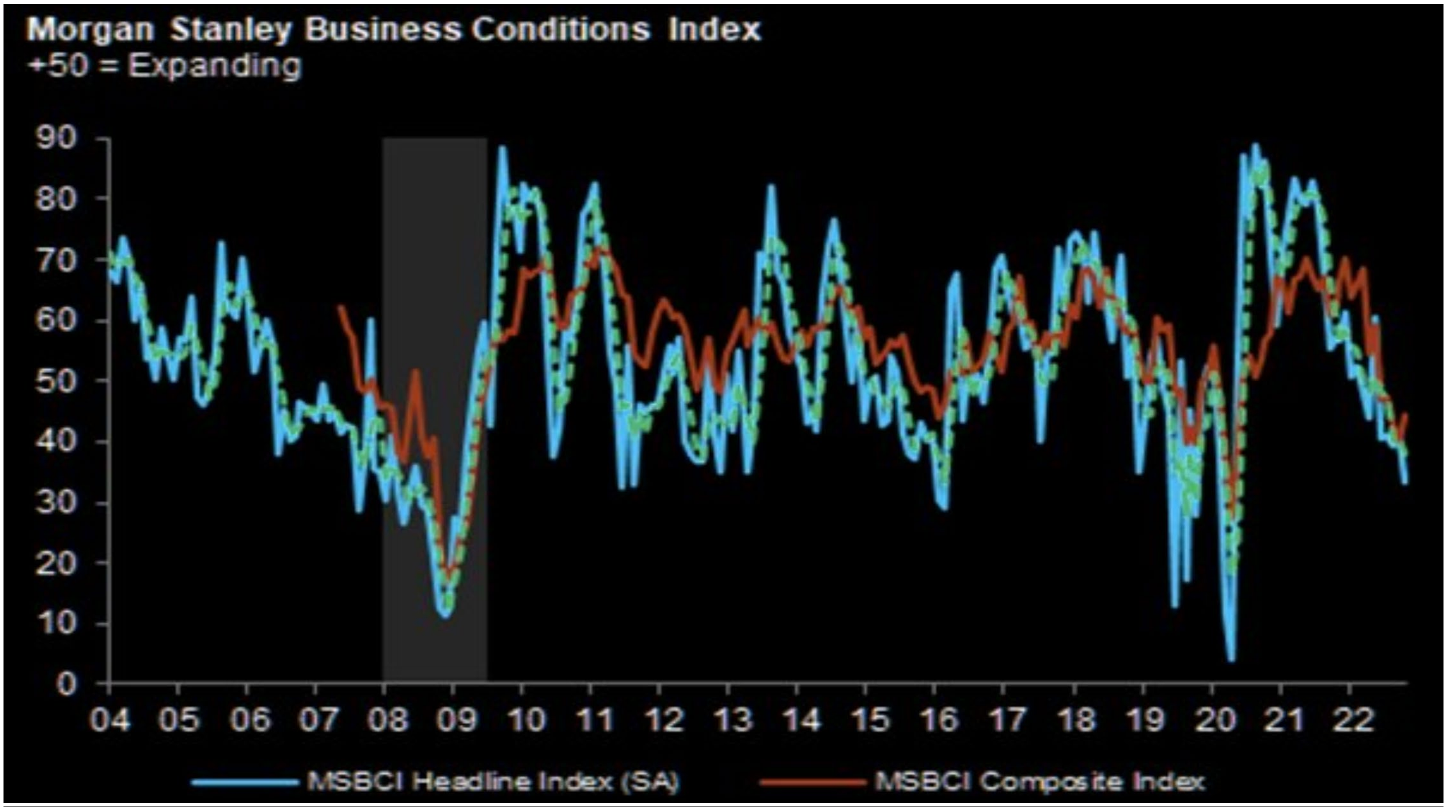
This index tracks how economic data is coming in relative to the forecasts. The Citigroup Economic Surprise Indices are objective and quantitative measures of economic news. They are defined as weighted historical standard deviations of data surprises (actual releases vs Bloomberg survey median). A positive reading of the Economic Surprise Index suggests that economic releases have on balance [been] beating consensus. The indices are calculated daily in a rolling three-month window. The weights of economic indicators are derived from relative high-frequency spot FX impacts of 1 standard deviation data surprises. The indices also employ a time decay function to replicate the limited memory of markets.

Goldman Current Activity and Economic Surprise

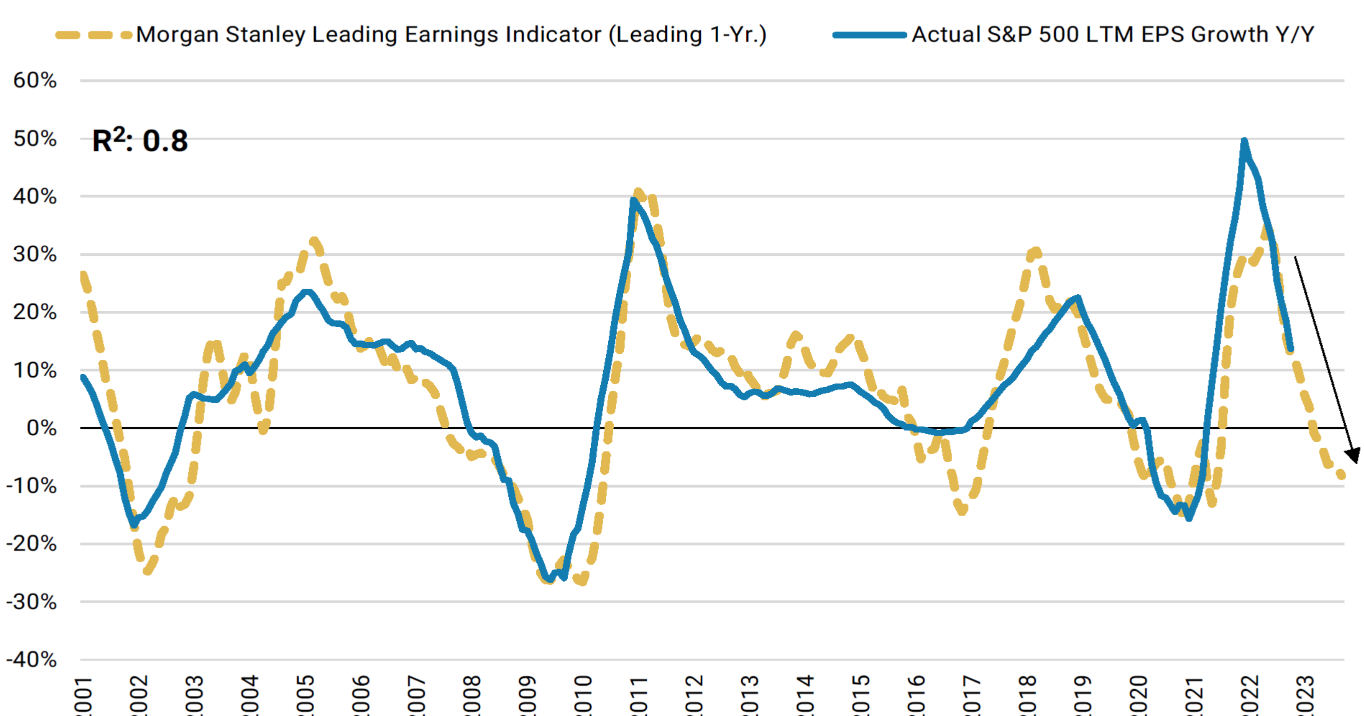


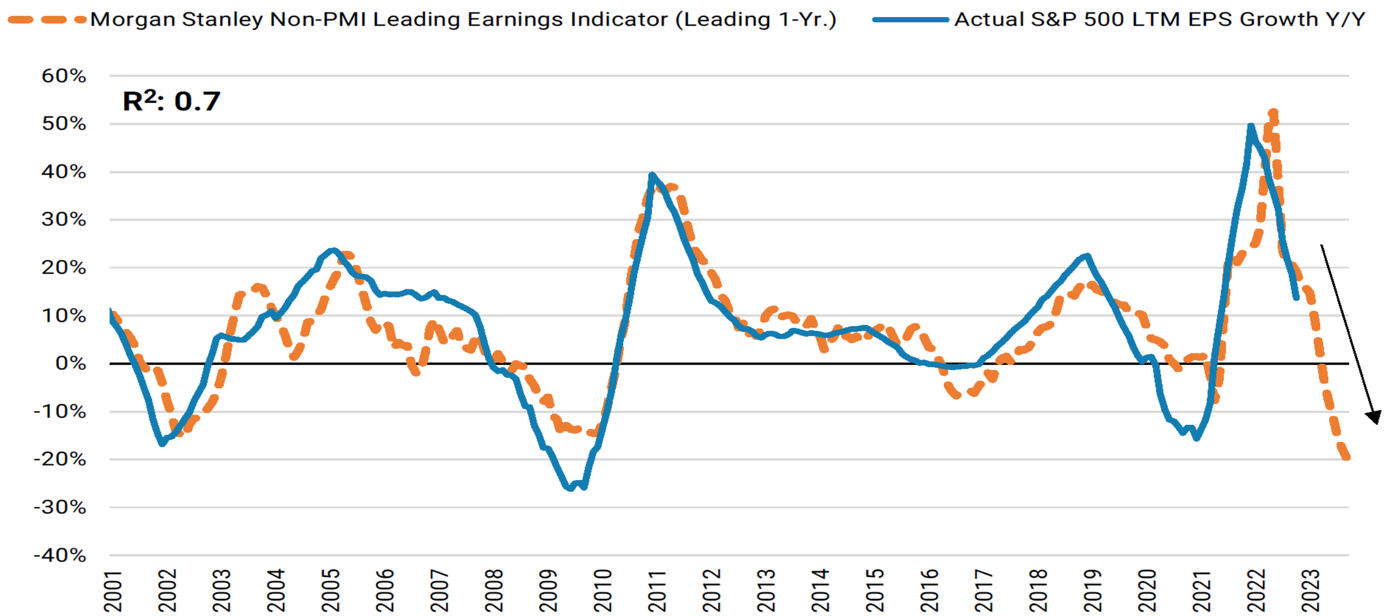


Morgan Stanley Business Conditions Index



Morgan Stanley Leading Earnings Indicator

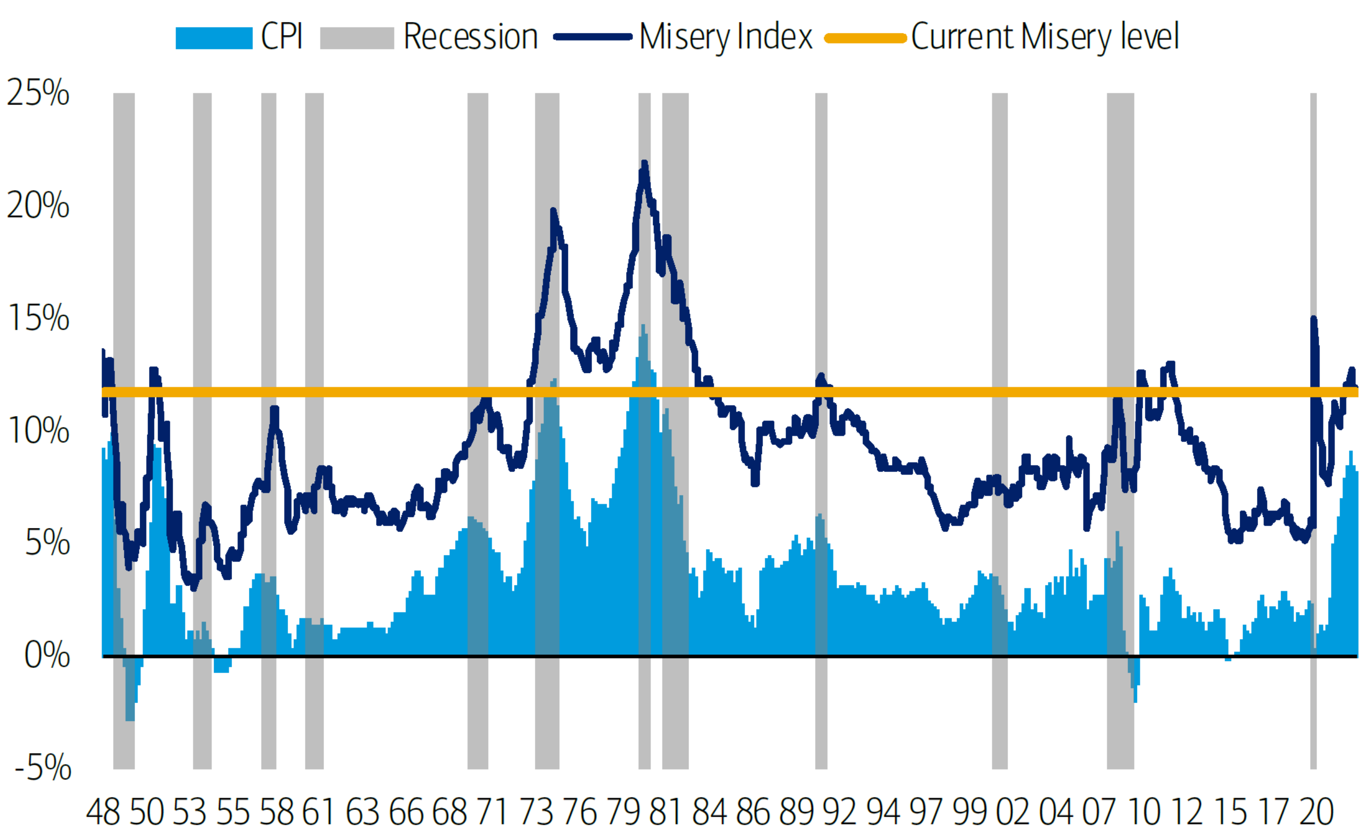




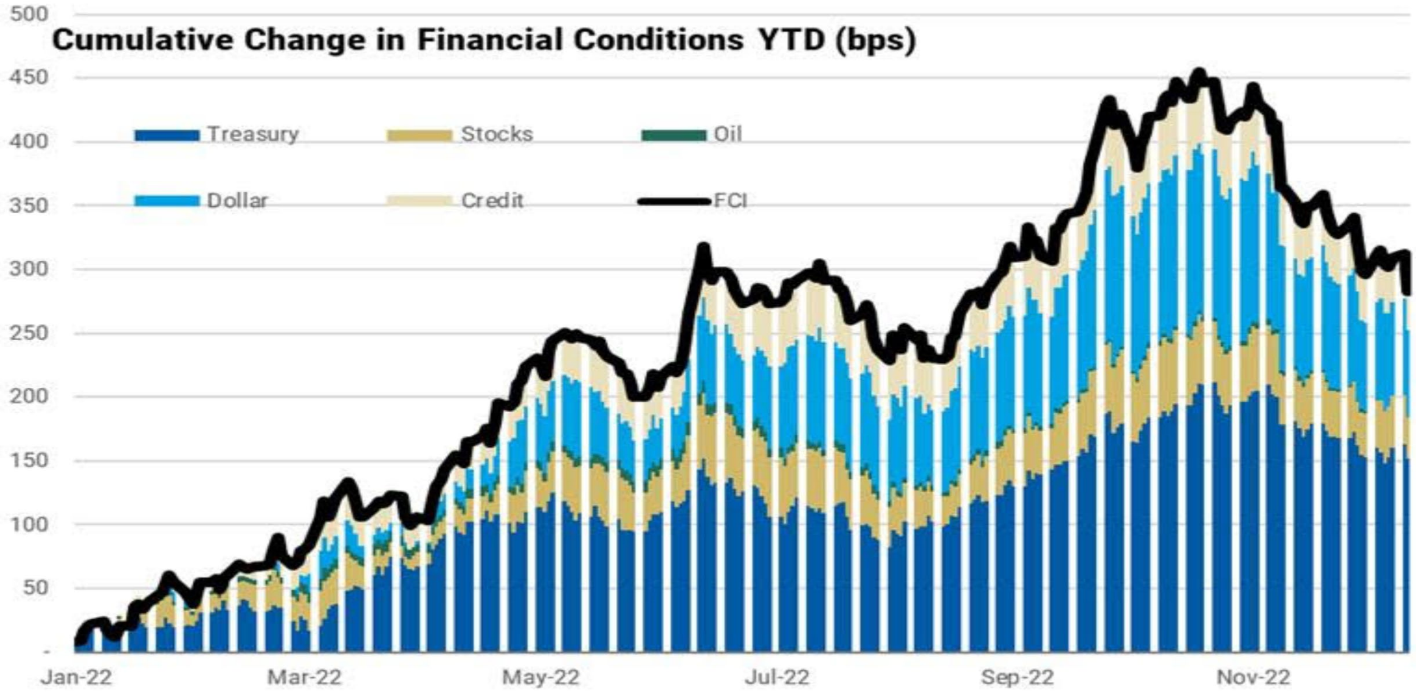
US Misery Indicator

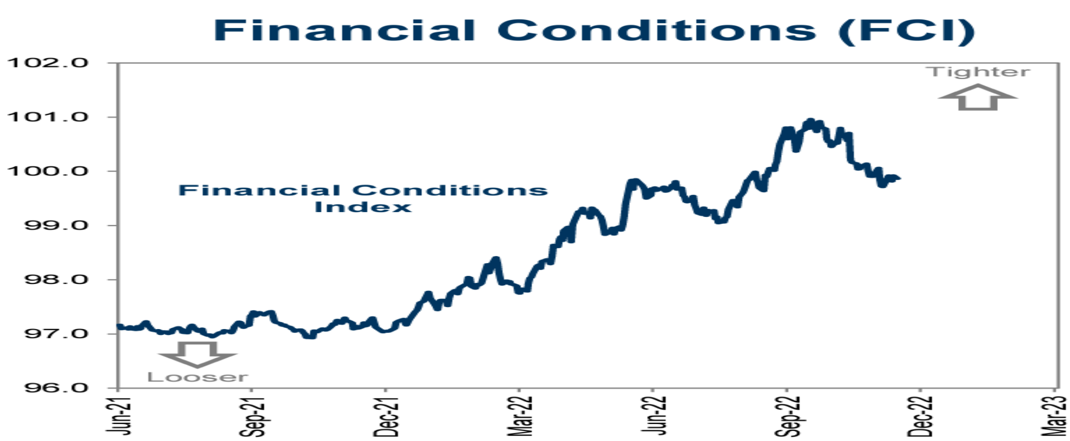
The misery index was initiated by economist Arthur Okun, an adviser to President Lyndon Johnson in the 1960's. It is simply the unemployment rate added to the inflation rate. It is assumed that both a higher rate of unemployment and a worsening of inflation both create economic and social costs for a country. A combination of rising inflation and more people out of work implies a deterioration in economic performance and a rise in the misery index.

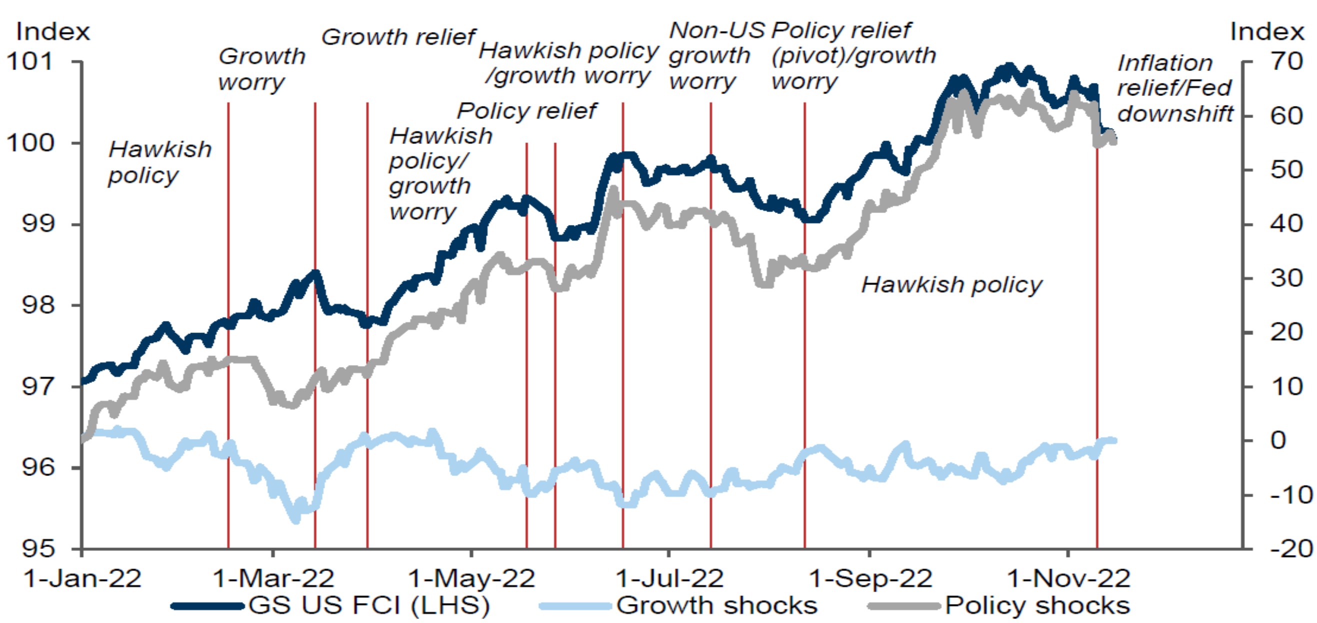
US Misery Indicator and CPI (1948-10/22)



Morgan Stanley & Goldman Sachs Financial Conditions Index





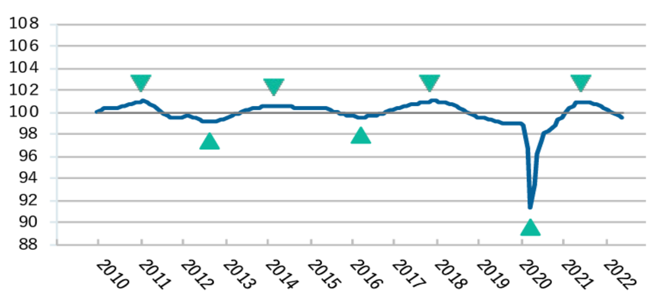


OECD Leading Indicators

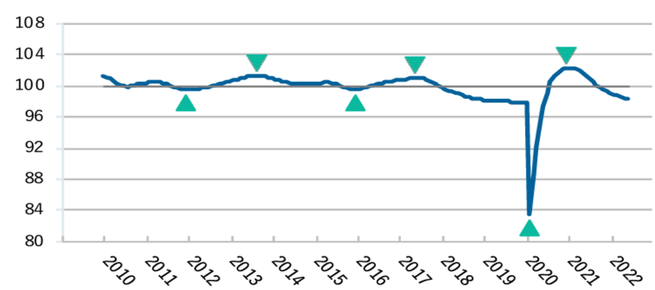
The OECD system of composite leading indicators, first developed in the 1980s, is designed to give early signals of turning points in economic activity. The OECD CLI system uses the monthly index of industrial production (IIP) as a proxy measure for economic activity. The CLI system focuses on the business cycle, defined as the difference between the smoothed IIP data and its long-term trend. OECD CLIs aim to predict turning points in this business cycle estimate. A turning-point in the CLI will generally signal a turning-point in the business cycle in 6-9 months. However, lead times sometimes fall outside of this range and turning points are not always correctly identified. On top of identifying turning-points, CLIs also have the property of moving in the same direction as the business cycle. However, the CLI is optimized to identify turning points and not for judging the speed or strength of a recovery or downturn in the business cycle; and users should not interpret it in this way. A very high or low CLI for example cannot be interpreted as an indication of very high or low levels of economic activity or growth. It merely provides a strong signal of the phase a country is likely to be in its business cycle in the near future.

The OECD Composite Leading Indicators (CLIs), designed to anticipate turning points and economic fluctuations relative to trend, continue to signal a weak outlook in the OECD area and in most major economies based on information up to November 2022.

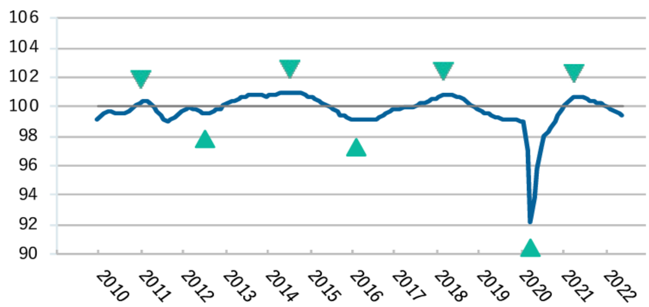
OECD area:
Growth losing momentum



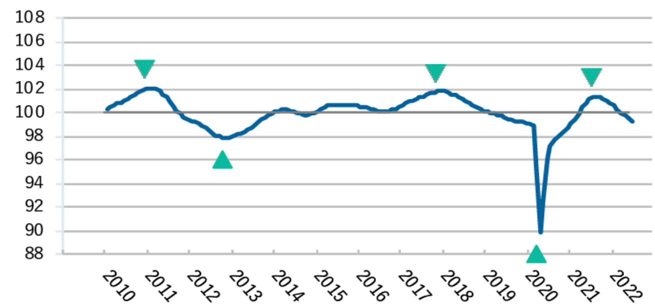
China:
Stable growth



United States:
Growth losing momentum

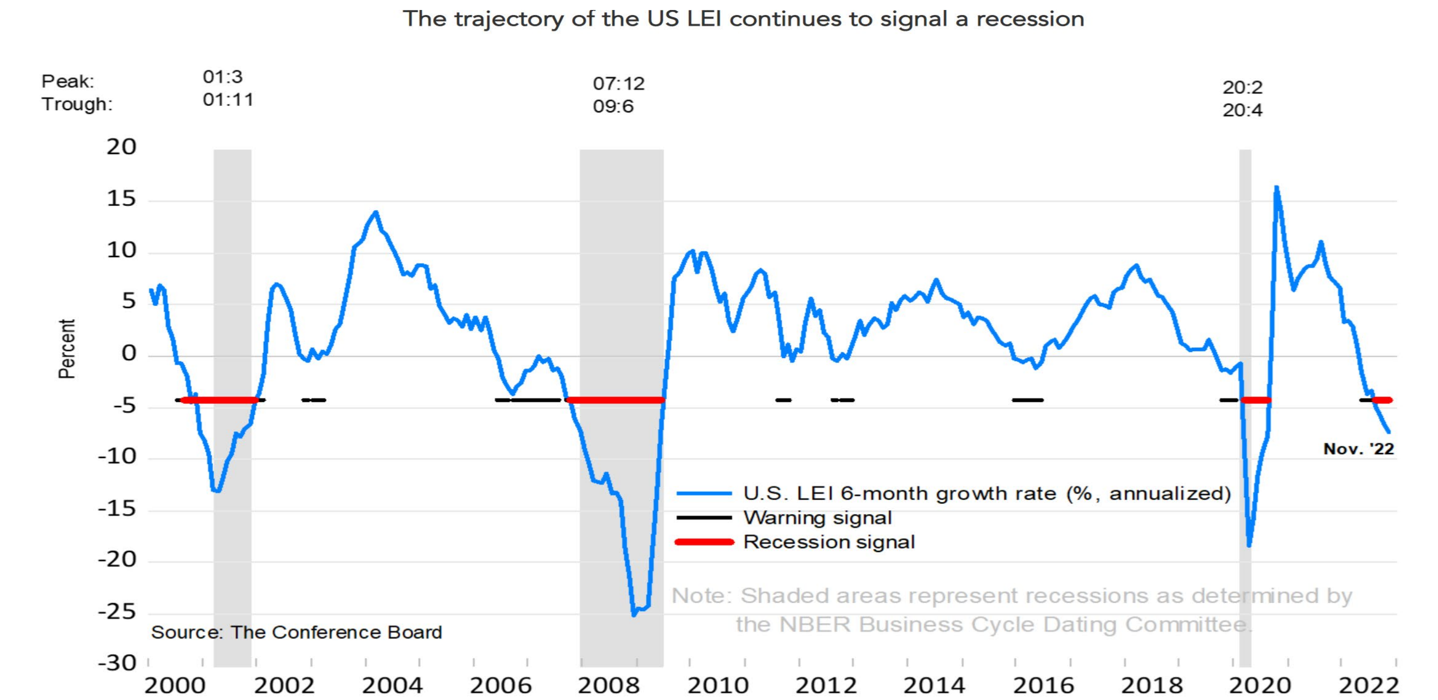


Euro area:
Growth losing momentum



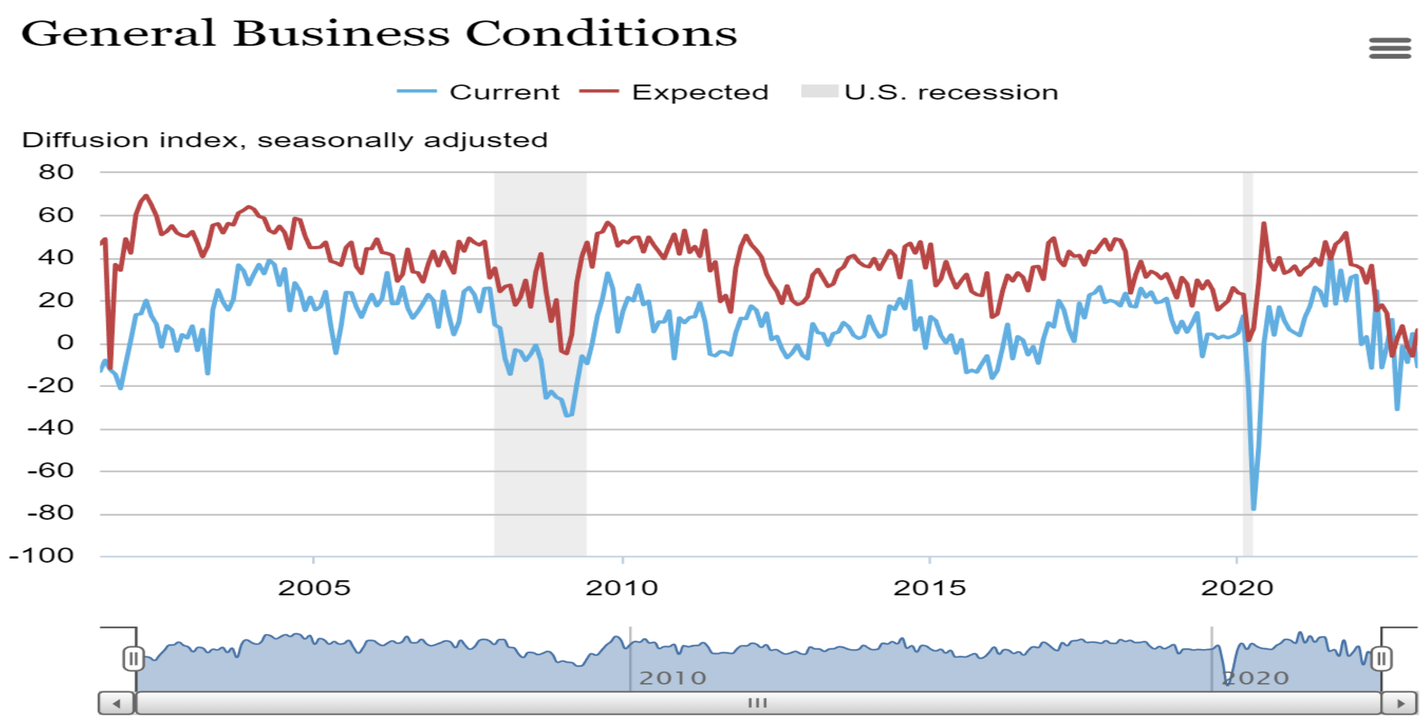
US Leading Economic Indicators

The Conference Board Leading Economic Index decreased by 1.0 percent in November 2022 to 113.5 (2016=100), following a decline of 0.9 percent in October. The LEI is now down 3.7 percent over the six-month period between May and November 2022—a much steeper rate of decline than its 0.8 percent contraction over the previous six-month period, between November 2021 and May 2022. Only stock prices contributed positively to the US LEI in November. Labor market, manufacturing, and housing indicators all weakened—reflecting serious headwinds to economic growth. Interest rate spread and manufacturing new orders components were essentially unchanged in November, confirming a lack of economic growth momentum in the near term.



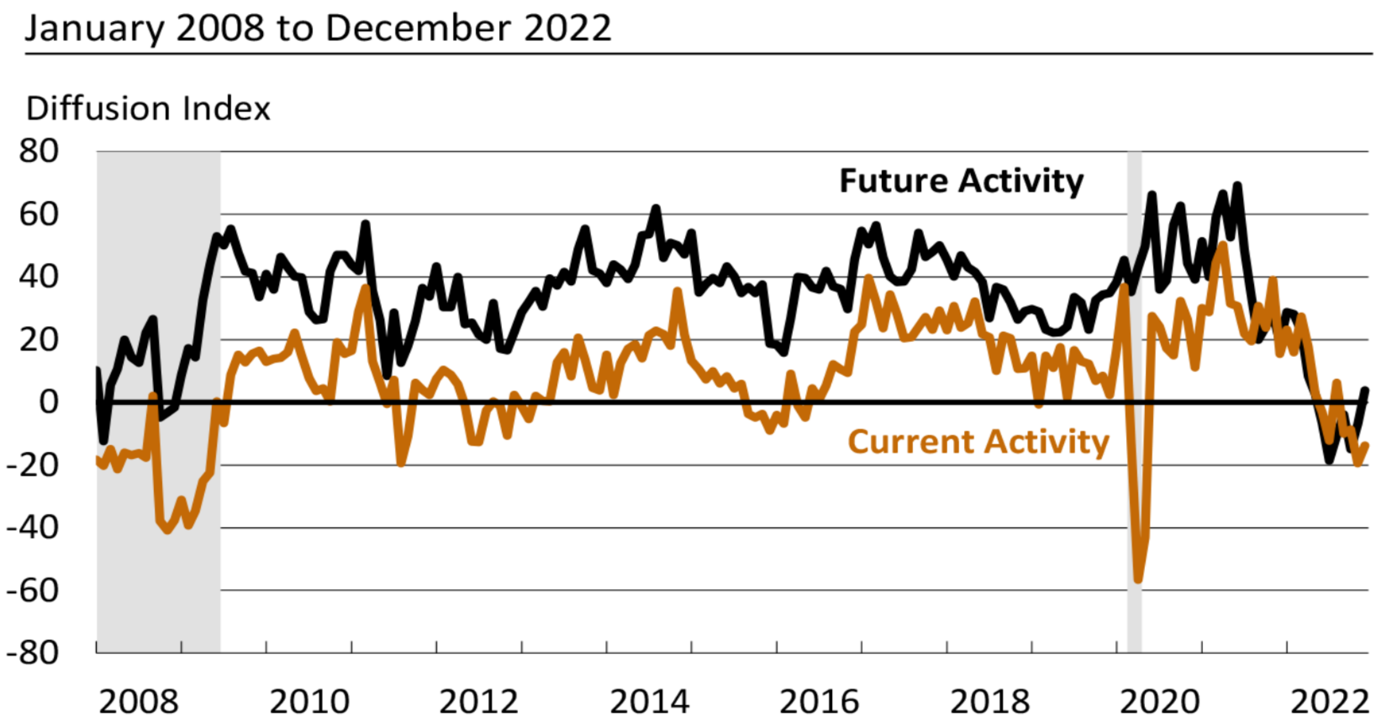
Empire State Manufacturing Survey

Business activity declined in New York State, according to firms responding to the December 2022 Empire State Manufacturing Survey. The headline general business conditions index fell sixteen points to -11.2. New orders moved slightly lower, while shipments edged higher. Delivery times and inventories were little changed. Labor market indicators pointed to a moderate increase in employment, but a slightly shorter average workweek. Input prices and selling prices increased at about the same pace as last month. Looking ahead, firms expect some improvement in business conditions over the next six months, but optimism was very subdued. The index for future business conditions climbed twelve points, but remained subdued at 6.3, suggesting that firms expect little improvement over the next six months. The indexes for future new orders and shipments climbed above zero, indicating that small increases are anticipated, and employment is expected to continue to increase. The capital spending index rose nine points to 23.4



Philly Fed Index

The diffusion index for current general activity remained negative but rose 6 points to -13.8 this month (see Chart 1). This is its fourth consecutive negative reading and sixth negative reading in the past seven months. Thirty-one percent of the firms reported declines in activity, while 17 percent reported increases. The majority (51 percent) reported no change. The indicators for new orders and shipments both declined: The new orders index decreased 9 points to -25.8, its lowest reading since April 2020, and the shipments index fell 13 points to -6.2, its first negative reading since May 2020. The diffusion index for future general activity increased for the second consecutive month, rising 10 points to 3.8, its first positive reading since May. The survey's indicators for general activity, new orders, and shipments were all negative, and the firms reported a decline in employment, on balance. The survey's broad indicators for future activity improved and indicate firms expect growth overall over the next six months.



Chicago Fed Index

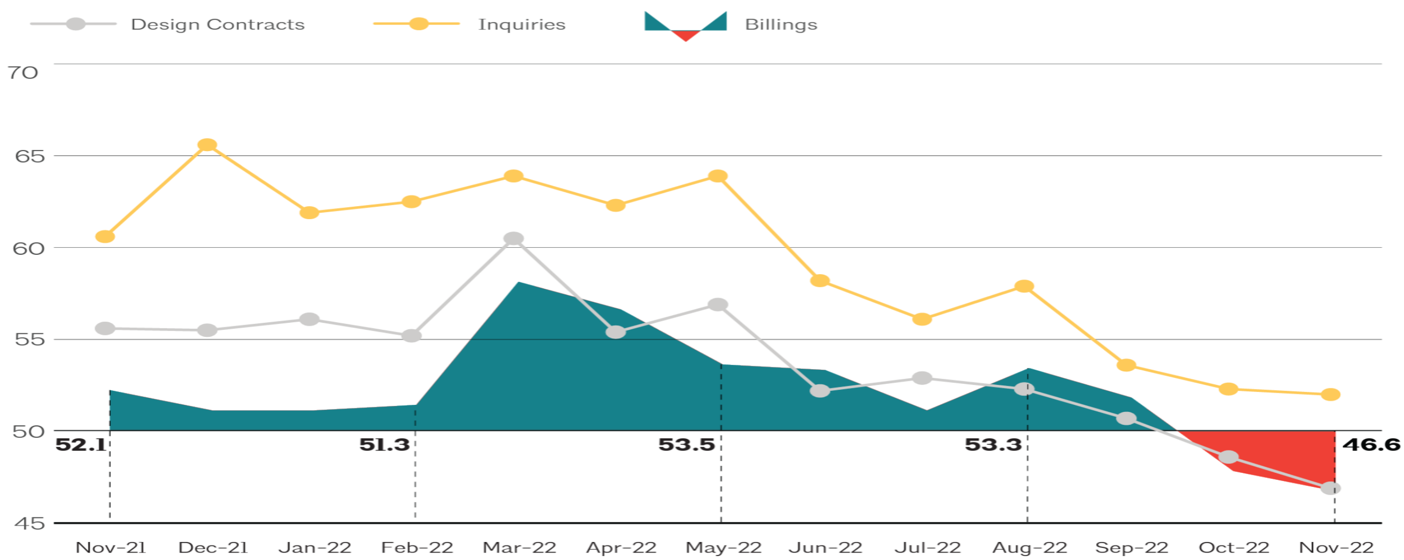
The Chicago Fed National Activity Index (CFNAI) is a monthly index designed to gauge overall economic activity and related inflationary pressure. The CFNAI is a weighted average of 85 existing monthly indicators of national economic activity. It is constructed to have an average value of zero and a standard deviation of one. Since economic activity tends toward trend growth rate over time, a positive index reading corresponds to growth above trend and a negative index reading corresponds to growth below trend. The 85 economic indicators that are included in the CFNAI are drawn from four broad categories of data: production and income; employment, unemployment, and hours; personal consumption and housing; and sales, orders, and inventories. Each of these data series measures some aspect of overall macroeconomic activity. The derived index provides a single, summary measure of a factor common to these national economic data.

The Chicago Fed Survey of Economic Conditions (CFSEC) Activity Index decreased to –32 in November from –27 in October, suggesting that economic growth was well below trend. The CFSEC Manufacturing Activity Index decreased to –38 in November from –33 in October, and the CFSEC Nonmanufacturing Activity Index decreased to –27 in November from –23 in the previous month. Respondents' outlooks for the U.S. economy for the next 12 months improved slightly, but remained pessimistic on balance. Sixty-seven percent of respondents expected a decrease in economic activity over the next 12 months.

Architecture Billings Index

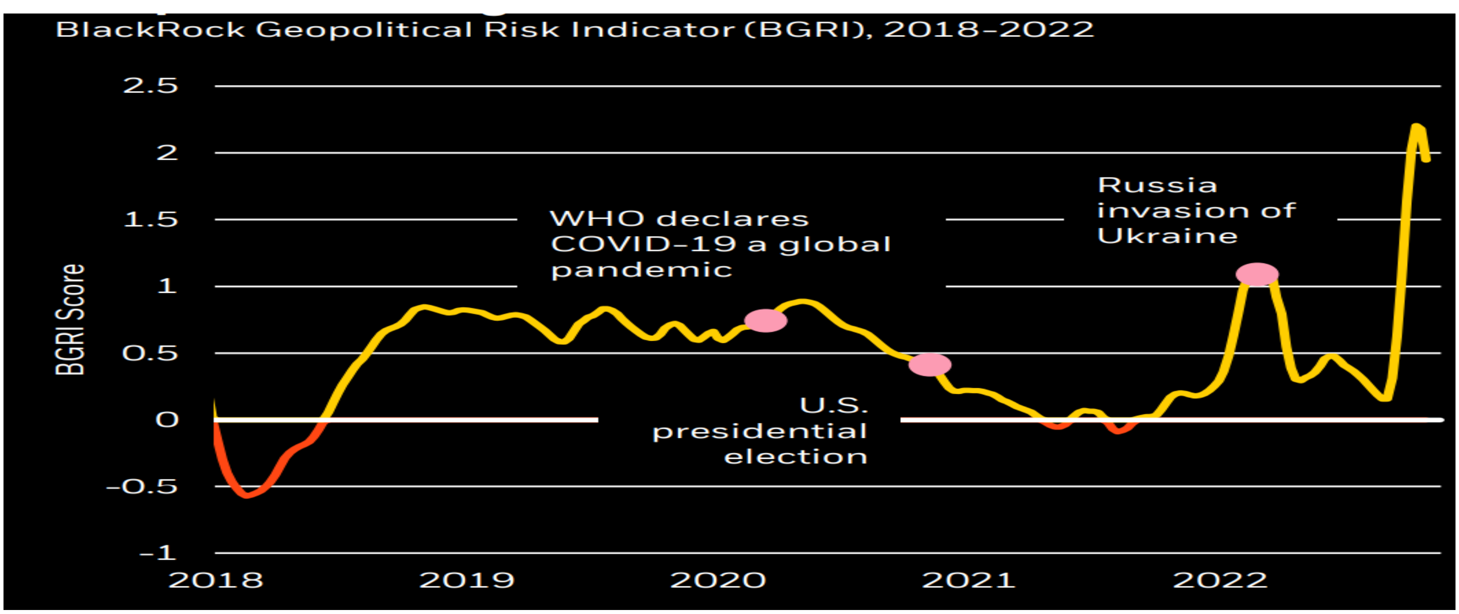
The *Architecture Billings Index* is an economic indicator for nonresidential construction activity, with a lead time of approximately 9–12 months.

October saw the first decline in the American Institute of Architect's (AIA) Architecture Billings Index (ABI) after 20 months of consecutive growth, and the downward trend in scores continued into the month of November. The monthly report released by the professional organization reported a score of 46.6 for November, down from 47.7 the previous month—any score below 50 indicates a decline in firm billings. The scores, aggregated from responding firms, signify a drop in both current and incoming work. The score for new contracts dropped from 48.6 last month to 46.9 in November.

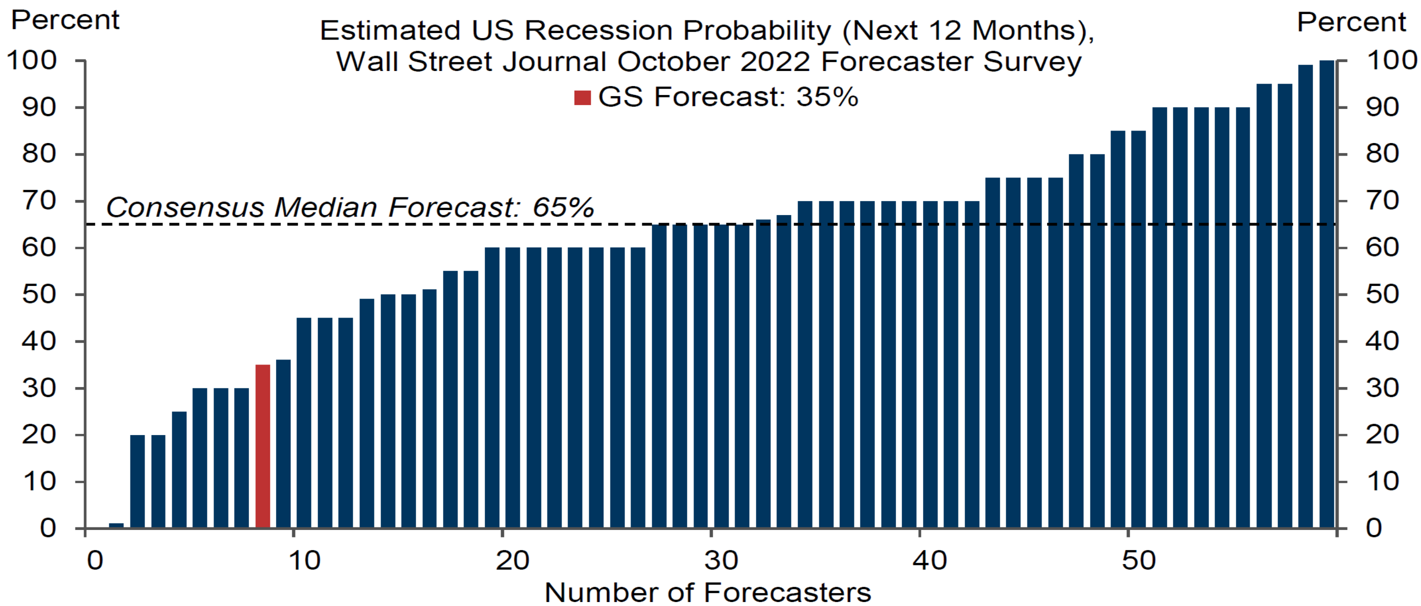


Geopolitical Risk Index

The BlackRock Geopolitical Risk Indicator (BGRI) tracks the relative frequency of brokerage reports (via Refinitiv) and financial news stories (Dow Jones News) associated with specific geopolitical risks. We adjust for whether the sentiment in the text of articles is positive or negative, and then assign a score. This score reflects the level of market attention to each risk versus a 5-year history. We assign a heavier weight to brokerage reports than other media sources since we want to measure the market's attention to any particular risk, not the public's.

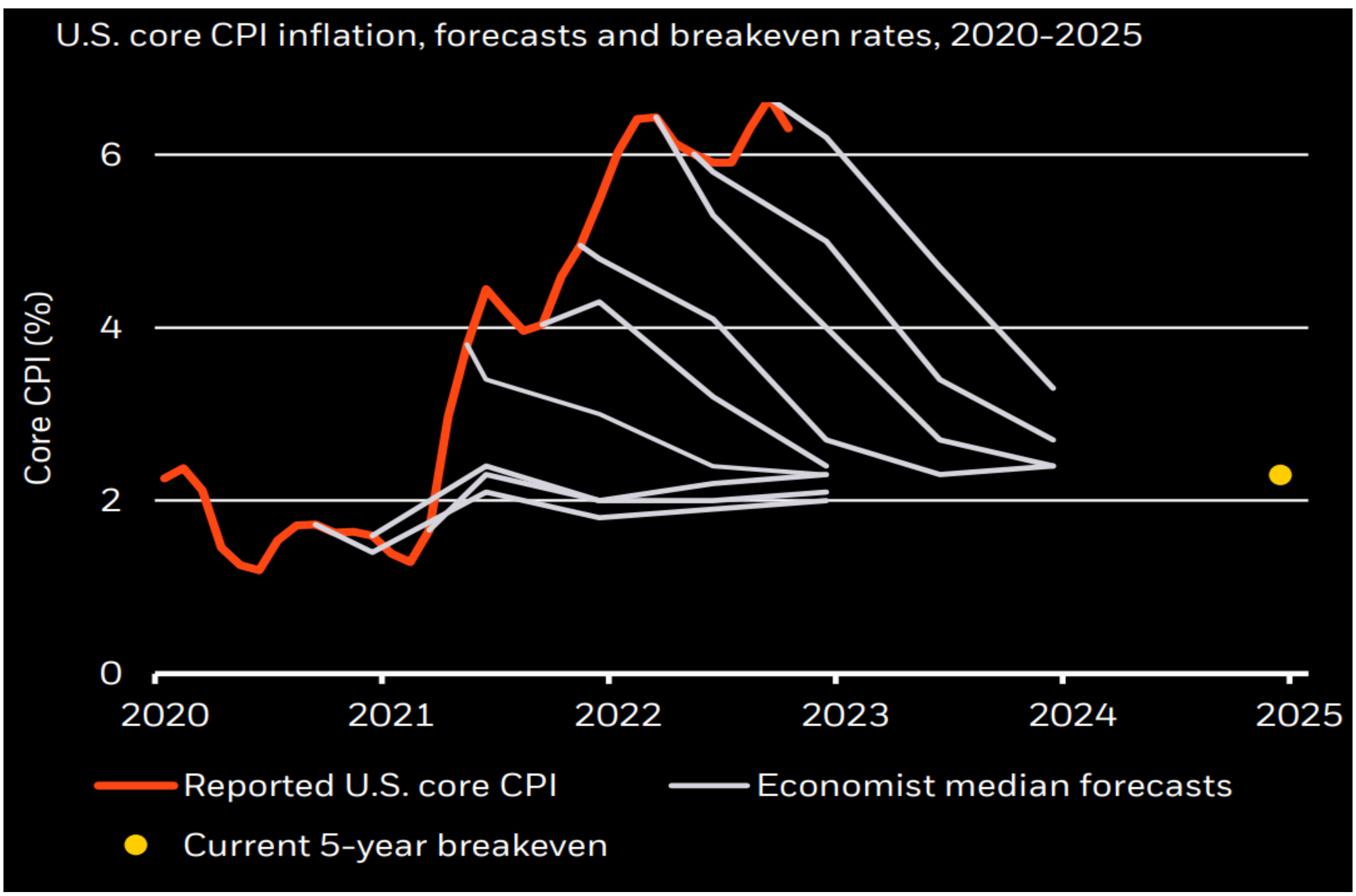


Recession Probability Survey

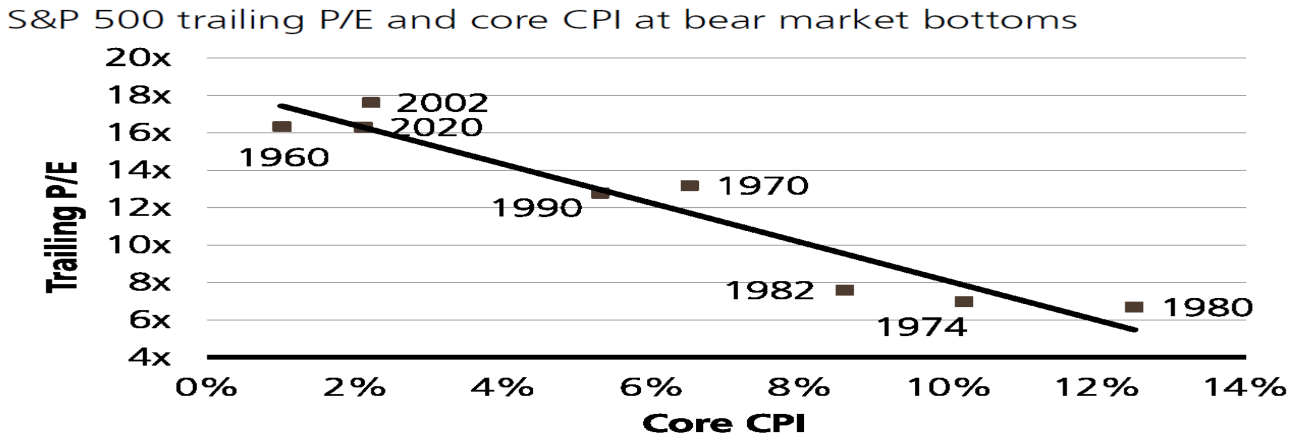


Inflation

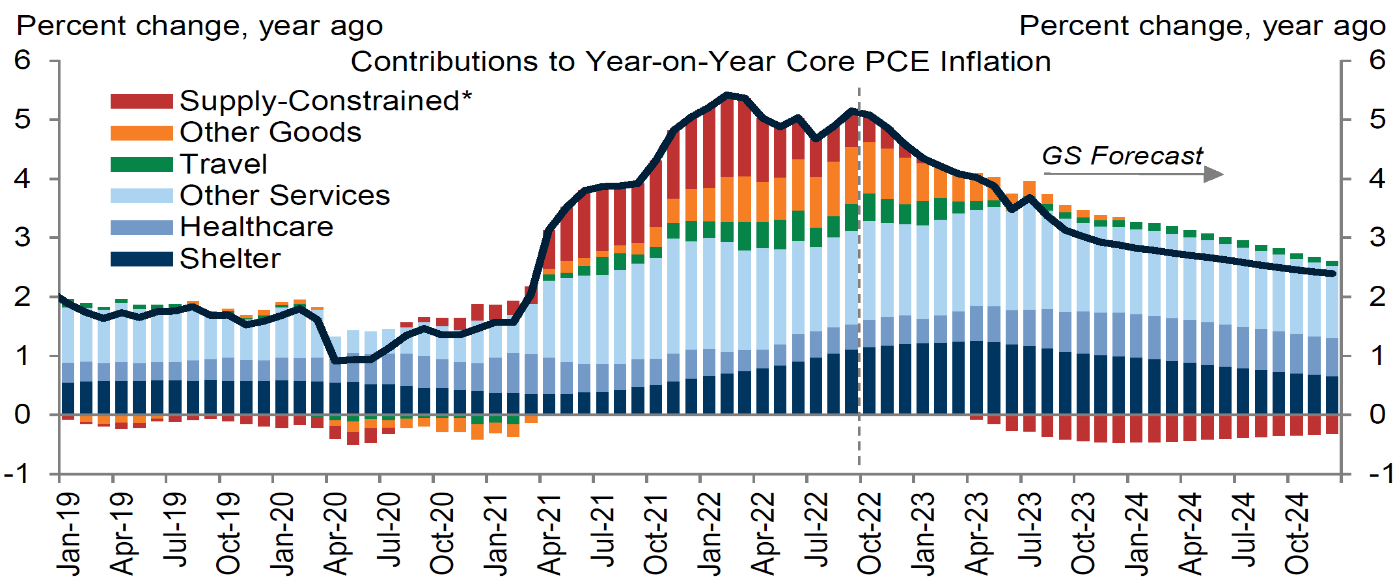
Inflation as a key market driver in 2022 for volatility and persistent inflation remains a key market risk into 2023, though all signs and the consensus expectation point to peak inflation behind us and normalizing the next two years.



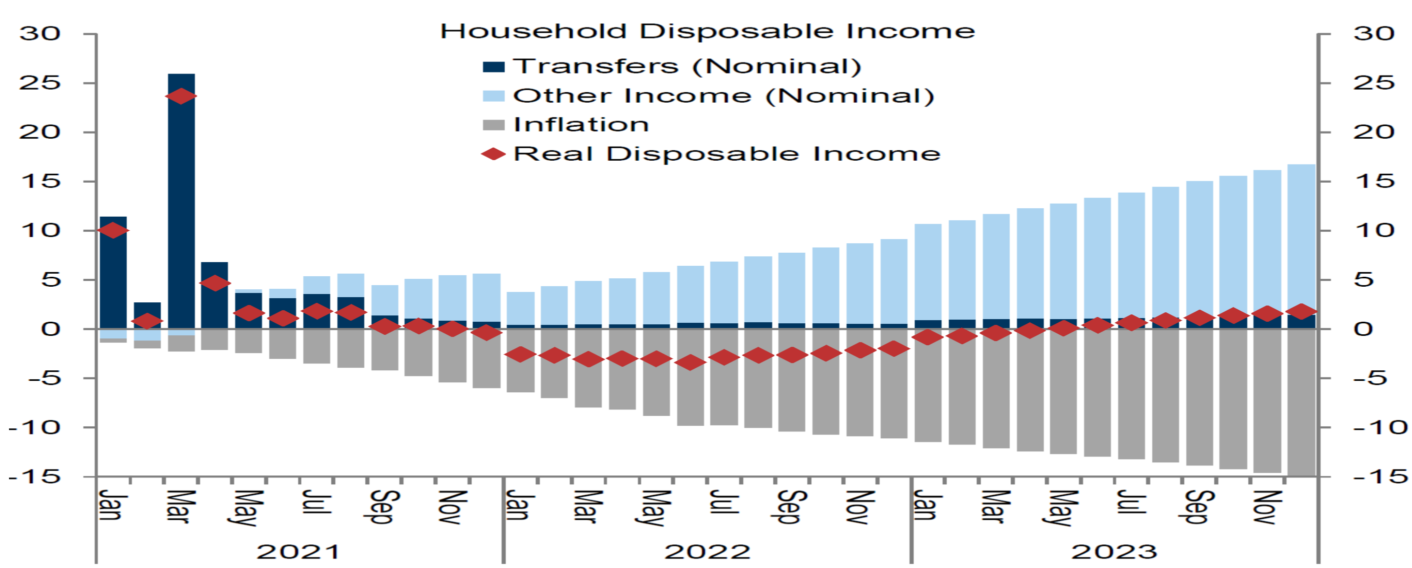
Core inflation is a good predictor of where the P/E ratio bottoms in a bear market. Before a bear market bottom, usually the 2-year Treasury yield has already started declining, the equity risk premium has risen quite a bit, and investors are starting to anticipate a re-acceleration in economic and corporate profit growth.



Inflation is seen moderating consistently in the next few quarters while consumer balance sheets remain very healthy.



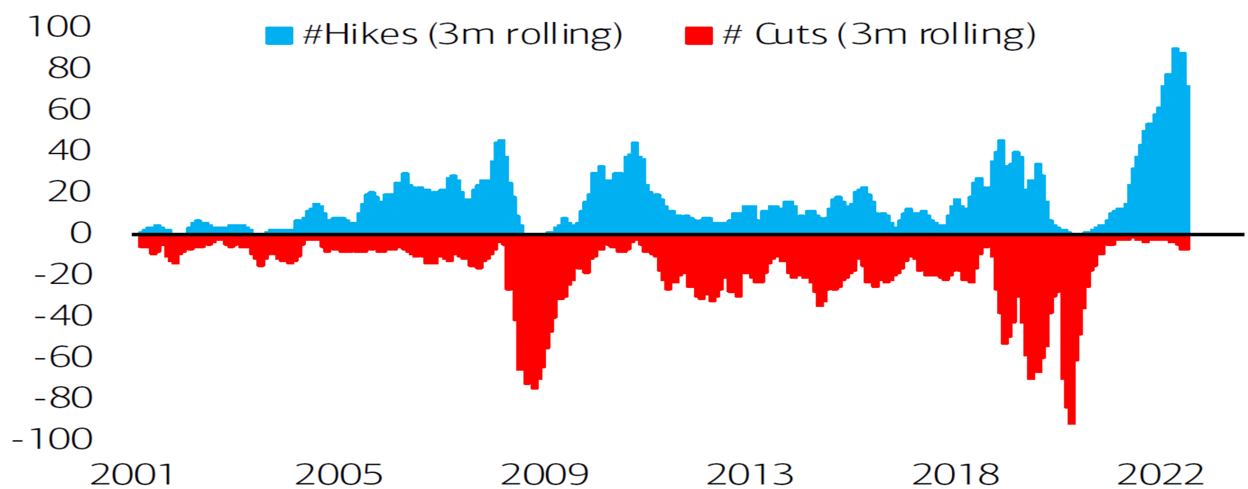
* New, used, and rental cars, furniture, sporting equipment, household appliances, sports and recreational vehicles, and video, audio, photo, and info. equipment.



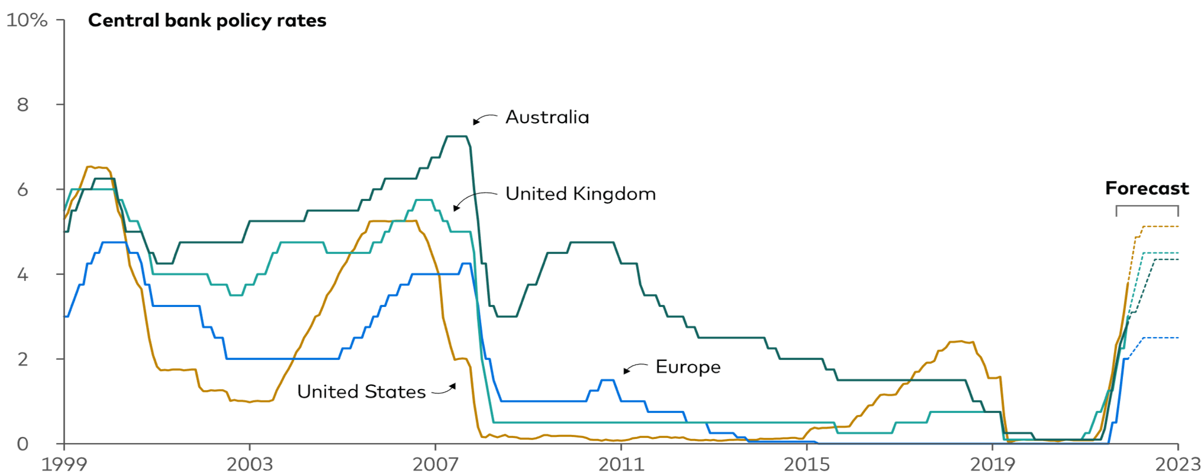
Central Banks

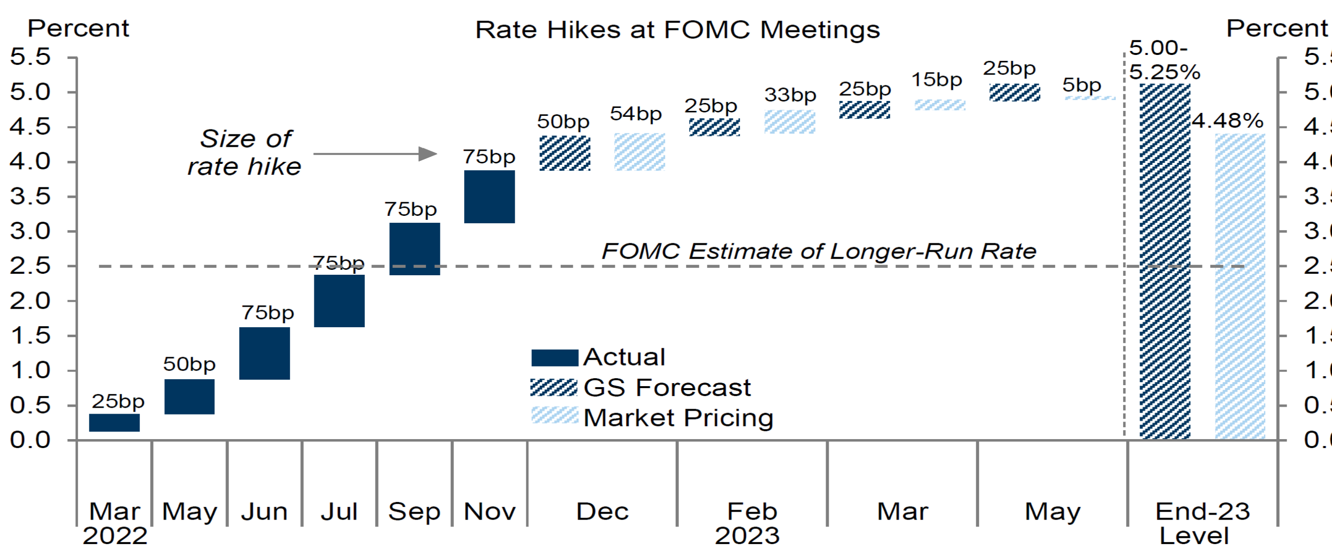
Global central banks embarked on the most intense hiking cycle on record in 2022. Persistent inflation could keep yields higher for longer and a deeper recession than expected could see the rates shock morph into a more profound credit crunch. The S&P 500 has averaged 14% in the year after the Fed's final hike, with gains in 9 out of 13 cycles.

# of global central banks hikes and cuts



A globally coordinated monetary tightening regime



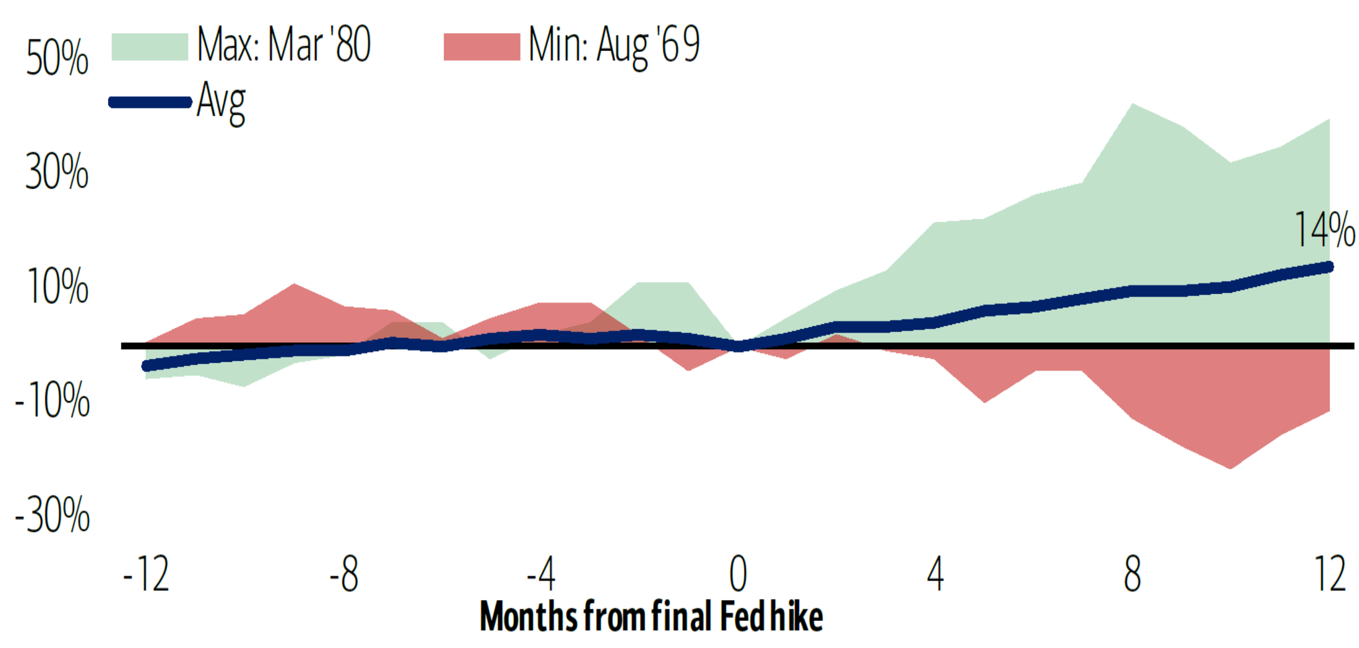


The mix of ultra-easy monetary and fiscal policy at the start of the cycle, healthy private sector balance sheets and remaining tailwinds from post-Covid normalization has led to a greater ability to absorb rising policy rates. Tightening affects the economy with lags and persistent inflation threatens to keep the Fed in a position where it sees the need to tighten to slow the economy more sharply. The impact of higher rate *levels* also poses risks through other channels. Those include the potential downside risks to housing markets and the possibility that pockets of stress emerge in the non-bank financial system over time in areas where decisions were predicated on much lower rate discussions (private equities and credit; leveraged loans) as they have done in the UK LDI and crypto space.

Pre-GFC, earnings were nearly all that mattered, explaining ~50% of S&P 500 returns. But post-GFC, we saw a regime shift, where earnings mattered less (23% explanatory power), with the Fed balance significantly gaining importance. The Fed balance sheet didn't matter at all before the GFC, but it drove over half of non-earnings driven return of the S&P 500. There is an expected $1.1T reduction in the Fed balance sheet by the end of 2023.

The first Fed cut in the median hiking cycle has historically come roughly six months after the last hike. The Fed thinks the "normal" federal funds rate is about 2.5% compared to the current rate of 4.5%, and there are indications from the Fed that it will rise to slightly more than 5% in early 2023. So, once inflation is under control, it seems likely that the Fed will begin to cut interest rates, which should lead to a re-acceleration in corporate profit growth, which could be realized in 2024. Small caps tend to outperform large gaps once the Fed stops hiking.

Returns +/- one years around the last Fed hike in each cycle since 1954, n = 13

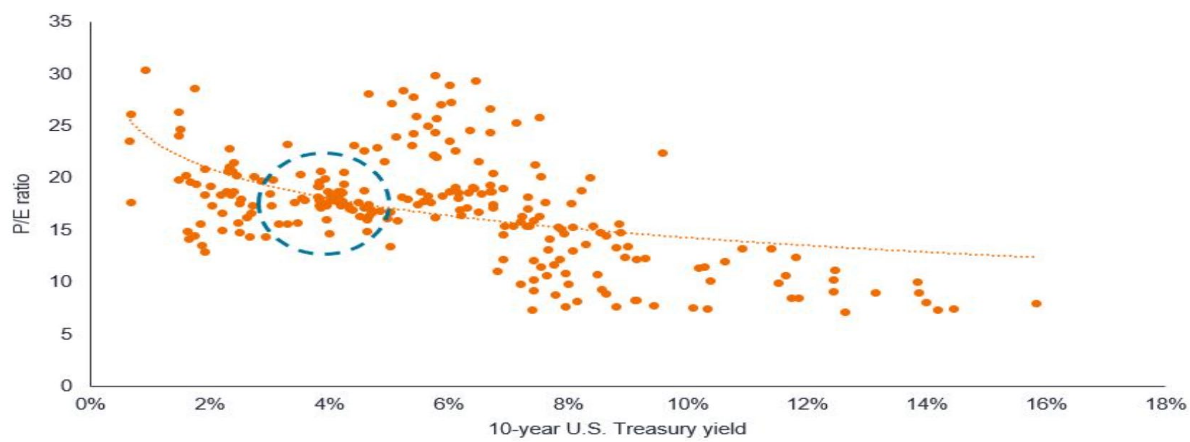


Cyclical equities have outperformed since the summer, credit spreads have tightened and rate curves for 2023 are less inverted than they were. Since some risk of recession is priced, avoiding a recession should ultimately be a source of relief for cyclical assets. But because recession risks are directly linked to the tightening process, and the impact is lagged, it will be hard for the market to be confident that recession has been sustainably averted until the end of tightening is in sight. And, all else equal, avoiding recessionary outcomes should add to the case for continuing with rate hikes. This means that until the inflation picture improves significantly, the market is likely to continue to price some reasonable risk of recession even if a recession continues to be avoided.

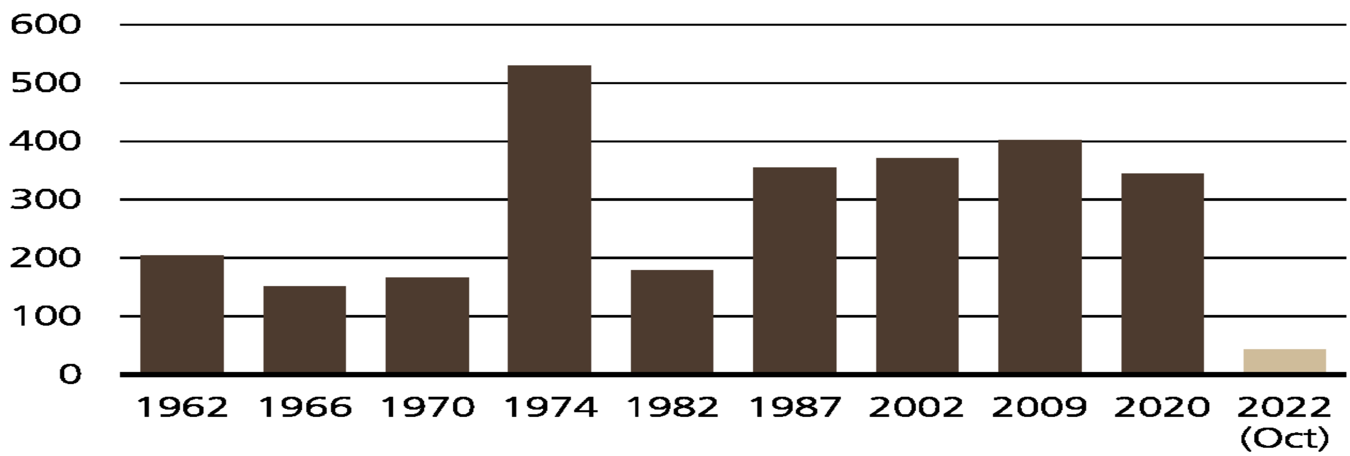
Bonds vs. Stocks

The bond market has sold off for a second consecutive year, the first back-to-back losses since 1958-1959 and never in history has posted three consecutive years of negative returns.

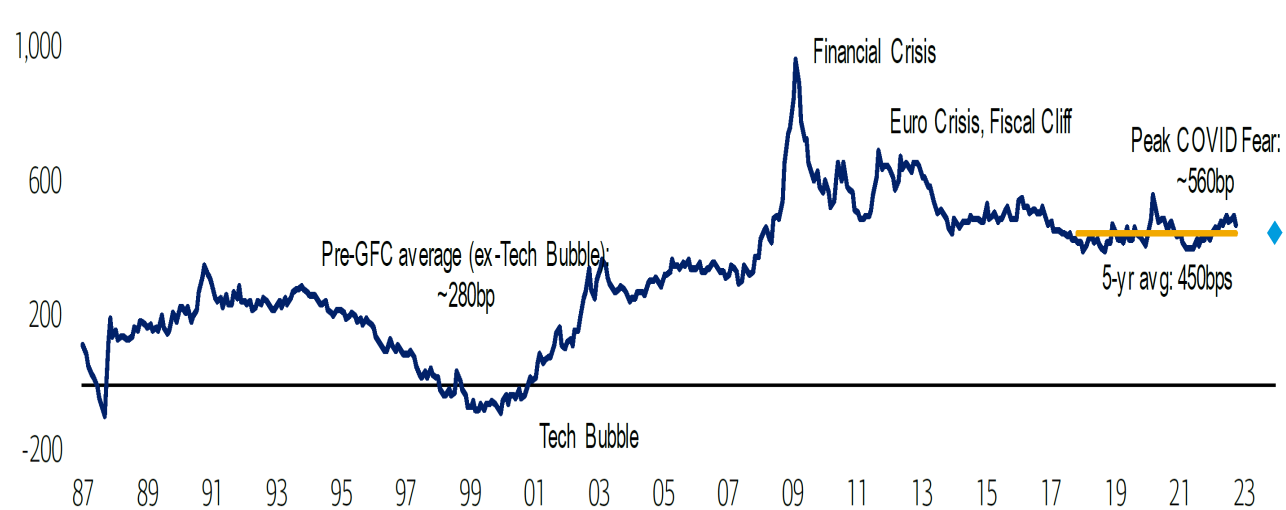
Over the longer term, a 4.0% yield on the 10-year Treasury tends to align with a forward P/E ratio of roughly 16.



Change in equity risk premium from low in the 6 months before market trough, in basis points

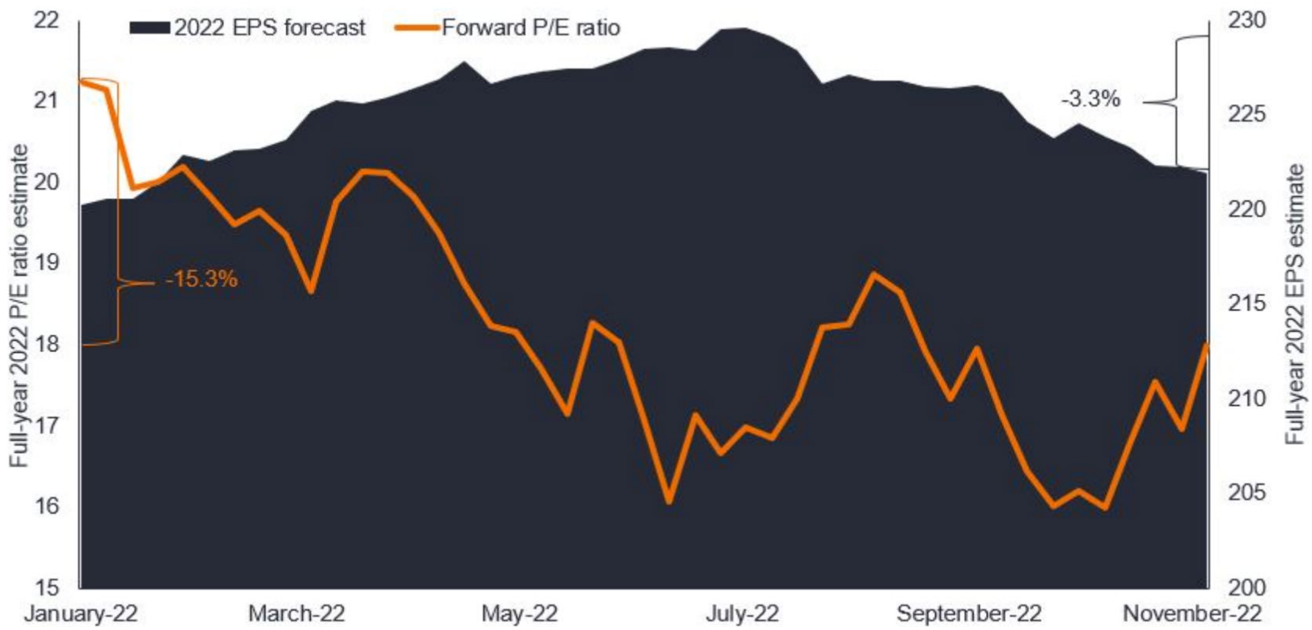


Normalized equity risk premium (ERP) with BofA forecast for YE 2023 (450bps), 1/1987-10/2022

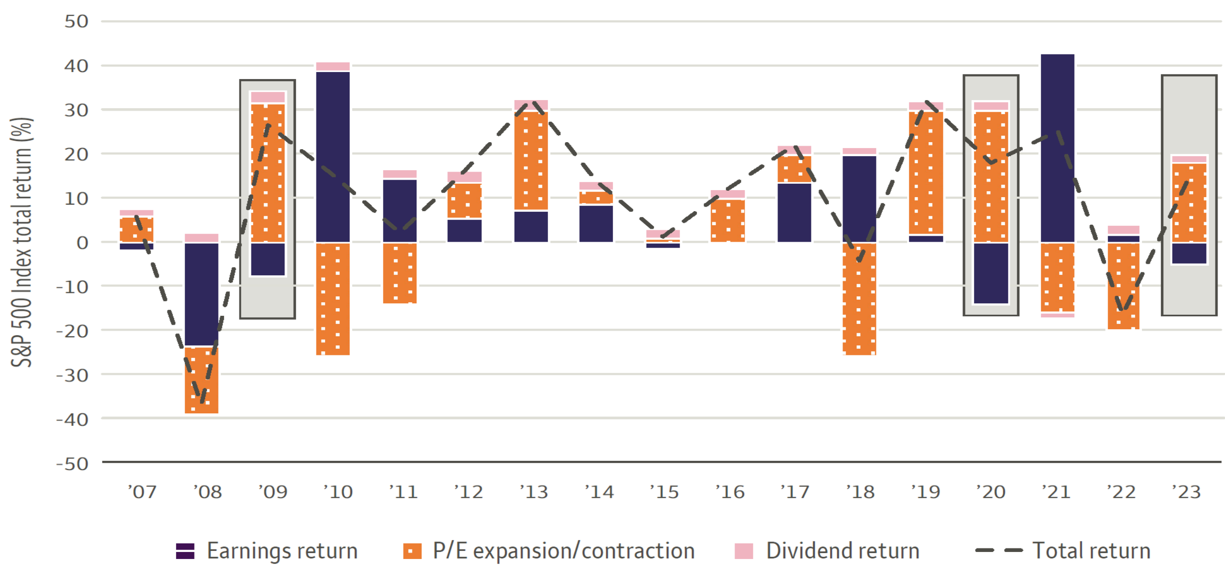


Market Valuation and Fundamentals

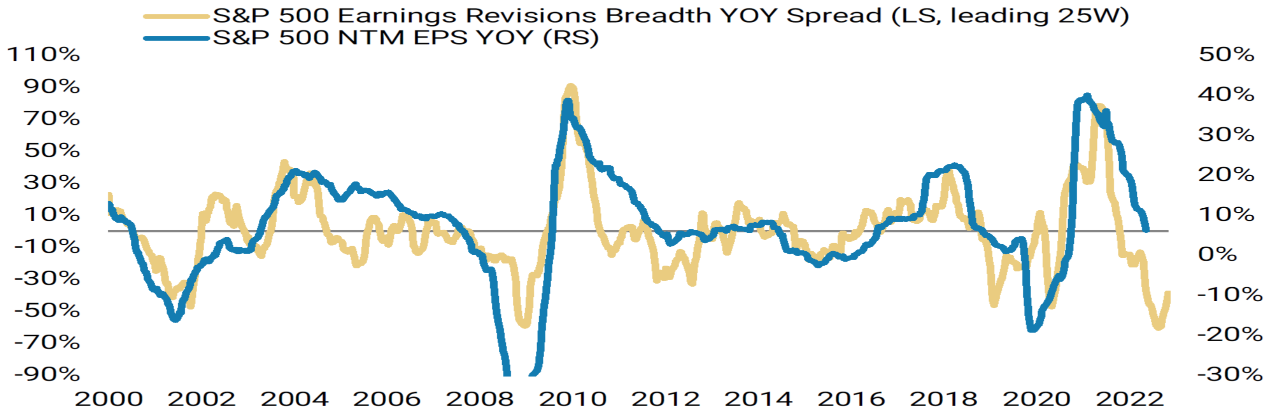
Earnings estimates have been moving lower with the consensus for 2023 now in the $200-$215 zone for the S&P, well below 2022 levels and forecasts to start 2022. A rising Fed Funds Rate tends to correspond to earnings headwinds. The is likely to play out in 1H23 before an economic and earnings recovery starts in 2H23. Once this occurs the multiple tends to lead higher before earnings validate the move. 2023 will likely be about the durability of profit growth considering the ongoing and lagged effects of Fed rate hikes. If the dollar remains at current levels in 2023, it will only be a drag of about 2–3% in 2023, much better than the roughly 8% headwind it has been in 2022.2023 will be a very challenging year for earnings growth, 2024 should be the opposite—a rebound growth year where positive operating leverage resumes.



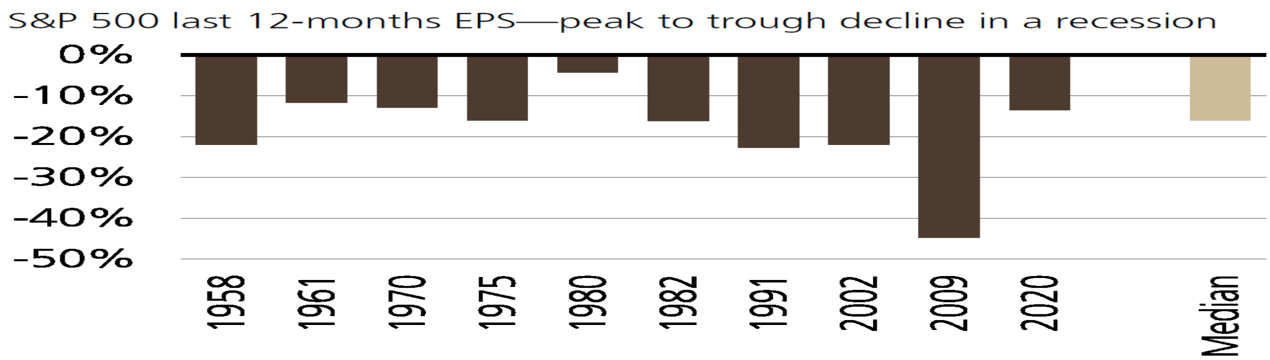
2023 S&P 500 Index total return expected to be driven by P/E expansion



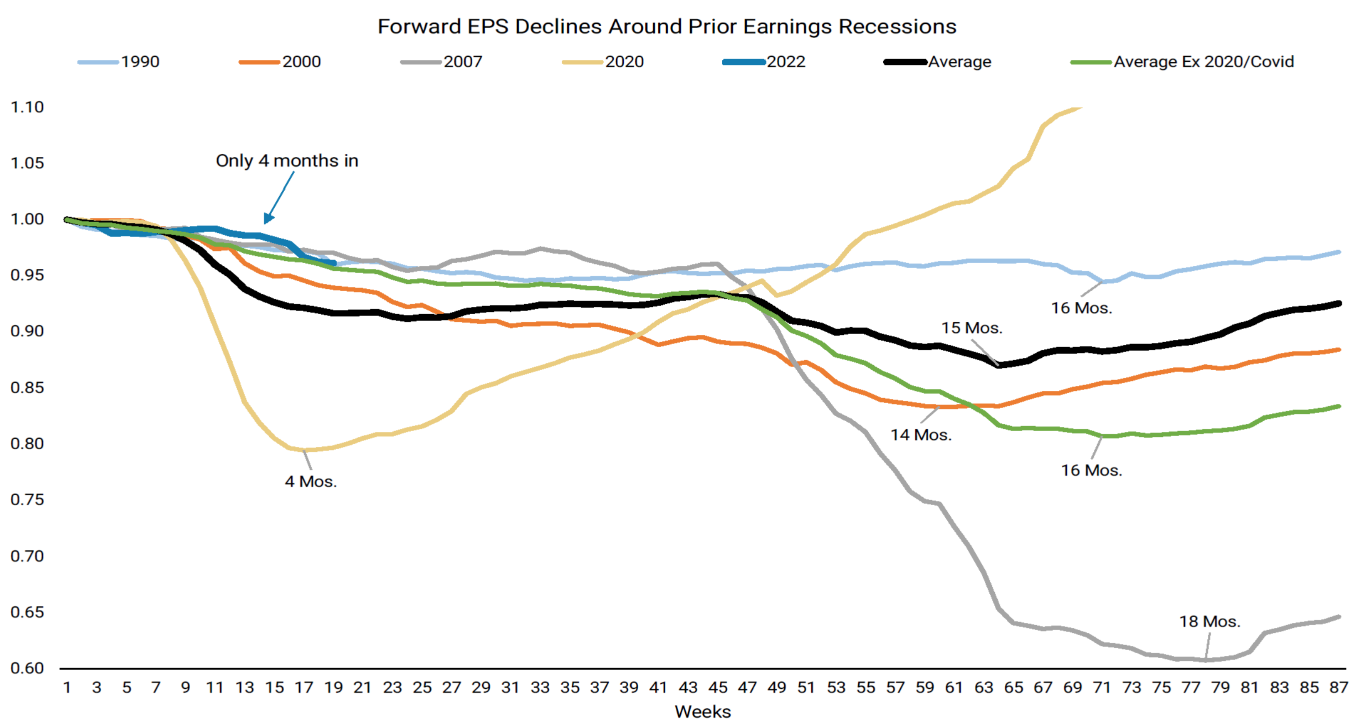
Margin expectations for 2023 appear overly optimistic as cost pressures remain sticky and demand slows. The combination of sticky wage costs and slowing end market/consumer pricing has been evident in recent macro data and loudly signals margin pressure.

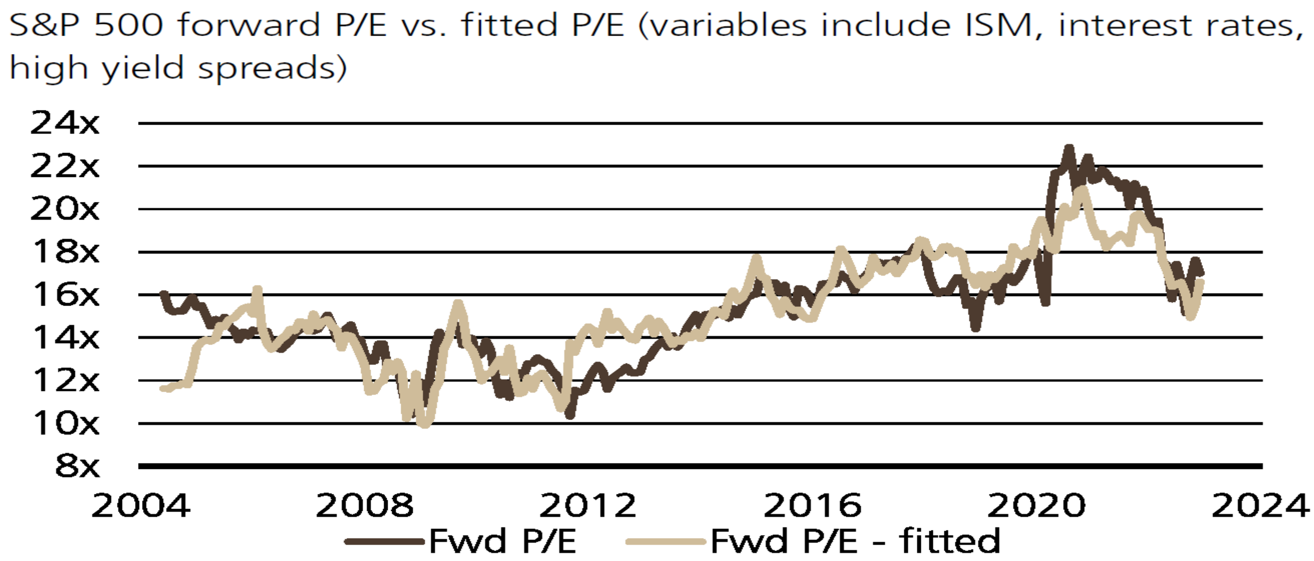


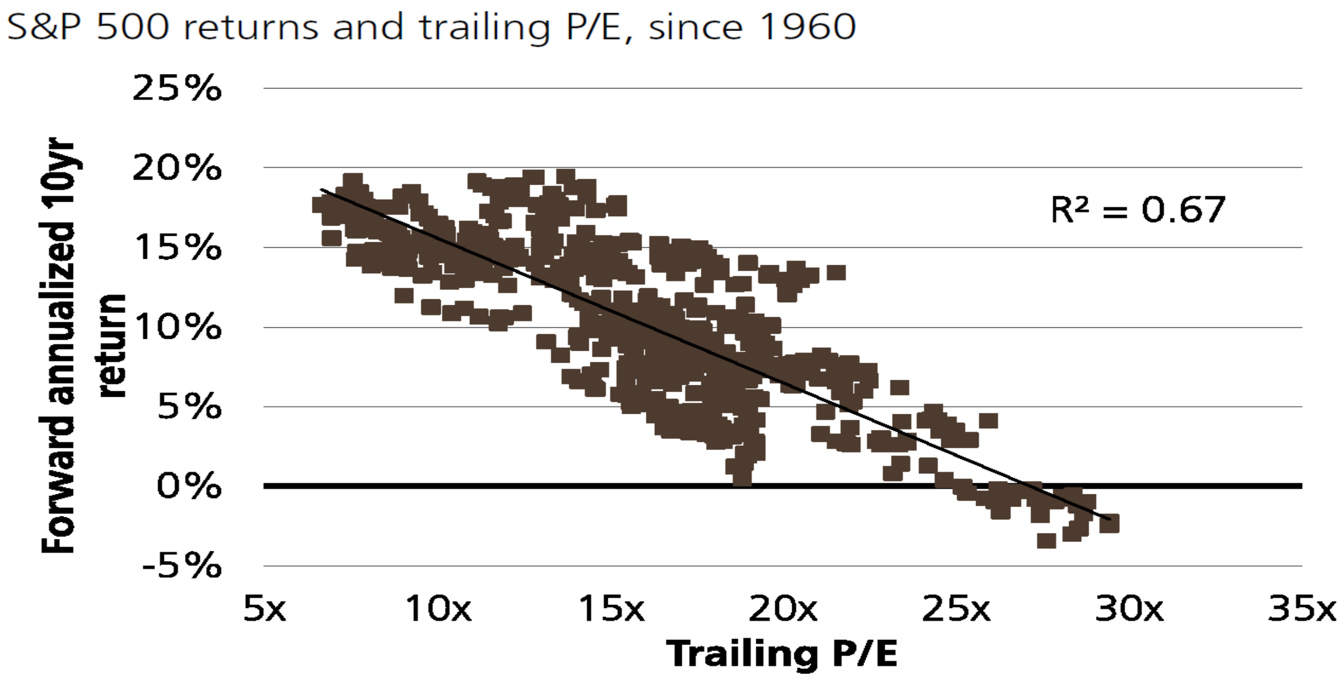
In the case of a full-blown recession S&P EPS could fall 15% or more.



History has proven that earnings recessions tend to be slow to play out. Historically, we've seen the market discount that earnings downside somewhere between ~40-50% of the way through the EPS compression and the market's forward P/E historically bottoms ~40% of the way through the EPS move. The exhibit also shows that the market multiple, on average, troughs ~50% of the way through the EPS move from a duration standpoint. Taking that historical barometer into account, that puts the window for the market to price the full EPS move in Q1 of '23. That timing also coincides with 4Q reporting season when companies will be guiding on '23 EPS.







Valuation

Valuation is never a reason to sell a stock, and the same goes for the market in general, only signs of deteriorating global growth, earnings, business optimism, and global liquidity are appropriate reasons to see reason for an end to the trend.

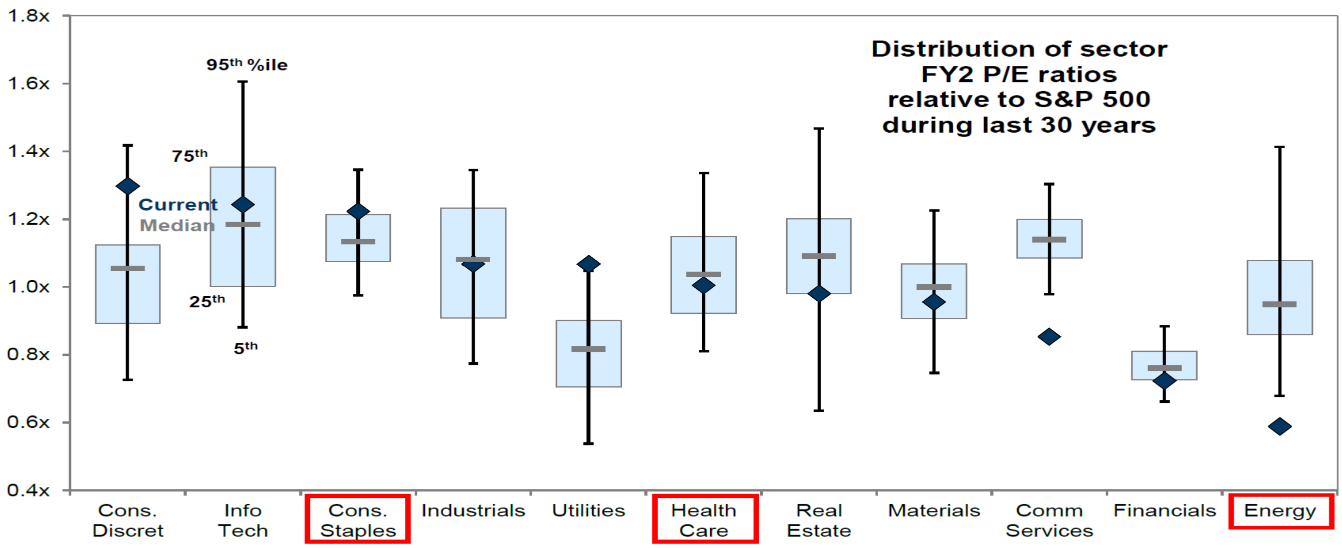
	EPS	Trading Multiple	S&P Value	Probability
Bull Case	$215	17X	3,655	20%
Base Case	$203	16X	3,248	60%
Bear Case	$192	14X	2,688	20%

Similar to our outlook to start 2022, on valuation, this market is not attractive as using a weighted probability of outcomes I get a fair value of 3,217. However, in 2H23 as things improve and we look towards 2024 growth reacceleration combined with PE expansion this number moves to a wide range of outcomes, but all positive with 4200-5000 valuation zone, so the takeaway is 1H23 weakness on an earnings recession is a likely buying opportunity for investors.

Sector and Factor Valuation/Performance

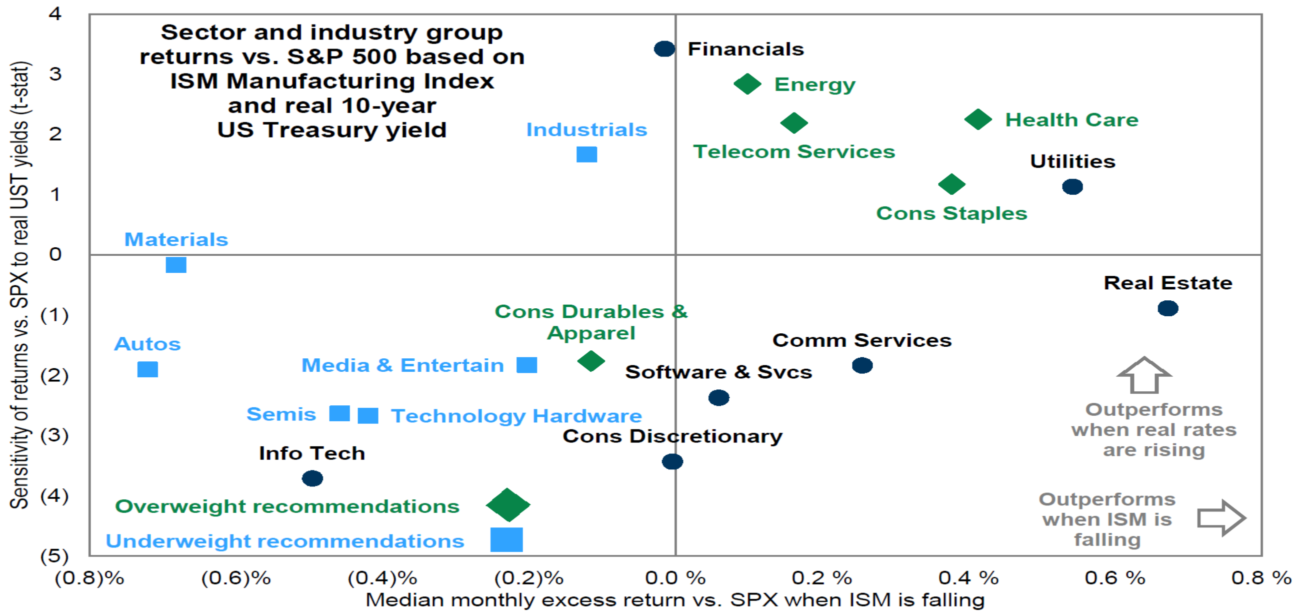
% upside/downside of relative valuations vs relative long-term average by sector, 1986-10/22*

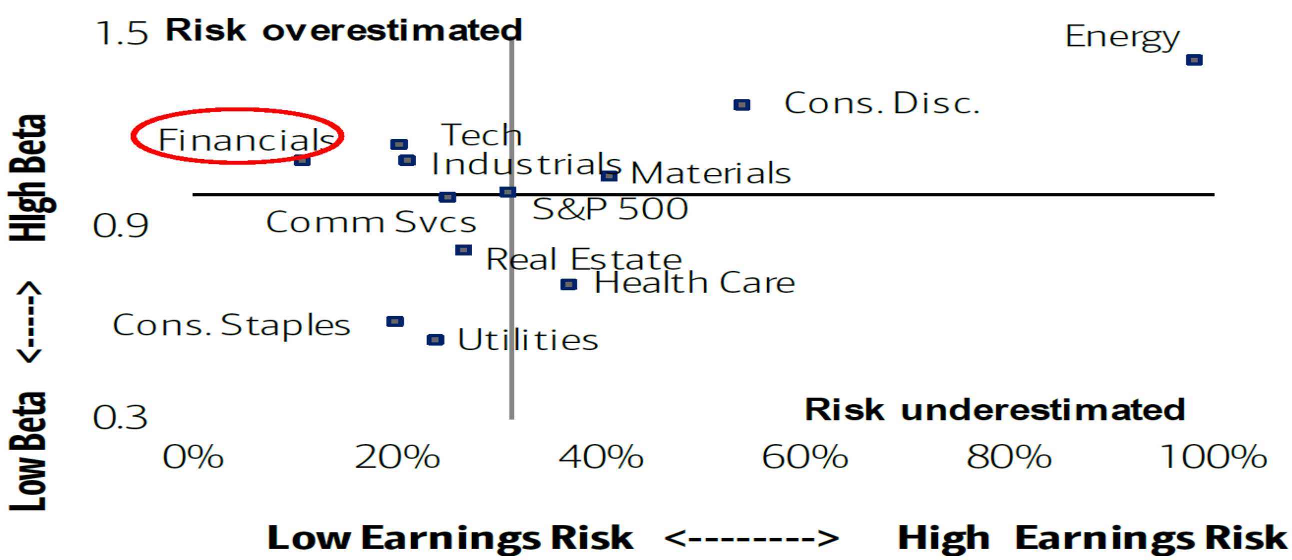
Sector	P/BV	P/OCF	Fwd P/E	EV/Sales
S&P 500 (absolute)	-23%	-24%	-5%	-32%
Comm. Svcs.	46%	38%	45%	17%
Cons. Disc.	-38%	-40%	-24%	-42%
Energy	12%	59%	83%	32%
Financials	47%	N/A	2%	135%
Health Care	32%	53%	8%	88%
Industrials	-15%	-12%	-4%	7%
Materials	25%	22%	16%	5%
Real Estate	36%	N/A	19%	10%
Staples	13%	2%	-10%	26%
Technology	-30%	-4%	-7%	-40%
Utilities	10%	-15%	-17%	-19%

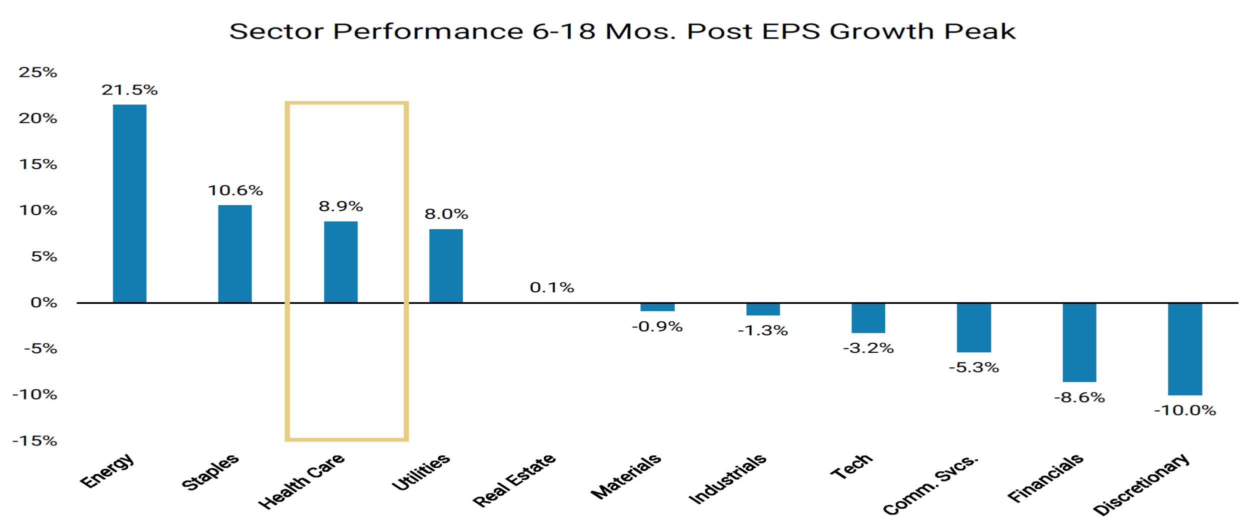


All based on current constituents unless specified	2021	Bottom-up Consensus 2022	y/y	2023	y/y
S&P 500 Pro-forma EPS (Historical Index)	**$208.1**				
S&P 500 Pro-forma EPS (Current Constituents)	**$208.3**	**$220.3**	***6%***	**$231.2**	***5%***
Sector ($ billions)					
Consumer Discretionary	132.5	120.8	*-9%*	153.1	*27%*
Consumer Staples	104.3	106.8	*2%*	110.4	*3%*
Energy	80.1	203.3	*154%*	174.0	*-14%*
Financials	331.2	265.9	*-20%*	296.2	*11%*
Health Care	291.9	305.0	*5%*	293.8	*-4%*
Industrials	107.5	135.8	*26%*	151.2	*11%*
Information Technology	384.4	399.3	*4%*	409.9	*3%*
Materials	58.3	60.8	*4%*	53.5	*-12%*
Real Estate	42.9	51.8	*21%*	53.3	*3%*
Communication Services	189.1	159.0	*-16%*	166.7	*5%*
Utilities	49.0	51.0	*4%*	54.8	*7%*
S&P 500	**1,771.3**	**1,859.6**	***5%***	**1,916.8**	***3%***
S&P 500 ex. Financials	1,440.1	1,593.8	*11%*	1,620.7	*2%*
S&P 500 ex. Energy and Financials	1,360.0	1,390.4	*2%*	1,446.6	*4%*
S&P 500 ex. Energy	1,691.2	1,656.3	*-2%*	1,742.8	*5%*
Energy Sector ($bn)	**80.1**	**203.3**	***154%***	**174.0**	***-14%***
Avg. Oil Price (wtd. blend of Brent & WTI)	*$70/bbl*				
S&P 500 Dividends (Historical Constituents, $/share)	***$60.40***				

Consumer staples and healthcare are both classic defensive sectors. Cash flows for companies in these segments are more insulated from overall economic trends. Consumer spending on things like toothpaste, diapers, soda, and pharmaceuticals tends to be fairly steady. While defensive sectors are not cheap, their relative valuations are in line with prior periods of elevated economic risks.

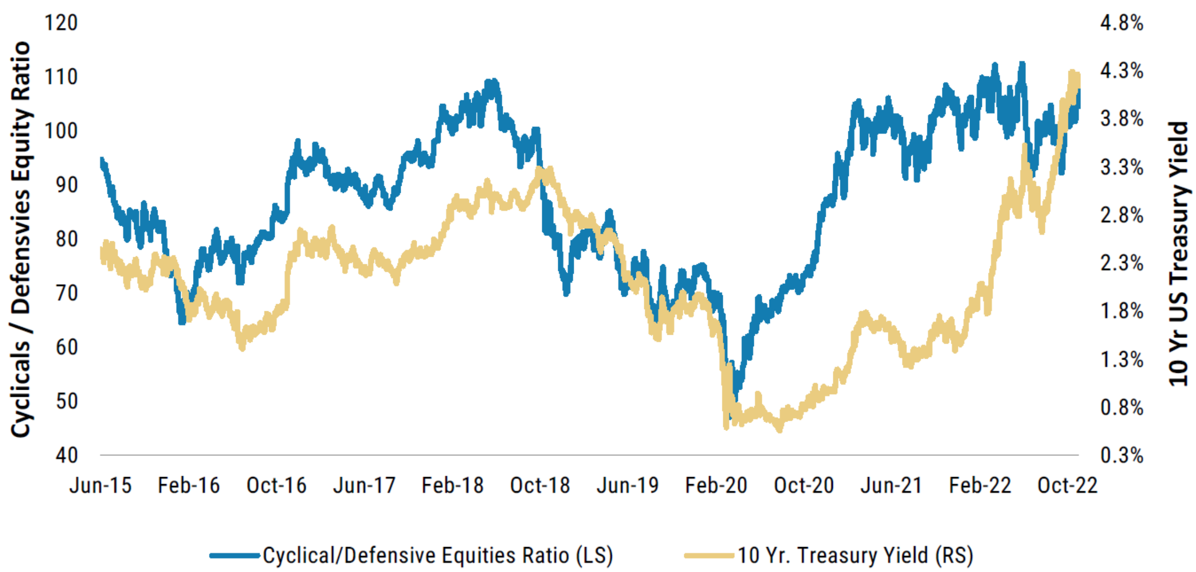


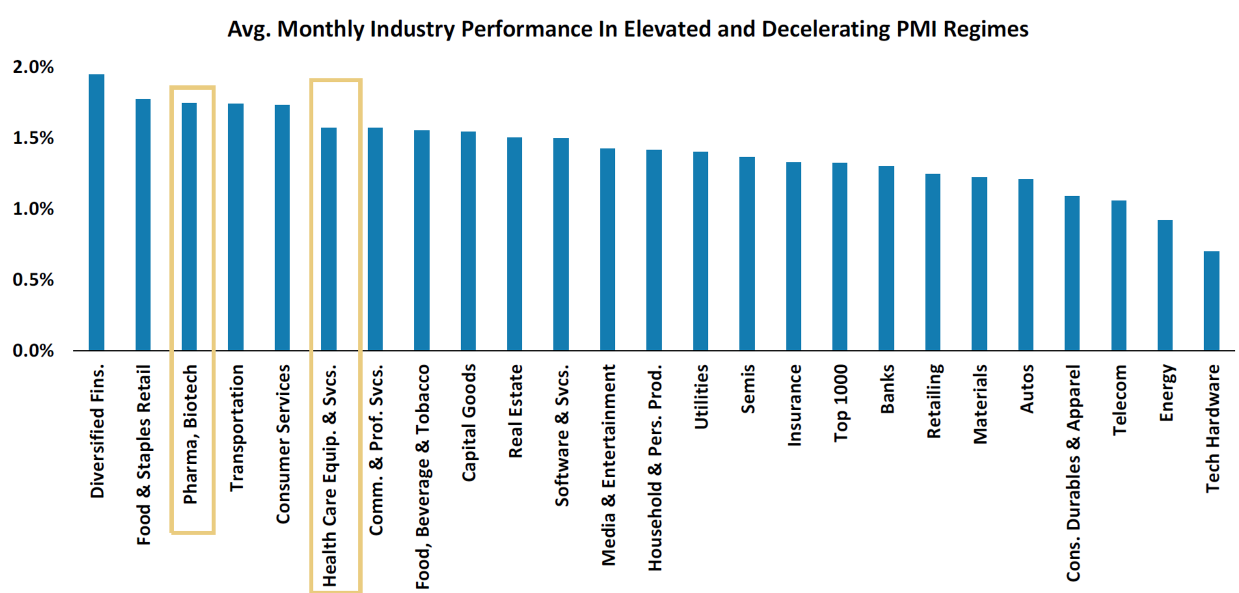




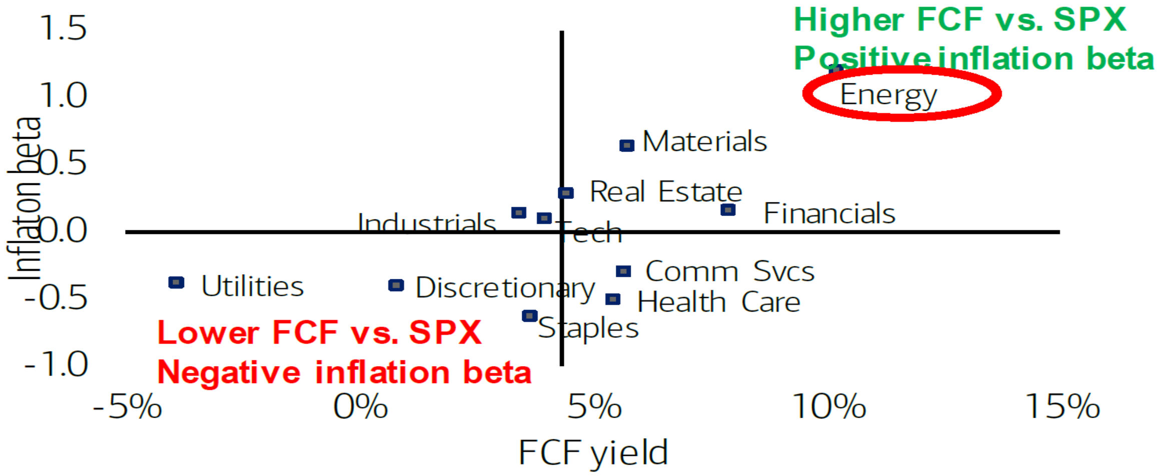
With China likely moving away from its zero-COVID policy, economic growth should pick up there. In contrast, the US economy looks poised to continue to decelerate due to aggressive Fed rate increases. Therefore, cyclicals exposed to China and non-US are likely to outperform with Materials a key China-driven sector and a weakening US Dollar would also be a positive for the group.

Financials have more exposure to US recession risk and rising funding costs weighing on net income growth and margins. Consumer Discretionary and IT were beneficiaries out of the pandemic but with spending normalizing and a higher rate environment, face the most risk to forecasts and sector valuations remain elevated. Healthcare tends to outperform in cycles with decelerating PMIs and earnings compression. Cyclical/Defensive performance versus the 10 year yield is an interesting relationship.

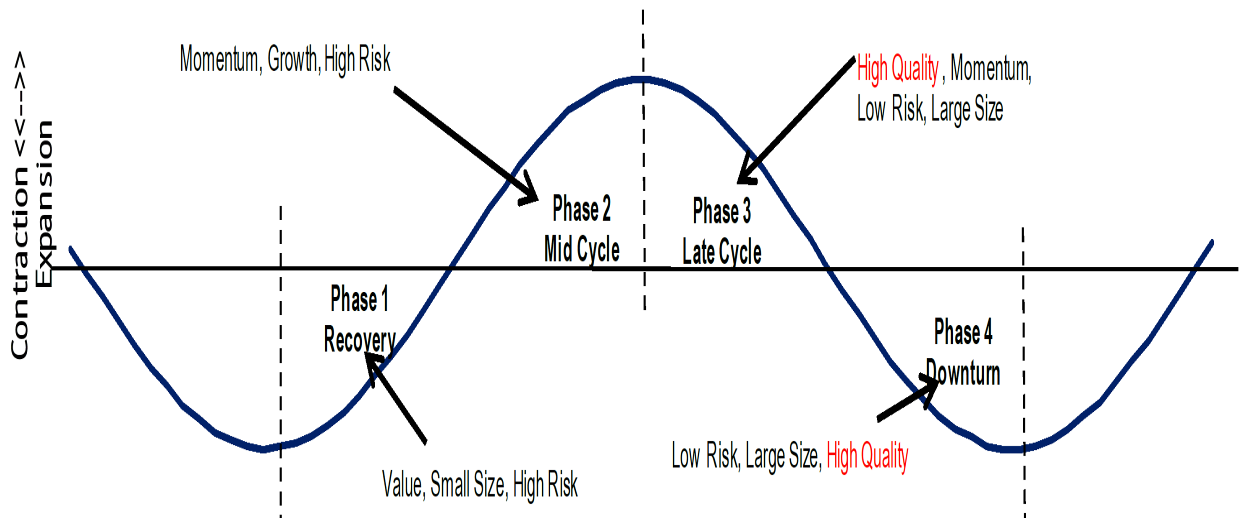


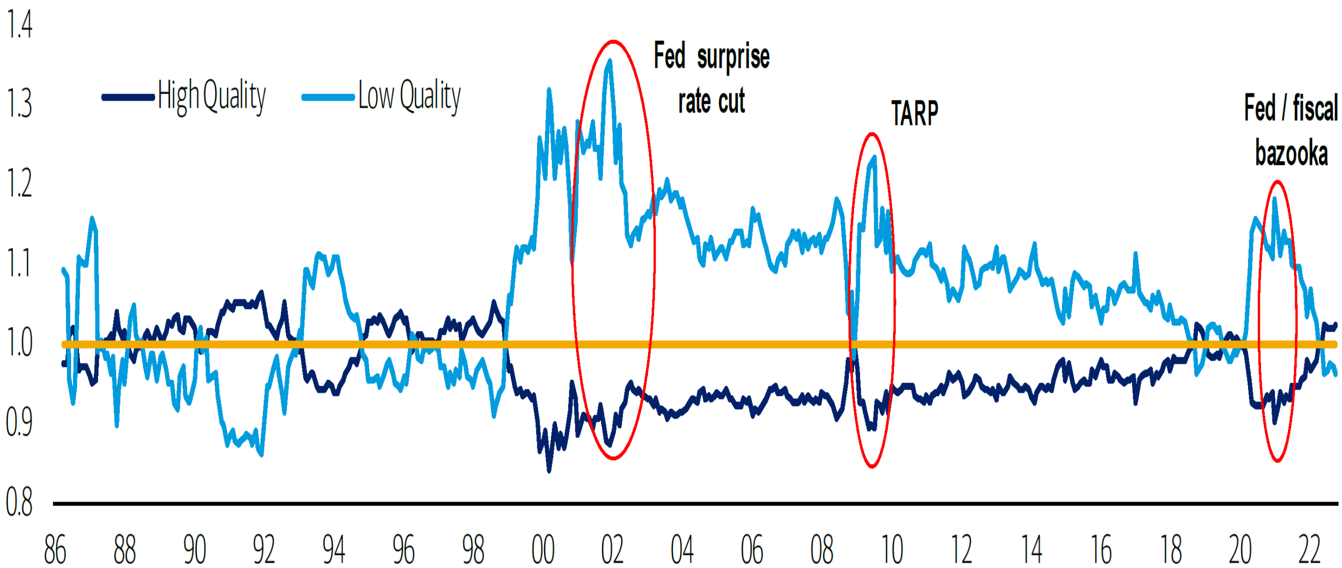


For the past 20+ years, risky stocks have traded at a premium to safe stocks, the opposite of what we learned in Finance 101 ("Investors will pay a premium for safety but require higher returns when taking risk.") Why? Fiscal and monetary stimulus buoyed risk assets amid unprecedented and quick policy responses. The converse is true as well: after a 9-month period of policy tightening, High Quality re-rated to trade at a slight premium to Low Quality. High Quality historically led Low Quality for the 6-month period prior to the last Fed hike and for six and 12-month periods *after* the last hike. Cash producing companies continue to fare well during Downturns, with FCF/ EV leading the equal weighted S&P 500 index by 5.0ppt on average.



US Regimes – a heuristic





Sell-Side 2023 Market Projections and Commentary

A Reuter's poll of 41 Wall Street strategists shows a median S&P 500 price target of 4,200. The average target of 22 strategists canvassed by Bloomberg has the S&P 500 ending next year at 4,078 points — about 7% higher than current levels. The most optimistic forecast is for a 24% increase, while the bearish view sees it slumping 11%. The cautious central case reflects the mountain of challenges from monetary tightening to the war in Ukraine and Europe's energy crisis. Since 1928, the S&P 500 has only fallen for two straight years on four occasions: The Great Depression, World War II, the 1970s oil crisis and the bursting of the dot-com bubble at the start of this century.

Citi: S&P 4000 - Over time, the US stock market has never bottomed out before an associated recession has even begun, so we regard recent equity upside as a bear market rally. CGWI predicts the weakest annual global economic growth in forty years outside of the Global Financial Crisis and the COVID shutdowns. The year ahead is likely to see A shallow US recession and worse in some other places such as the Eurozone; A recovery in Chinese growth, by contrast, as pandemic restrictions are relaxed; US inflation continuing to ease, ending 2023 at around 3.5%; The US Federal Reserve to start cutting interest rates by the second half of the year; A 10% drop in global earnings per share. The next pullback in stocks is likely to be fueled by an earnings reset, economic deceleration, and the Fed's persistent hawkish commentary. Still, we believe the June and October lows should hold. In turn, more confidence that Fed Funds could peak toward the end of Q2 2023 should mitigate severe recession fears. This drives our mid-year 3700 target. Ultimately, the S&P 500 should move higher in the second half of 2023 as the focus will shift toward 2024, which explains Citi's 4000 year-end target.

Morgan Stanley: S&P 3900. In an environment of slow growth, lower inflation and new monetary policies, expect 2023 to have upside for bonds, defensive stocks and emerging markets. 10-year Treasury yields will end 2023 at 3.5% vs. a 14-year high of 4.22% in October 2022. S&P 500 will tread water, ending 2023 around 3,900, but with material swings along the way. U.S. dollar will peak in 2022 and declines through 2023. Oil will outperform gold and copper, with Brent crude, the global oil benchmark, ending 2023 at $110. Overall, investors will need to be more tactical and pay close attention to the economy, legislative and regulatory policy, corporate earnings and valuations. In 2023, with interest rates set to decline, conditions bode well for stable and attractive bonds, as prices move in the opposite direction of yields.

Bank of America: S&P Target 4000 - The dollar should weaken over the balance of 2023, as Federal Reserve (Fed) hawkishness has likely peaked, but the dollar still has a number of tailwinds including a real yield advantage versus developed markets. The Fed and inflation are the key indicators to watch along with geoeconomic prospects in China and Europe. For investors, international Equities and U.S. companies with foreign revenue exposure could benefit from a weaker dollar, but we are cautious about tactically allocating around a dollar view given the chicken-and-egg problem. We have more conviction that a weaker dollar could serve to reinforce commodities, helping to balance demand destruction from the global cyclical slowdown. We believe the major drivers for 2023 will be falling Inflation, Fed tightening policy at first then doing a mini-pivot (the major pivot that is cutting rates comes later), corporate earnings declining and then finding some stability in the second half, and China reopening and stimulating their economy. The "inflation and rate shock" of 2022 could give way to the "earnings shock" of 2023. Companies will have to manage through a slowdown in nominal GDP, while margin pressures remain due to the persistence of higher input costs, especially for labor. Eventually layoffs could pick up, further contributing to slowing demand and moderating revenues. However, earnings decline in this cycle could be shallower than average during recessions due to healthier household and company balance sheets as a starting point. But the necessary adjustment to earnings estimates for next year is now coming through— earnings per share estimates for the S&P 500 Index are down roughly $7 since October to $235—with more to come, in our view. The S&P 500 typically reaches its bottom six months ahead of the end of a recession, and as a result, bonds appear more attractive in the first half of 2023, while the backdrop for stocks should be better in the later half. We expect the S&P to end the year at 4000 and S&P earnings per share to total $200 for the year.

S&P 500 2023 Target Models

Model	Category	Time Horizon	2023 Target	Expected Return (Annualized)	Current Weight in Forecast
BofA Fair Value Model	Fundamental/Valuation	Medium Term	3,324	-12.3%	15%
Sell Side Indicator	Sentiment	Medium Term	4,612	16.2%	20%
Fed Liquidity Framework	Macro	Medium Term	3,327	-12.2%	20%
Estimate Revisions	Fundamental/Sentiment	Short-term	4,201	7.2%	15%
Long-term Valuation Model	Valuation	Long-term	4,104	5.1%	15%
12-Month Price Momentum	Technical	Medium Term	4,341	10.3%	15%
		Official S&P 500 Target	**4,000**	**+0.8%**	

Goldman Sachs: S&P Target 4000 - Goldman Sachs strategists believe the S&P 500 could fall to the low 3000s in case the U.S. enters a recession next year. Their base-case scenario for the S&P 500 sees a drop to 3600 in the first half of the year before an H2 rally to 4000 by end of 2023. However, the selloff could extend to 3150 in case of a recession. In a recession, we expect earnings would decline by roughly 11% to $200. For context, during prior recessions the median peak-to-trough S&P 500 EPS decline was 13%. In such a scenario, we expect the S&P 500 P/E multiple would fall to 14x. Note that around prior recessions, equity prices and valuations typically troughed while analysts were still slashing their earnings forecasts. The S&P 500 could outperform if the Fed becomes more dovish and earnings prove to be more resilient than expected. In that case, the strategists sees a scenario for the S&P 500 rallying to 4700. However, with the labor market and wage growth still too hot to be consistent with the Fed's 2% inflation target, it seems unlikely that the Fed would ease substantially next year barring a severe downturn in the economic and earnings outlooks. The strategists reiterated their earlier stance that investors should own "stocks that appear likely to grow margins next year, while avoiding those with margins that are vulnerable to a rebound in SG&A expenses.

Deutsche Bank: S&P Target 4500: A bear market rally in equity markets will continue into next year before slumping as a recession in the world economy takes hold. Deutsche Bank expects a rally to 4500 in 1H23 before then retreating. Deutsche said a recession was likely to take hold from mid-year and would also be felt in credit markets where U.S. high yield spreads should widen to 860 basis points by end-2023, and euro-denominated high yield spreads should reach 930 bps. An end to the U.S. tightening cycle and a recession was viewed as more positive for Treasuries, with the 10-year yield expected to ending 2023 around current levels at 3.65%. On oil, they added that supply disruptions could temporarily lift Brent crude prices to $100 in the first quarter of next year, before declining to $80 by year-end.

Jefferies: S&P Target 4200: In 2023, we expect bond markets will be probing for the Fed's terminal rate while equity markets will be in 'no man's land' with earnings still falling as growth and margins disappoint.

CSFB: S&P Target 4050: 2023: A Year of Weak, Non-Recessionary Growth and Falling Inflation. In hindsight, 2022 marks the year when geopolitics took center stage, not only significantly impacting the global economy and financial markets, but resetting international relations and global international commerce. This has implications for short-, medium-, and long-term growth, price prospects, and monetary and fiscal policy, potentially leading to sizeable shifts in the global monetary system with reverberations in financial markets.

UBS: S&P Target 3900: With UBS economists forecasting a US recession for Q2-Q4 2023, the setup for 2023 is essentially a race between easing inflation and financial conditions versus the coming hit to growth& earnings. History shows that growth and earnings continue to deteriorate into market troughs before financial conditions ease materially. We have penciled in a 4% fall in S&P 500 EPS in 2023 to USD 215. This is well below bottom-up consensus expectations for EPS growth of 5% to USD 231 and suggests continued negative earnings revisions, a somewhat challenging backdrop for the equity market. Before a bear market bottom, usually the 2-year Treasury yield has already started declining, the equity risk premium has risen quite a bit, and investors are starting to anticipate a re-acceleration in economic and corporate profit growth.

Unfortunately, none of these conditions were met at the market low in October. We think investors have to be prepared for another leg down in this bear market in the months ahead, potentially driven by weaker corporate profits. Trends should improve in 2024. The Fed thinks the normal federal funds rate is about 2.5% compared to the current rate of 4.5%, and there are indications from the Fed that it will rise to slightly more than 5% in early 2023. So, once inflation is under control, it seems likely that the Fed will begin to cut interest rates, which should lead to a re-acceleration in corporate profit growth, which could be realized in 2024. While it appears too early to position for Fed interest rate cuts, the equity market backdrop should begin to improve at some point in 2023, perhaps in the second half. Our most preferred sectors are consumer staples, healthcare, and energy. Consumer staples and healthcare are both classic defensive sectors since consumer spending on things like toothpaste, diapers, soda, and pharmaceuticals tends to be fairly steady. And though energy has been a standout performer in 2022, we still see oil prices in the mid USD 70s/bbl as having more upside than downside potential due in part to a likely rebound of demand in China, Saudia Arabia's budgetary interest in a price above USD 80/bbl and potential US interest in refilling its Strategic Petroleum Reserve. Within cyclicals, we prefer global versus domestic segments, and we have downgraded financials to least preferred status and upgraded materials to neutral.

BMO Capital: S&P Target 4300: We still expect a December S&P 500 rally even if stocks do not hit our 4,300 2022 year-end target. Unfortunately, we believe it will be difficult for stocks to finish 2023 much higher than current and anticipated levels given the ongoing tug of war between Fed messaging and market expectations. For all intents and purposes, 2022 will likely be remembered within the world of investing as the year when reality truly did bite. Long gone are the days following the Great Financial Crisis of monetary slack and mostly easy gains for both stocks and bonds. Earnings for S&P 500 companies may contract by roughly 5% to $220 a share in 2023 from this year given the macro circumstances. Fortunately, we think this is well understood by investors and believe that the market will care more about falling inflation than a slight earnings decline – and maybe even more so than the prospect of a mild recession.

Barclays: S&P Target 3765: We acknowledge some upside risks to our scenario analysis given post-peak inflation, strong consumer balance sheets and a resilient labor market. However, current multiples are baking in a sharp moderation in inflation and ultimately a soft landing, which we continue to believe is a low probability event. Our analysts expect the world to grow at 1.7% next year, a big slowdown from the 6%+ growth of 2021 and a significant drop from the 3.2% growth expected for 2022. Inflation will likely fall slowly, with consumer prices worldwide rising at a 4.6% average next year. Despite 2022's drawdown, our analysts believe that global equity markets have room to drop further. They observe that US stocks tend to bottom out 30-35% below peak in the middle of a recession. That suggests fair value of 3200 on the S&P500 sometime in H1 23. European valuations look more reasonable, but that is offset by a considerably worse macro outlook than in the US. Bonds have massively underperformed equities in 2022, and our analysts now see limited downside in longer US fixed income. If forced to choose between stocks and bonds, they would be overweight core fixed income over equities. But cash should be the real winner of 2023, with US front-end yields likely to go to 4.5% or higher and stay there for several quarters. The ability to earn over 4% while taking virtually no risk is a factor that should drag on both stock and bond markets next year.

Oppenheimer: S&P Target 4400: Our earnings projection of $230 for the S&P 500 calls for a P/E multiple of 19X with near flat earnings growth in 2023. Inflation stateside continuing to trend lower showing the Fed's efforts are having effect in curbing untoward levels of inflation experienced since late 2021 through this year. Expectations that China will have some success in a new round of economic re-openings as its officials provide some stimulus for the economy and loosen the stringent COVID zero-tolerance policy which has hurt their domestic economy and has delayed the process of addressing supply chain disruptions which have challenged the economies of China's trading partners around the world. Bearish sentiment remains widespread among market participants stateside not withstanding signs of resilience in the economy which could likely reduce the likelihood of a stateside recession or at least reduce the depth and length of a recession should a recession be realized.

JP Morgan: S&P Target 4200: We expect market volatility to remain elevated (VIX averaging ~25) with another round of declines in equities, especially after the run-up into year-end that we have been calling for and the S&P 500 multiple approaching 20x. More precisely, in 1H23 we expect S&P 500 to re-test this year's lows as the Fed overtightens into weaker fundamentals. This sell-off combined with disinflation, rising unemployment, and declining corporate sentiment should be enough for the Fed to start signaling a pivot, subsequently driving an asset recovery, and pushing S&P 500 to 4,200 by year-end 2023. There is good and bad news for equity markets and more broadly risky asset classes in 2023. The good news is that central banks will likely be forced to pivot and signal cutting interest rates sometime next year, which should result in a sustained recovery of asset prices and subsequently the economy by the end of 2023. The bad news is that in order for that pivot to happen, we will need to see a combination of more economic weakness, an increase in unemployment, market volatility, decline in levels of risky assets and a fall in inflation. All of these are likely to cause or coincide with downside risk in the near term.

Wells Fargo: S&P Target 4300 to 4500: Our single and consistent message since early 2022 has been to play defense in portfolios, which practically means making patience and quality the daily watchwords. Holding tightly to those words implies that long-term investors, in particular, can use patience to turn time potentially to an advantage. As we await an eventual economic recovery, the long-term investor can use available cash to add incrementally and in a disciplined way to the portfolio. Wells Fargo Investment Institute expects the U.S. and global economies to face a moderate recession through the summer in 2023 followed by a second-half recovery capable of extending into 2024. Our forecasts for the recession to end in mid-2023, inflation to cool, and the Fed to begin easing policy should lead to improving investor sentiment and higher price/earnings (P/E) multiples. Investors should anticipate the late-2023 to 2024 economic and earnings recovery to send equity prices higher. Similar to prior early cycles (2009 and 2020), equity prices likely will increase much more rapidly than earnings can recover, leading to above-average P/E multiples. However, once earnings catch up to prices, the multiple should normalize at a lower level. The chart below shows historical calendar-year contributions to return for the S&P 500 Index compared with our forecasts for 2022 and 2023. We continue to prefer balance, patience, and a tilt toward quality, both across equity sectors and at the sub-industry level. Our favored sectors remain Information Technology (IT), Health Care, and Energy, while we remain unfavorable on the highly cyclical Consumer Discretionary sector and the interest-rate-sensitive Real Estate sector.

RBC: S&P Target 4100: We think the path to 4,100 is likely to be a choppy one in 2023, with a potential retest of the October lows early in the year as earnings forecasts are cut, Fed policy gets closer to a transition (stocks tend to fall ahead of final cuts), and investors digest the onset of a challenging economy. Even if the economy goes in to recession next year, with history as a guide, the equity market would likely begin a new bull market cycle before the recession ends. Moderating inflation data, negative investor sentiment around October lows, and the fact the S&P 500 has almost always delivered strong, positive returns for months following the U.S. midterm elections could mean a rally in equity prices over the next few weeks or months. Investors could see the equity market continue to rally into 2023, then give way to another period of falling share prices and subsequently tick back up later in the year. Going into 2023, investors should consider leaning more heavily toward quality and sustainable dividends and away from individual company risks. Small-cap and midcap segments are attractive due to their valuation discounts and because they are likely to benefit as economic green shoots start to emerge.

Gold Technical View and Analysis

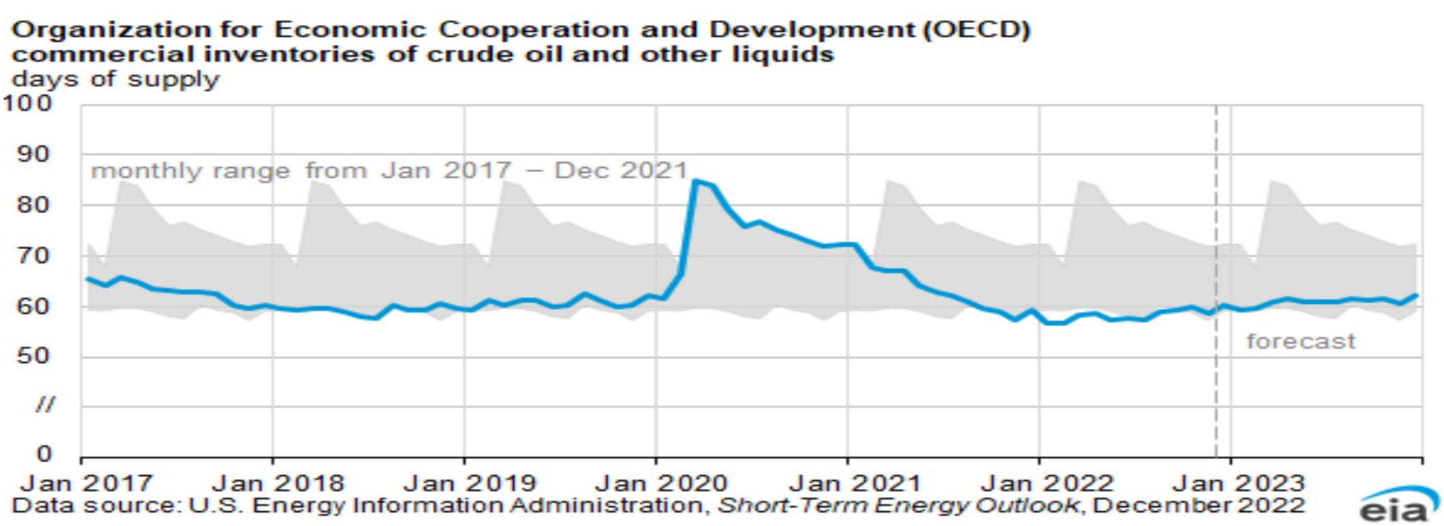
Gold has rallied back to its 200-day moving average since early November and is also touching potential resistance at VWAP off the March highs and major volume resistance at the 171 level for GLD. A move above that level can set up for a return to 180/185 resistance zone and possible upside break away from the three-year trading range. If GLD slip sunder the $162 level it can retrace back to 156.50 level and a volume pocket exists way back to 143.5.

A stagflation scenario would likely lead to outperformance in Gold while the Fed navigating a "soft-landing" would favor a rally in risk assets and be challenging for gold returns. Going forward, this interplay between inflation and central-bank intervention will be key in determining the outlook for 2023 and gold's performance. Mild recession and weaker earnings have historically been gold-positive and further weakening of the dollar as inflation recedes could provide support for gold while geopolitical flare-ups should continue to make gold a valuable tail risk hedge. So far this year central banks have continued to increase gold reserves. During times of economic and geopolitical uncertainty and high inflation, banks appear to be turning to gold as a store of value. The latest data from the World Gold Council (WGC) shows that central banks increased their buying of gold significantly over the third quarter. Central banks bought 399 tonnes in 3Q22, which is up 341% year-on-year and also a record quarterly amount. The pace at which central banks have accumulated gold reserves this year has not been seen since 1967. Chinese gold demand suffered earlier in the year due to the Covid-related lockdowns, particularly over the second quarter of the year, which is when strict restrictions were in place across Shanghai and Beijing. According to WGC data, Chinese consumer demand was down 23% YoY over 1H22. For another key gold consumer, India, demand remained strong in October amid the onset of festivals and weddings season with both jewelry and bar and coin purchases boosted. Global gold ETF holdings saw their sixth consecutive monthly decline in October, standing at 3,490t (US$184bn) at the end of the month. North American funds led global outflows. Speculative positioning in COMEX gold further highlights the lack of investor interest – the latest COMEX exchange numbers showed that speculators in US gold futures were betting on lower prices, however, the number of the bets had declined.

Oil Technical View and Analysis

Crude Oil broke a long uptrend in August and has been trending lower with a few failed rally attempts. The 8/21 week bear cross occurred in late July as a signal of the momentum ending after a parabolic move higher. The $70 level is a key longer-term support and a 50% retracement of the range while a strong VPOC at $63 and longer-term key volume node near $53. I believe the $60 level should hold as key support but if it slips below there is a large volume pocket back to $45. Th downward-sloping 21-week is likely resistance on bounces, currently just under $85 and VWAP off the June highs has also acted as resistance. A move back above $90.50 would likely inflect Oil back into bull mode and set up for a move to $110.

The EIA expects that falling global inventories of oil in early 2023 will push Brent prices back above $90/b by the beginning of the second quarter of 2023 (2Q23). It sees some downward oil price pressure could emerge in the second half of 2023 (2H23) based on a forecast of rising oil inventories, that pressure will likely be balanced by the ongoing possibility of supply disruptions or production growth that is slower than forecast. He EIA forecasts the Brent crude oil spot price will average $92/b for all of 2023. Significant uncertainty remains around the impact that sanctions on Russia will have on global oil prices. The EU ban on seaborne imports of crude oil from Russia took effect on December 5, and the ban on petroleum product imports is set to begin on February 5. About half of global oil production growth in 2023 is expected to come from the United States, where total production is forecast to increase by about 1 mb/d. China is expected to account for more than half the oil demand growth in 2023. OPEC forecasts suggest that the largest increases to demand are likely to come from China and India. These economies are expected to grow somewhere between 5% and 6% respectively in 2023. Total supply increases of oil in 2023 are expected to fall short of demand side growth, albeit marginally. This suggests a moderate uplift in prices from current levels (as of the end of 2022). The major upside 'risks' to oil prices find form in escalating geopolitical tensions (ongoing and still threatening), and the possibility of a faster than expected economic recovery in China (should covid policy see increased and more permanent relaxation). A major input which could catalyze a sharp fall in crude pricing, would be if there was a de-escalation of the ongoing Russia / Ukraine war, suggesting that a flurry of supply might eventually be allowed back into the broader market place.

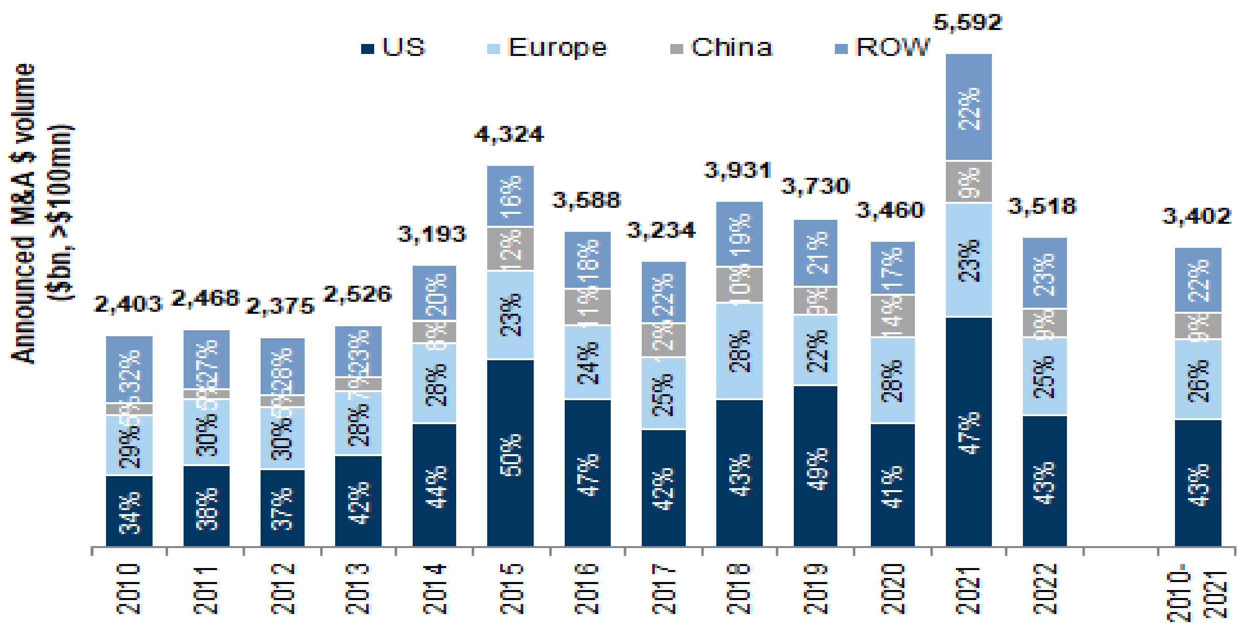


124 M&A Candidates for 2023

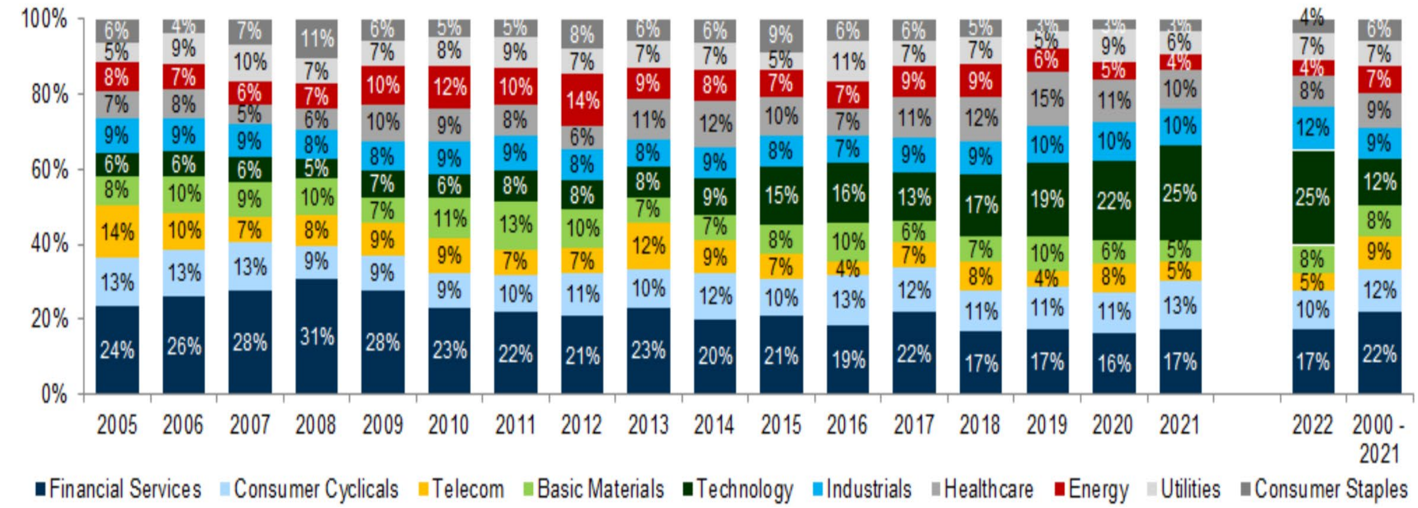
WWE, WIX, RVNC, BL, AMLX, UNVR, AXTA, CEIX, LPI, MTDR, MGY, USAC, PUMP, MNTK, MOD, CELH, FRPT, SPTN, VGR, PBH, SHOO, CLAR, GPRO, VZIO, PTON, VRNS, VFC, LGF.B, ALKS, RPD, RRC, APAM, PIPR, PAYO, RPAY, IMXI, ENV, NSA, RXDX, CYTK, BPMC, RCKT, SGEN, RCUS, DICE, AXSM, PRTA, PCVX, ISEE, VRDN, SLP, HAE, QGEN, QTRX, MOH, ADUS, IART, ATEC, NARI, SILK, MASI, EMBC, VRAY, MAXR, AJRD, AVAV, ALG, HEES, TGLS, PGTI, SUM, ADT, HCCI, SNCY, R, CAL, SFM, MANU, SEAT, SCPL, WEN, ZIP, UNF, LAUR, INSE, NGMS, EXEL, NTNX, FROG, DV, CVT, BL, VERX, APPF, OSPN, RAMP, PRGS, SPSC, CVLT, RNG, CHGG, AVID, QLYS, TENB, RPD, PINC, NXGN, HSTM, ADTN, CMBM, EXTR, DGII, ATEN, TTMI, VPG, YELP, PINS, MYTE, TRIP, ACLS, NXPI, SMTC, SYNA, PLAB, WOW, EVRG

2022 M&A Review

M&A volumes are seen closing the year down 37% from 2021 levels but still 3% higher than the average over the past decade. Sponsor M&A has comprised 36% of deals compared to the 232% historical average.

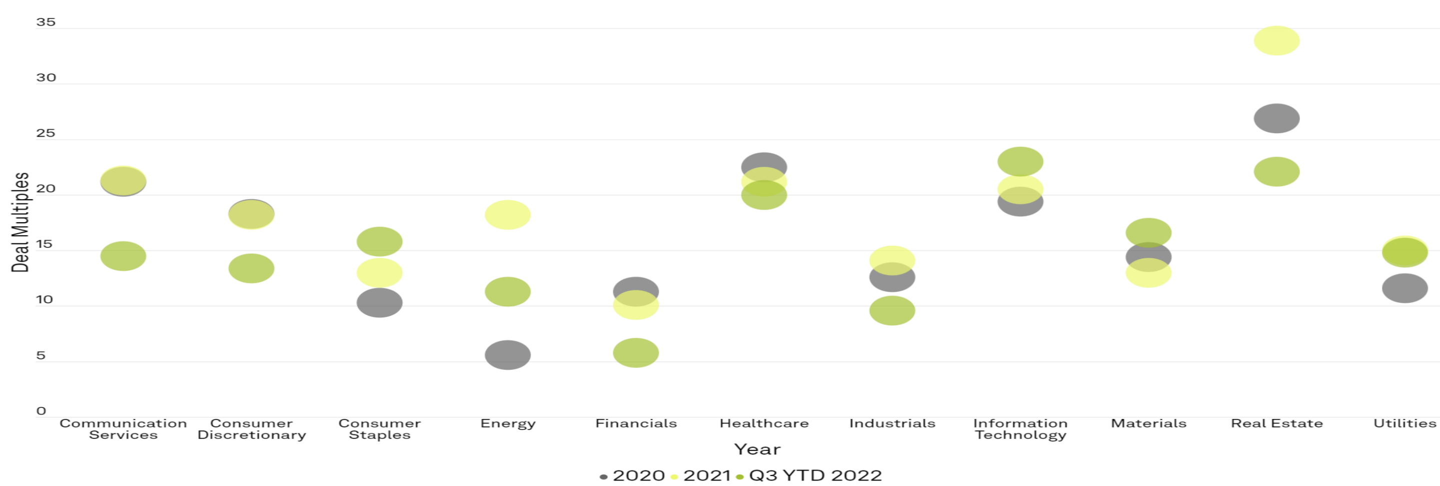


Deals by sector are broken down below. Despite a steep drop in deal volume from Q2 to Q3, software remained the No. 1 industry in the M&A world for the 10th-consecutive quarter in Q3 2022. M&A deals involving targets in the software industry reached their highest deal volume in Q2 2022 ($178 billion) before dropping 49% to $91.4 billion in Q3 2022.



Deal Multiples by Sector

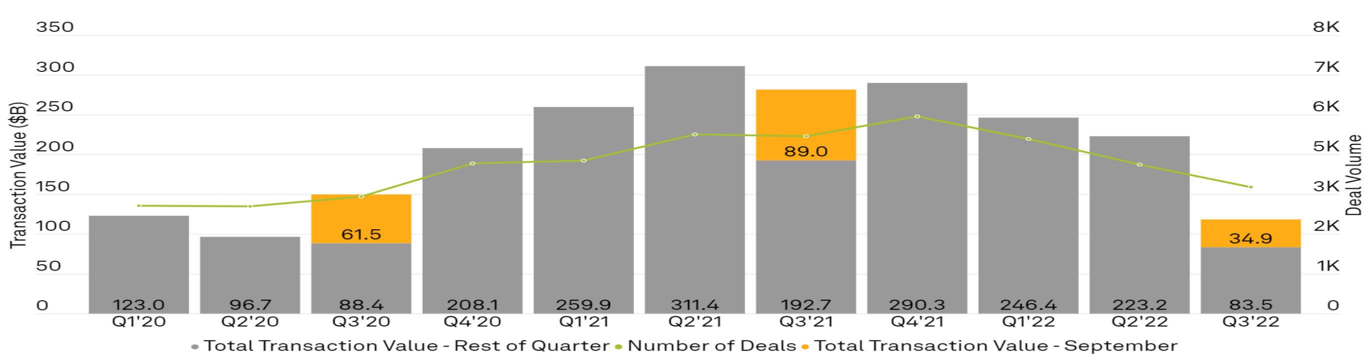
Implied Enterprise Value/EBITDA, 2020 - YTD through Q3 2022



A steep fall in large private-equity buyouts contributed to the slowdown in global dealmaking, with third-quarter activity dropping 54% to $716.62 billion from $1.56 trillion in the same period last year, according to Dealogic data. Corporate confidence in markets being supportive of dealmaking - widely seen as the leading indicator for M&A activity - has plummeted as a long-lasting recession is looming. Going forward dealmakers expect more domestic tie-ups, mostly funded by stock, to help companies withstand the storm. Lengthy regulatory reviews have pressured buyers to offer so-called reverse break-up fees they would need to pay if they were unable to consummate the deal.

Global Private Equity and Venture Capital Entries

Total Transaction Value ($B) by Quarter, September YoY



The largest deals in 2022 were:

- **Microsoft (MSFT)** announced a $68.7B deal for **Activision (ATVI)** which remains under review
- **Elon Musk** acquired **Twitter (TWTR)** for $43B
- **Adobe (ADBE)** announced a $20B deal for Figma which remains under review
- **Broadcom (AVGO)** announced a $61B deal for **Vmware (VMW)** which remains under review
- **ProLogis (PLD)** announced a $24B deal for **Duke Realty (DRE)**
- **Amgen (AMGN)** announced a $27.8B deal for **Horizon Pharma (HZNP)**
- **Kroger (KR)** announced a $24.6B deal for **Albertson's (ACI)** which remains under review
- **Healthcare Realty (HR)** announced an $18B deal for **Healthcare Trust (HTA)**
- **Philip Morris (PM)** announced a $16B deal for **Swedish Match**
- **Brookfield (BAM)** announced a $16B deal for **Nielsen (NLSN)**
- **J&J (JNJ)** announced a $16.6B deal for **Abiomed (ABMD)**
- **Vista Equity** announced a $16.5B deal for **Citrix (CTXS)**
- **Blackstone (BX)** announced a $14B deal for **Emerson (EMR)** Climate Segment
- **GIC** and **Oak Street** announced a $14B deal for **STORE Capital (STOR)**
- **Royal Bank (RY)** announced a $13.5B deal for **HSBC (HSBC) Canada**
- **Toronto Dominion (TD)** announced a $13.4B deal for **First Horizon (FHN)**
- **Intercontinental (ICE)** announced a $13.1B deal for **Black Knight (BKI)**
- **Take Two (TTWO)** announced a $12.7B deal for **Zynga (ZNGA)**
- **Poseidon** did an $11B deal for **Atlas (ATCO)**
- **Digital Bridge** announced an $11B deal for **Switch (SWCH)**
- **Celanese (CE)** announced an $11B deal for **DuPont (DD)** Mobility Segment
- **Pfizer (PFE)** announced an $11.6B Deal for **BioHaven (BHVN)**
- **Berkshire (BRK.B)** announced an $11.6B deal for **Allegheny (Y)**
- **Thoma Bravo** announced a $10.7B deal for **Anaplan (PLAN)**
- **Hellman, Friedman and Permira** announced a $10.2B deal for **ZenDesk (ZEN)**
- **Thoma Bravo** acquired **Coupa (COUP)** for $8B
- **Max Linear (MXL)** acquired **Silicon Motion (SIMO)** for $8B
- **Vista Equity** acquired **Avalara (AVLR)** for $8.4B
- **Brookfield (BBU)** acquired **CDK Global (CDK)** for $8.3B

A few other notable deals by sector included:

Healthcare:

Date	Acquired Co.	Sector	Industry	Acquirer	Deal Size
9/5/2022	Signify (SGFY)	Healthcare	Healthcare IT	CVS (CVS)	$8B
8/8/2022	Globall Blood (GBT)	Healthcare	Biotech	Pfizer (PFE)	$5.4B
3/29/2022	LHC Group (LHCG)	Healthcare	Home Health	United Health (UNH)	$5.4B
8/4/2022	ChemoCentrx (CCXI)	Healthcare	Biotech	Amgen (AMGN)	$4B
5/25/2022	Covetrus	Healthcare	Animal Health	Clayton, Dubilier and Rice	$4B
6/3/2022	Turning Point (TPTX)	Healthcare	Biotech	Bristol Myers (BMY)	$4.1B
1/10/2022	Cloudmed	Healthcare	Healthcare IT	R1 (RCM)	$4.1B
7/21/2022	One Medical (ONEM)	Healthcare	Healthcare IT	Amazon (AMZN)	$3.9B
4/21/2022	Humana Hospice Care	Healthcare	Home Care	Clayton, Dubilier and Rice	$3.4B
10/24/2022	Myovant (MYOV)	Healthcare	Biotech	Sumitovant Bio	$2.9B
10/31/2022	BindingSite	Healthcare	Life Science Tools	Thermo Fisher (TMO)	$2.6B
8/1/2022	PerkinElemer (PKI) Applied, Food	Healthcare	Life Science Tools	New Mountain Capital	$2.45B
5/31/2022	Affinivax	Healthcare	Biotech	GlaxoSmithKline (GSK)	$2.1B
4/13/2022	Sierra Oncology (SRRA)	Healthcare	Biotech	GlaxoSmithKline (GSK)	$1.9B
1/19/2022	Zogenix (ZGNX)	Healthcare	Biotech	UCB	$1.9B
1/10/2022	Apria (APR)	Healthcare	Medical Equipment	Owen and Minor (OMI)	$1.6B
7/7/2022	Meridian (VIVO)	Healthcare	MedTech	SD Biosensor and SJL Partners	$1.53B
6/6/2022	Parata Systems	Healthcare	Healthcare IT	Becton Dickinson (BDX)	$1.52B
11/21/2022	Imago (IMGR)	Healthcare	Biotech	Merck (MRK)	$1.35B
4/18/2022	Natus Medical (NTUS)	Healthcare	Med-Tech	ArchiMedi	$1.29B
7/21/2022	Hanger (HNGR)	Healthcare	Medical Services	Patient Square Capital	$1.25B
9/12/2022	PharmaLex	Healthcare	Healthcare Services	AmerisourceBergen (ABC)	EUR1.28B
9/1/2022	Forma Therapeutics (FMTX)	Healthcare	Biotech	Novo Nordisk (NVO)	$1.1B
6/21/2022	Convey Health (CNVY)	Healthcare	Healthcare IT	TPG	$1.1B
2/15/2022	Sound United	Healthcare	Med-Tech	Masimo (MASI)	$1.02B
4/13/2022	Antares Pharma (ATRS)	Healthcare	Biotech	Halozyme (HALO)	$960M
6/23/2022	Radius Health (RDUS)	Healthcare	Generics	Paitent Square	$890M
9/19/2022	RX Savings Solutions	Healthcare	Digital Health	McKesson (MCK)	$875M
2/8/2022	Cook Medical Reproductive	Healthcare	Medical Devices	Cooper (COO)	$875M
8/23/2022	Aerie (AERI)	Healthcare	Biotech	Alcon (ALC)	$770M
11/28/2022	Apollo Endo (APEN)	Healthcare	Medical Devices	Boston Scientific (BSX)	$615M
10/18/2022	Akouos (AKUS)	Healthcare	Biotech	Eli Lilly (LLY)	$610M
10/18/2022	AVEO Oncology (AVEO)	Healthcare	Biotech	LG Chem	$566M
4/7/2022	ReViral	Healthcare	Biotech	Pfizer (PFE)	$525M
2/14/2022	Bio Delivery (BDSI)	Healthcare	Biotech	Collegium (COLL)	$500M

Tech:

Date	Acquired Co.	Sector	Industry	Acquirer	Deal Size
8/26/2022	MicroFocus (MFGP)	Tech	Software	Open Text (OTEX)	$6B
4/11/2022	Sailpoint (SAIL)	Tech	Software	Thoma Bravo	$6.9B
3/8/2022	Mandiant (MNDT)	Tech	Software	Google (GOOG)	$5.4B
2/15/2022	Tower Semi (TSEM)	Tech	Semiconductors	Intel (INTC)	$5.4B
9/19/2022	KnowBe4 (KNBE)	Tech	Software	Vista Equity	$4.47B
1/11/2022	Wind River	Tech	Software	Aptiv (APTV)	$4.3B
8/30/2022	Frontline Education	Tech	Software	Roper (ROP)	$3.725B
3/28/2022	Poly (POLY)	Tech	Communication Equipment	HP (HPQ)	$3.3B
1/6/2022	Vocera (VCRA)	Tech	Network Equipment	Stryker (SYK)	$3.09B
12/6/2022	Vivint (VVNT)	Tech	Smart Home	NRG Energy (NRG)	$2.8B
8/3/2022	Ping Identity (PING)	Tech	Software - Cybersecurity	Thomas Bravo	$2.8B
10/11/2022	ForgeRock (FORG)	Tech	Software	Thomas Bravo	$2.3B
6/14/2022	MEDIFOX DAN	Tech	Healthcare Software	ResMed (RMD)	$1B
4/4/2022	Pensando	Tech	Software	AMD (AMD)	$1.9B
9/28/2022	BTRS Holding	Tech	Software	EQT X Fund	$1.7B
10/27/2022	UserTesting (USER)	Tech	Software	Thomas Bravo	$1.3B
8/2/2022	Sierra Wireless	Tech	Semi	Semtech (SMTC)	$1.2B
2/15/2022	Linode	Tech	Software	Akamai (AKAM)	$900M

Consumer:

Date	Acquired Co.	Sector	Industry	Acquirer	Deal Size
11/7/2022	IAA (IAA)	Consumer Services	Business Services	Richie Bro (RBA)	$7.3B
2/23/2022	Tenneco (TEN)	Consumer Goods	Auto Parts	Apollo Funds	$7.1B
2/22/2022	Tegna (TGNA)	Consumer Services	Media	Standard General	$5.4B
12/12/2022	Weber (WEBR)	Consumer Goods	Home Goods	BDT Capital	$3.7B
2/22/2022	Meritor (MTOR)	Consumer Goods	Auto Parts	Cummins (CMI)	$3.7B
1/31/2022	Bungie	Consumer Discretionary	Media - Videogames	Sony (SONY)	$3.6B
5/5/2022	Deliverr	Consumer Discretionary	Ecommerce	Shopify (SHOP)	$2B
6/20/2022	Clif Bar	Consumer Goods	Snacks	Mondelez (MDLZ)	$2.9B
11/15/2022	Tom Ford	Consumer Goods	Apparel	Estee Lauder (EL)	$2.8B
2/22/2022	Houghton Mifflin (HMHC)	Consumer Services	Education Services	Veritas Capital	$2.8B
2/22/2022	Peninsula Pacific Entertainment	Consumer Services	Gaming	Churchill Downs (CHDN)	$2.485B
2/24/2022	KAR Auction Biz (KAR)	Consumer Discretionary	Dealerships	Carvana (CVNA)	$2.2B
1/25/2022	Bally's (BALY)	Consumer Discretionary	Gaming	Standard General	$2.24B
8/5/2022	I-Robot (IRBT)	Consumer Goods	Home Products	Amazon (AMZN)	$1.7B
4/25/2022	Ricolino	Consumer Goods	Snacks	Mondelez (MDLZ)	$1.3B
10/3/2022	Poshmark (POSH)	Consumer Discretionary	Ecommerce	Naver	$1.2B
7/5/2022	Valora Holding	Consumer Goods	Food & Beverage	FEMSA (FMX)	$1.2B
4/6/2022	Main Event	Consumer Discretionary	Restaurants	Dave and Busters (PLAY)	$835M
1/11/2022	Sunshine Fitness	Consumer Services	Health, Education, Child	Planet Fitness (PLNT)	$800M
6/13/2022	Radisson Hotel	Consumer Discretionary	Travel & Leisure	Choice Hotel (CHH)	$675M
9/6/2022	ChannelCommerce	Business Services	Marketing	CommerceHub	$665M
9/6/2022	Hero Mighty Patch	Consumer Goods	Household & Personal Care	Church and Dwight (CHD)	$630M
5/2/2022	LeoVegas	Consumer Discretionary	Gaming	MGM (MGM)	$607M
2/7/2022	First Alert (Newell)	Consumer Goods	Home Products	Resideo (REZI)	$593M
1/6/2022	The Athletic	Consumer Services	Print Media	NY Times (NYT)	$550M
7/6/2022	Fox Racing	Consumer Goods	Sporting Goods	Vista Outdoor (VSTO)	$540M
6/6/2022	PrimaLoft	Consumer Goods	Apparel	Compass Diversified (CODI)	$530M

Energy/Materials:

Date	Acquired Co.	Sector	Industry	Acquirer	Deal Size
8/17/2022	DCP Midstream (DCP)	Energy	Midstream	Phillips 66 (PSX)	$7.2B
3/7/2022	Oasis Petro (OAS)	Basic Mate	Oil & Gas	Whiting Petrol (WLL)	$6B
5/31/2022	Yamana Gold (AUY)	Basic Mate	Precious Metals	Gold Fields (GFI)	$6.7B
11/18/2022	OZ Minerals	Basic Mate	Metals	BHP (BHP)	$6.34B
3/14/2022	Turquoise Hill (TRQ)	Basic Mate	Metals	Rio Tinto (RIO)	$5.4B
9/6/2022	Tug Hill Assets	Basic Mate	Oil & Gas	EQT (EQT)	$5.2B
9/6/2022	Brigham (MNRL)	Basic Mate	Oil & Gas	Sitio (STR)	$4.8B
11/9/2022	Howden	Basic Mate	Energy Services	Chart Industries (GTLS)	$4.4B
10/17/2022	Archaea Energy (LFG)	Energy	Renewables	BP (BP)	$4.1B
5/16/2022	CHI Overhead Doors	Materials	Building Materials	Nucor (NUE)	$3B
3/28/2022	Neenah Paper (NP)	Basic Mate	Packaging and Paper	Schweitzer Mauduit	$3B
6/16/2022	Lucid Energy	Basic Mate	Oil and Gas	Targa (TRGP)	$3.55B
1/10/2022	Navitas Midstream	Basic Mate	Energy - Midstream	Enterprise (EPD)	$3.25B
2/28/2022	Renewable Energy (REGI)	Basic Mate	Energy	Chevron (CVX)	$3.15B
11/28/2022	Nature Energy Biogas	Basic Mate	Renewables	Shell (SHEL)	$2B
7/6/2022	Resolute Forest (RFP)	Materials	Lumber	Domtar	$2.7B
8/1/2022	Valvoline (VVV) Global Products	Energy	Refiners	Saudi Aramco	$2.65B
7/28/2022	CSP	Materials	Steel	Arcelor (MT)	$2.2B
5/16/2022	Rattler (RTLR)	Energy	Midstream	Diamondback (FANG)	$2.2B
6/3/2022	Barrette Outdoor Living	Materials	Building Materials	CRH (CRH)	$1.9B
7/25/2022	Shell Midstream (SHLX)	Energy	Midstream	Shell (SHEL)	$1.96B
8/9/2022	Validus Energy	Basic Mate	Oil & Gas	Devon (DVN)	$1.8B
7/27/2022	Grupo Gondi	Materials	Paper & Packaging	WestRock (WRK)	$1.763B
4/20/2022	DSM's Protective Materials Business	Materials	Chemicals	Avient (AVNT)	$1.485B
10/18/2022	Gelnex	Materials	Renewables	Darling (DAR)	$1.2B
7/28/2022	{BF Logistics (PBFX)	Energy	Midstream	PBF (PBF)	$1.2B
11/30/2022	Stoller Group	Basic Mate	Ag	Corteva (CTVA)	$1.2B
9/22/2022	Enven Energy	Materials	Oil & Gas	Talos Energy (TALO)	$1.1B
11/1/2022	Liquibox	Materials	Packaging	Sealed Air (SEE)	$1.15B
6/8/2022	RimRock Oil & Gas	Basic Mate	Oil & Gas	Devon (DVN)	$865M
8/9/2022	Huntsman (HUN) Textiles	Materials	Chemicals	Archroma	$716M

Industrial/Utility:

Date	Acquired Co.	Sector	Industry	Acquirer	Deal Size
2/24/2022	South Jersey (SJI)	Utility	Natural Gas	Infrastructure Investments	$8.1B
10/11/2022	Westinghouse Electric	Industrial	Electrical Products	Cameco (CCJ) , Brookfield (BEP)	$7.775B
7/28/2022	Spirit Air (SAVE)	Industrial	Airlines	JetBlue (JBLU)	$7.6B
8/4/2022	Atlas Air (AAWW)	Industrial	Transports - Air Freight	Apollo (APO)	$5.2B
12/16/2022	Maxar Tech (MAXR)	Industrial	Defense Equipment	Advent International	$4B
12/19/2022	Aerojet Rocketdyne (AJRD)	Industrial	Defense	LH3 Harris (LHX)	$4.7B
5/16/2022	ManTech (MANT)	Industrial	Defense IT	Carlyle (CG)	$4.2B
8/8/2022	InSinkErator (EMR)	Industrial	Industrial Equipment	Whirlpool (WHR)	$3B
4/5/2022	Spirit Air (SAVE)	Industrial	Transports - Airlines	Jet Blue (JBLU)	$3.3B
11/14/2022	Ahern Rental	Industrial	Equipment	United Rental (URI)	$2B
7/11/2022	Euronav (EURN)	Industrial	Transports - Shipping	Frontline (FRO)	$2.5B
2/14/2022	Cornerstone (CNR)	Industrial	Building Materials	CD&R	$2.4B
2/9/2022	US Ecology (ECOL)	Industrial	Waste Mgmt.	Republic (RSG)	$2.2B
3/3/2022	Welbilt (WBT) Ice Business	Industrial	Machinery	Pentair (PNR)	$1.6B
2/14/2022	Elkay	Industrial	Machinery	Zurn Water (ZWS)	$1.56B
11/17/2022	ServiceMax	Industrial	Industrial Tech	PTC (PTC)	$1.46B
7/25/2022	Infrastructure and Energy (IEA)	Industrial	E&C	MasTec (MTZ)	$1.1B
10/27/2022	Altra Industrial (AIMC)	Industrial	Motion and Control	Real Rexnord (RRX)	$4.95B
12/2/2022	Emtek and Schaub	Industrials	Building Materials	Fortune Brands (FBHS)	$800M
2/22/2022	Clipper Logistics	Industrial	Transports - Logistics	GXO (GXO)	$943M
4/22/2022	Stanley (SWK) Access Tech	Industrial	Tools	Allegion (ALLE)	$900M
3/25/2022	XPO Intermodal Business	Industrial	Logistics	STG	$710M
4/8/2022	C&K Switches	Industrial	Equipment	Littlefuse (LFUS)	$540M
4/27/2022	Fill Rite	Industrial	Machinery	Gorman-Rupp (GRC)	$525M

Financial:

Date	Acquired Co.	Sector	Industry	Acquirer	Deal Size
4/25/2022	PS Business Parks (PSB)	Financial	REITS	Blackstone (BX)	$7.6B
2/16/2022	Preferred Apartments (APTS)	Financial	REITS	Blackstone (BX)	$5.8B
8/1/2022	EVO Payments (EVOP)	Financial	Payments	Global Payments (GPN)	$4B
1/3/2022	Teraco	Financial	Data Center REIT	Digital Realty (DLR)	$3.5B
2/15/2022	Moneygram (MGI)	Financial	Payments	Madison Dearborn	$1.8B
8/2/2022	Cowen	Financial	Asset Mgmt.	TD Bank (TD)	$1.3B
2/22/2022	Technisys	Financial	Fin-Tech	Sofi (SOFI)	$1.1B
11/1/2022	BenefitFocus (BNFT)	Financial	Asset Mgmt.	VOYA Financial (VOYA)	$750M
3/17/2022	CarVal	Financial	Alternative	Alliance Bernstein (AB)	$750M
2/7/2022	Finxact	Financial	Payments	Fiserv (FISV)	$650M
2/22/2022	Verisk (VRSK) Financial	Financial	Fin-Tech	Transunion (TRU)	$515M

OptionsHawk Top Stocks for 2023

The sections below break down the best-looking stocks for 2023 considering valuation, forward growth, operating efficiency and the industry backdrop as well as company idiosyncratic drivers. Before getting into the curated lists, I want to first present the complete list after breaking down each industry group individually as you will see in the Sector & Industry breakdown part of the report. This is just a list that may be handy for creating watchlists in 2023. The best way to learn more about any of the stocks mentioned in this report is by becoming a member at OptionsHawk where we have years of commentary across all tickers right on the website and our new application. Throughout 2023 the OptionsHawk Weekly Radar Report that is released each Sunday and packed with trade ideas and prep work for the week ahead will do a featured profile of one of the micro-cap companies.

High Quality Stocks but Not at this Value/Time – These are stocks that are high-quality names but either the valuation or timing is not right to own them for the expected 2023 softening economic backdrop. This is likely the case for many stocks but want to keep a list handy of names that could quickly become attractive into weakness.

STLD, ALB, HWM, APTV, PG, AAPL, FRC, WAL, AFG, RYAN, BLK, LPLA, SPGI, PLD, ARE, EQIX, VRTX, REGN, NVO, ZTS, MCK, TMO, DHR, RMD, PODD, ISRG, HON, UPS, DE, TTC, AME, IEX, WMS, WTS, ROP, AZPN, HUBB, ALLE, SSD, PHM, TTEK, POOL, ROL, WM, AQUA, CP, KNX, ODFL, LSTR, ORLY, FIVE, LOW, NFLX, SPOT, NYT, LYV, ACN, ADP, CTAS, HUBS, BILL, PAYC, SHOP, SNOW, TEAM, DASH, BSY, ZS, CRWD, APH, TDY, PI, ETSY, TER, NVDA, LSCC, ONTO, NVMI, AWK

2023 Top Large & Mid Stocks – These are the stocks that screened the strongest across each of the industry groups with market caps above $8B.

CEG, IRM, BGNE, ARGX, HZNP, RPRX, CVS, SNA, TDG, SPG, HUBB, SPOT, DD, APD, RPM, FMC, CTVA, DAR, CCK, SCCO, NUE, STLD, TECK, GOLD, COP, EOG, APA, SLB, PAA, TRGP, MPC, FSLR, ENPH, RACE, CPRT, MNST, STZ, MDLZ, LW, SJM, ARMK, PM, EL, LULU, CPRI, GRMN, AXON, IBN, BAP, WFC, USB, FHN, CB, MET, WRB, AJG, PGR, APO, CG, SCHW, TW, STT, MA, FLT, FDS, AON, IT, FICO, CSGP, Z, MAA, PEAK, VICI, KIM, WY, SBAC, IRM, UTHR, EXAS, ARGX, BGNE, BIIB, BMRN, BNTX, ALNY, MRK, RDY, ABC, IQV, A, TECH, BRKR, UNH, HUM, BSX, SWAV, STE, TFX, DXCM, COO, BAH, LDOS, RTX, GD, BA, TDG, CAT, URI, PH, AME, ROK, NDSN, PNR, WAB, MSI, KEYS, PTC, CSL, GWW, CARR, JCI, MLM, PWR, WDAY, RSG, DAL, CNI, AZO, ROST, COST, DG, TSCO, FND, ULTA, DIS, WMG, TTWO, CMG, SBUX, INFY, EPAM, PAYX, PLNT, HLT, HGV, LVS, CZR, RCL, ORCL, MSFT, DDOG, NICE, VRSN, INTU, MANH, UBER, SNPS, ADSK, PANW, PSTG, ANET, TEL, FLEX, PDD, MELI, BKNG, ABNB, KLAC, TSM, GFS, MRVL, AVGO, ADI, QCOM, LSCC, TMUS, RCI, AES, CNP, XEL, NFE, EDR

Top 2023 Out of Favor Value Buys – This is a list I put together of names that screened as cheap values to peers and overall strong financial metrics that can be a three-to-five-year recovery and re-rate play.

DOW, WLK, PKG, STLA, BWA, WGO, KHC, HAS, EQH, TROW, CBOE, AXP, GPN, HST, SNY, VTRS, DGX, HCA, MDT, HOLX, GE, ITT, TRMB, WCC, GNRC, SNA, POOL, CLH, DLTR, WSM, FOXA, EA, CTSH, TNET, CMCSA, MGM, FFIV, GDDY, SSNC, CHKP, HPQ, CAJ, STX, JNPR, MTCH, GOOGL, BIDU, BABA, NXPI, SWKS, CHTR, EIX, VST

Top 2023 Shorts – These are names that screened both as overvalued and with weaker growth outlooks while being susceptible to downward earnings revisions and/or multiple compression in 2023.

FTDR, NXST, SHW, MOS, UAN, CVGW, TSN, FNV, XOM, KMX, KDP, MKC, KMB, ONON, BEN, BAM, SQ, MSCI, CACC, ELS, HR, SLG, IONS, IDXX, PCRX, AVTR, RGEN, CVS, DVA, UHS, SYK, EW, NVCR, WST, ALGN, ITW, GGG,

XYL, ICE, ANSS, MHK, TREX, FAST, BLD, OTIS, AAL, JBHT, ZTO, CHRW, FIVE, HD, WBA, BBY, KR, CASY, SIRI, WBD, RBLX, DPZ, SHAK, CHH, DKNG, HTZ, MTN, LMND, NOW, NABL, NET, MDB, CFLT, TTD, GLBE, TYL, GWRE, AYX, HCP, TWLO, ZM, DUOL, VEEV, U, PCOR, ALTR, PLTR, NTAP, ST, LAZR, FVRR, SNAP, AMZN, SE, CHWY, EXPE, TCOM, ASML, AEIS, NVDA, MPWR, WOLF, QRVO

Top 2023 Small Cap Longs – These were the best stocks through the screening process with market caps under $8B.

SMCI, ATKR, CLFD, ORCC, STWD, HALO, KYMR, IONS, ANIK, BLTE, VRDN, ACHC, ATKR, FLR, CDRE, FC, XPOF, PACB, STNE, COHR, EXTR, ASH, OLN, AIN, NGVT, LXU, MGPI, INGR, KRT, SEE, NXE, EAF, MP, HCC, KALU, KMT, CRS, AGI, NFG, VET, HP, ERII, ENLC, SHLS, NOVA, ENS, AMPS, BE, FOXF, ALSN, FSS, SHYF, BC, DOOO, ABG, NAPA, SMPL, RLX, TPB, TPX, YETI, DTC, LOVE, IPAR, ELF, CROX, GOOS, UEIC, MODG, BMA, PB, UMPQ, KNSL, VOYA, PLMR, WDH, BRP, ACT, GSHD, FHI, FOCS, AMK, VINP, STEP, SF, PX, NVEI, STNE, COOP, CIGI, HHC, ENVA, FSK, AAT, NXRT, BNL, CHCT, LTC, EGP, EPR, SHO, KRC, KRG, STWD, AKRO, VRNA, KROS, PHAT, QURE, HALO, IMCR, ACLX, PRVB, ITCI, KRTX, CERE, HRMY, INSM, RYTM, KNSA, BLTE, AMPH, MEDP, AZTA, STVN, CTKB, OLK, ABCM, ACHC, PRVA, AMEH, EHC, ENSG, GMED, ENOV, NARI, INSP, UFPT, NVST, SGHT, STAA, PGNY, INMD, LNTH, PRCT, TMDX, ESTA, KBR, MAXR, HXL, DCO, AL, LNN, HEES, RRX, KAI, SXI, RBC, ZWS, ESE, BMI, CTOS, ATKR, TGLS, AWI, PGTI, AAON, GFF, EPAC, NSSC, ASPN, SKY, TPH, MTZ, FLR, DY, PRIM, FSV, CWST, HCCI, CPA, SNCY, HTLD, SAIA, GXO, GLNG, DHT, VVV, DRVN, ARHS, BOOT, FCFS, HIBB, TITN, RSVR, BOWL, CNK, WING, ARCO, TXRH, PLAY, FWRG, OUT, GLOB, NSIT, DAVA, PRFT, VVI, ICFI, CBZ, ABM, CDRE, ATGE, AFYA, BFAM, XPOF, CHDN, LNW, SRAD, SIX, DOCN, FROG, DV, IBEX, INTA, ESMT, SQSP, CWAN, MLNK, ALKT, INFA, DSGX, SPSC, BOX, CVLT, FIVN, KARO, PWSC, INST, MODN, JAMF, AGYS, AVID, CEVA, NATI, QLYS, NTCT, DOCS, HQY, EVH, SMCI, ADTN, CALX, EXTR, DGII, CLFD, FN, ATEN, SANM, TTMI, VPG, LQDT, MYTE, ACLS, CRDO, MTSI, ALGM, AOSL, AEHR, COHR, PLAB, IRDM, CCOI, ORA, PNM, PAM, CWT, SBS

These were some top themes that emerged as potential big ideas for 2023:

- Short Peak Lithium Prices
- Short Packaged Food on Tough Comps, Elevated Valuations and Margin Risk
- Short Auto Dealers on Weakening Pricing & Units
- Long Auto Parts on Cheap Valuations and Easing Supply Constraints with 2024 Accelerated Growth
- Long Solar on Strong Demand, Easing Supply Constraints and IRA Impact
- Long India, Latin America Banks for Positive Earnings Revisions, Capex Cycle / Short Canadian Banks on Housing Meltdown
- Long Reinsurance on Higher Rates, ROEs, and Pricing
- Long Alt. Capital vs. Traditional Asset Mgmt. on Retail opportunity in Private Markets
- Long Exchanges/Brokers on Elevated Trading Volumes, Higher Rates
- Long Rating Agencies (MCO, SPGI) on trough issuances/originations
- REITS: Long Lodging, Industrial, Apartments, Shopping / Short Infrastructure, Healthcare, Malls, Triple Net, Office
- Long Tower Stocks as FX/Rates Peak, Power Costs Roll Over
- Short Truckers on Weaker Pricing, Macro Backdrop
- Long Aerospace for Further Recovery and China Reopening
- Long Defense IT on Valuations and Budget Upside w/ Modernization
- Long Electrification Theme Industrials
- Short Building Products on Slowing R&R & Housing Starts
- Short Industrial Distributors on Normalizing Supply Chains and Inflation

- Short Homebuilders on Weak Demand & Margin Pressures from Sales Incentives
- Short Truckers on Weaker Demand, Peak Pricing; Short Truck Brokers on Spot Rates, Earnings Contraction
- Short Home Goods Retail and Home Improvement on Negative Earnings Revisions / Favor Off-Price and Warehouses for Consumer Environment
- Long Video Games as Defensive, Cheap Valuations, Higher Installed Base, Better Slate of Titles
- Short Economy Lodging (CHH, WH)

Top 35 Long Investments for 2023 in Large/Mid Cap Stocks – The first step in portfolio construction is determining our sector weightings. Into a weaker Macro it makes sense to be more defensive with stronger allocations to Healthcare/Staples while elevated bond yields make sectors like Utilities/REITs less attractive to investors. Tech continues to face headwinds from slower spending and rising rates and a strong US Dollar. Basic Materials tend to be tied to China which is a wildcard in 2023 as the economy is a mess but also trying to pump in a ton of stimulus. Based on these factors weightings for 2023 that appear optimal are Healthcare 15%, Materials 7.5%, Energy 7.5%, Consumer Discretionary/Cyclical 10%, Consumer Goods 15%, Financials 12.5%, REITs 5%, Industrials 10%, Tech 12.5%, Utilities 5%.

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE	ENTRY 1/2	ENTRY 2/2	TARGET	STOP
UNH	UnitedHealth Group Inc	489.3B	16.06X	1.57X	10.02%	8.48%	9.62%	10.2%	$525.00	$500.00	$650.00	$450.00
ABC	AmerisourceBergen Corp.	33.8B	9.86X	0.14X	5.3%	6.37%	1.21%	17.1%	$150.00	$125.00	$200.00	$110.00
BSX	Boston Scientific Corporation	65.6B	20.25X	5.82X	5.96%	0.0%	25.55%	8.77%	$42.50	$39.00	$55.00	$35.00
BMRN	Biomarin Pharmaceutical Inc	20.2B	75.46X	9.55X	22.37%	69.75%	(0.478%)	(0.591%)	$95.00	$85.00	$135.00	$77.50
MRK	Merck & Co Inc	276.9B	11.67X	5.01X	(1.794%)	8.3%	37.15%	24.02%	$95.00	$85.00	$130.00	$78.00
APD	Air Products & Chemicals, Inc.	70.2B	16.37X	5.62X	5.61%	11.1%	19.61%	9.56%	$280.00	$265.00	$420.00	$220.00
TECK	Teck Resources Ltd (USA)	19.2B	3.60X	1.80X	(17.068%)	(0.364%)	30.58%	36.59%	$33.00	$28.00	$45.00	$25.00
CTVA	Corteva Inc	42.7B	14.20X	2.49X	6.26%	9.74%	(2.557%)	(0.713%)	$57.00	$50.00	$80.00	$44.00
EOG	EOG Resources Inc	73.9B	4.88X	2.77X	5.04%	(9.023%)	49.0%	34.65%	$115.00	$95.00	$170.00	$83.00
SLB	Schlumberger NV	70.0B	12.47X	2.86X	16.29%	13.19%	15.8%	11.74%	$44.00	$39.00	$60.00	$33.00
BKNG	Booking Holdings Inc	75.2B	14.42X	4.45X	13.21%	13.86%	43.62%	58.31%	$1,900.00	$1,800.00	$2,800.00	$1,675.00
MELI	MercadoLibre Inc	42.4B	36.04X	4.16X	22.76%	41.49%	11.0%	16.1%	$825.00	$700.00	$1,400.00	$600.00
LVS	Las Vegas Sands Corp.	36.3B	55.44X	10.76X	91.32%	31.62%	(14.428%)	(3.614%)	$42.00	$39.00	$60.00	$34.00
AZO	Autozone Inc	44.7B	13.30X	2.95X	4.92%	6.59%	18.14%	35.27%	$2,300.00	$2,150.00	$2,800.00	$1,950.00
PM	Philip Morris International Inc.	155.5B	13.23X	5.83X	2.04%	12.11%	41.46%	51.47%	$92.00	$86.00	$125.00	$82.00
SJM	J M Smucker Co	16.6B	13.08X	2.50X	2.37%	5.69%	17.21%	8.12%	$145.00	$135.00	$180.00	$120.00
MNST	Monster Beverage Corp	52.6B	29.75X	7.81X	11.3%	12.23%	25.73%	18.12%	$95.50	$87.00	$120.00	$79.00
CPRI	Capri Holdings Ltd	7.4B	7.15X	1.54X	5.29%	4.84%	19.83%	16.25%	$52.00	$45.00	$75.00	$39.00
APO	Apollo Global Management Inc	35.8B	11.17X	10.23X	36.44%	13.99%	(44.948%)	(1.857%)	$59.00	$52.00	$85.00	$48.00
IBN	ICICI Bank Ltd (ADR)	75.9B		7.88X	16.09%		64.35%	1.8%	$20.00	$16.00	$28.00	$14.50
SCHW	Charles Schwab Corp	146.0B	45.77X	25.30X	11.9%	6.88%	53.27%	1.46%	$74.00	$65.00	$105.00	$60.00
MA	Mastercard Inc	332.5B	25.44X	15.29X	12.88%	16.81%	57.66%	44.74%	$335.00	$315.00	$445.00	$295.00
RTX	Raytheon Technologies Corp	144.6B	15.28X	2.59X	7.91%	14.5%	11.72%	5.62%	$92.00	$85.00	$120.00	$79.00
BAH	Booz Allen Hamilton Holding Corporation	13.7B	15.66X	1.73X	7.4%	7.2%	11.21%	17.33%	$95.00	$88.00	$125.00	$77.00
EDR	Endeavor Group holdings Inc	5.8B	4.97X	1.09X	10.41%	12.44%	16.89%	7.75%	$20.00	$15.00	$30.00	$13.00
PH	Parker-Hannifin Corp	36.7B	12.54X	2.80X	5.5%	8.39%	19.64%	11.51%	$280.00	$255.00	$375.00	$230.00
SBAC	SBA Communications Corporation	30.3B	24.01X	16.15X	3.95%	4.6%	35.97%	10.92%	$275.00	$250.00	$425.00	$230.00
CSGP	CoStar Group Inc	31.7B	41.99X	12.82X	14.71%	21.7%	21.76%	4.81%	$74.00	$69.00	$115.00	$64.00
CEG	Constellation Energy Corp	28.8B	12.72X	1.61X	(12.751%)	8.25%	(0.661%)	(0.248%)	$75.00	$68.00	$110.00	$60.00
NFE	New Fortress Energy Inc	9.2B	12.32X	5.20X	51.68%	51.9%	25.51%	9.92%	$44.00	$38.00	$70.00	$29.00
FSLR	First Solar, Inc.	16.5B	69.36X	5.62X	28.76%	83.09%	(10.868%)	(3.279%)	$135.00	$120.00	$185.00	$99.00
MSI	Motorola Solutions Inc	42.2B	17.96X	5.30X	6.73%	8.57%	28.49%	28.91%	$240.00	$225.00	$300.00	$190.00
AVGO	Broadcom Inc	236.0B	12.17X	7.48X	3.68%	4.66%	61.59%	31.21%	$515.00	$480.00	$740.00	$430.00
WDAY	Workday Inc	45.0B	27.60X	6.85X	17.18%	16.62%	17.58%	44.46%	$165.00	$150.00	$230.00	$140.00
PTC	PTC Inc	14.5B	19.56X	7.97X	10.76%	15.47%	40.26%	16.46%	$81.00	$75.00	$110.00	$67.00

Below I provide a brief synopsis of each stock and some rationale for how it qualified to be a top stock:

UnitedHealth (UNH) offers a full range of health benefits, enabling affordable coverage, simplifying the health care experience, improving consumer health, advancing health equity and delivering access to high-quality care. Optum is an information and technology-enabled health services business serving the broad health care marketplace. UNH has a $500B market cap and always screens as a best-in-class name with the value-based care theme a key driver. UNH trades 21X Earnings, 1.6X Sales and 19.65X FCF with a 1.25% dividend yield. UNH revenues are seen rising another 10% in 2023 with 13% EPS growth. UNH recently held an Investor Day and continues to progress with its consumer first strategy with OptumRx passing Humira Biosimilar cost savings directly to the consumer. Management is optimistic on future MA membership growth and comfortable with potential RADV/2024 rate notice risk. OptumHealth's revenue per consumer served continues to improve with expected growth of +24-28% in 2023. UNH should also see accretion from its Change Healthcare deal in 2023.

AmerisourceBergen (ABC) is one of the largest global pharmaceutical sourcing and distribution services companies, helping both healthcare providers and pharmaceutical and biotech manufacturers improve patient access to products and enhance patient care. Pharmaceutical sales in the United States are expected to grow at a compound annual growth rate of approximately 4.5% from 2021 through 2026. Generic pharmaceuticals currently account for approximately 90% of the prescription volume in the United States and Biosimilars is seen to be a major growth area moving forward. ABC has a $35B market cap trading 13.2X Earnings, 10X EBITDA and 19.2X FCF with a 1.16% yield and revenues seen growing 5%+ annually with 10% EPS growth. ABC offers cheap valuation with steady growth and upside growth optionality while the Walgreens (WBA) stake sale overhang is starting to abate. ABC has a strong positioning in specialty for this group that can allow it to continue to beat expectations.

Boston Scientific (BSX) develops, manufactures, and markets medical devices for use in various interventional medical specialties worldwide. It operates through three segments: MedSurg, Rhythm and Neuro, and Cardiovascular. BSX sees globalization and geographic expansion as a big driver over the next 1-2 years and seeing strong growing in some early areas like China where Rezum has been approved. BSX trades 23.6X Earnings, 5.2X Sales and expects steady 6-8% revenue growth with 10-12% EPS growth. BSX recently did a deal to expand its presence in China and is also entering a very strong product cycle in 2023. BSX is performing better than its large cap peers and as FX headwinds abate it should be a strong performer in 2023.

BioMarin (BMRN) is a global biotechnology company that develops and commercializes innovative therapies for people with serious and life-threatening rare diseases and medical conditions. Voxzogo for the treatment of children with achondroplasia has been the focus with a long-term view of $8B to $10B in revenues. BMRN also has five other revenue producing products. BMRN potential approval of their DMD genetherapy for Hemophilia A is seen as the major 2023 catalyst. The FDA has accepted BioMarin's refiling of BLA for Roctavian in the US with PDUFA on March 31, 2023. BMRN has a $20B market cap and trades 10X Sales and 33X FY23 EBITDA with revenues seen rising 20%+ each of the next three years and significant profit growth.

Merck (MRK) with a spectacular year in 2022 gaining more than 40% continues to screen as the best positioned Pharma company. MRK is a global health care company that delivers innovative health solutions through its prescription medicines, vaccines, biologic therapies and animal health products. MRK's Pharma segment has turned in an Oncology juggernaut with the success of Keytruda while Gardasil and Januvia are its other top contributors. MRK spun-out its Organon business sin June for women's health, biosimilars and established brands. MRK has a $275B market cap and trades 14.5X Earnings, 4.7X Sales and 33.3X FCF with a 2.67% yield. MRK's ability to replace the revenue the company will lose from Keytruda when the drug loses patent protection later this decade will be in focus and the company is likely to remain active with M&A. The

FDA has accepted the Keytruda sBLA for adjuvant NSCLC (based on KN-91) and issued a PDUFA date of Jan 29, 2023. MRK is conducting a Ph3 trial of Keytruda SQ formulation vs. IV, with data expected in 1Q23, potentially allowing for additional IP. Subcutaneous formulation for Keytruda could extend exclusivity well past 2028. MRK's near-term growth profile is likely to keep it as a top performer in Pharma.

Air Products (APD) provides essential industrial gases, related equipment and applications to customers in various industries, including refining, chemical, metals, electronics, manufacturing, and food and beverage. Last week APD announced plans to invest approximately $500 million to build, own and operate a 35 metric ton per day facility to produce green liquid hydrogen at a greenfield site in Massena, New York, as well as liquid hydrogen distribution and dispensing operations. APD has a $70B market cap and trades 25.25X Earnings, 5.5X Sales and 16X EBITDA with a 2% dividend yield. APD has pricing power and can perform better than other chemical groups in a tough industrial activity backdrop with revenues seen growing 5% and EPS 10% the next two years. APD's efforts in hydrogen are likely to see a boost from IRA while China reopening can also be a positive tailwind in 2023.

Teck Resources (TECK) is a natural resources company focused on copper, zinc, steelmaking coal, and energy. TECK is a key producer of copper, one of the largest producers of mined zinc, the 2nd largest seaborne exporter of steelmaking coal and also has other interests. Steelmaking Coal is 38% of revenues & 35% of profits, Zinc is 30% and 29%, and Copper is 27% and 44% respectively. In September, TECK had a structural failure of the plant feed conveyor belt at its Elkview steelmaking coal operation in the Elk Valley of British Columbia. TECK announced in mid-September an agreement with Agnico Eagle (AEM) for 50/50 JV on San Nicholas copper-zinc project in Mexico. TECK has a $19B market cap and trades 8.3X Earnings, 4.8X FY23 EBITDA and 5.8X FCF with a 1% dividend. TECK has new management and the ramp-up of QB2 during 2023 remains the top priority while they continue to review their asset portfolio, focusing on copper growth, while maintaining current production levels within the coal and zinc businesses. TECK is an intriguing play in Metal due to the potential Copper growth in the years ahead.

Corteva (CTVA) is the preferred Ag play into 2023 as it is more protected from the peak earnings facing fertilizer names from unusually tight markets in 2022. Corteva is a leading global provider of seed and crop protection solutions focused on the agriculture industry and contributing to a healthier, more secure and sustainable food supply. Corteva has one of the broadest and most productive new product pipelines in the agriculture industry. New products are crucial to solving farmers' productivity challenges amid a growing global population while addressing natural resistance, regulatory changes, safety requirements and competitive dynamics. CTVA has a $43B market cap and trades 19X Earnings, 12X EBITDA and yields 1% with revenues seen rising 6% in 2023 with 15% EBITDA growth. CTVA recently announced an interesting $1.2B deal for Stoller Group which is accretive. CTVA is fairly recession proof and continues to outperform expectations.

EOG Resources (EOG) is a large cap Oil & Gas producer with assets in the US, Trinidad & Tobago, China, and Oman. At December 31, 2020, EOG's total estimated net proved reserves were 3,220 million barrels of oil equivalent (MMBoe), of which 1,514 million barrels (MMBbl) were crude oil and condensate reserves, 813 MMBbl were NGLs reserves and 5,360 billion cubic feet (Bcf), or 893 MMBoe, were natural gas reserves with 98% located in the US. EOG's main operations are South Texas with the Eagle Ford shale and Delaware Basin. EOG has a $74B market cap trading < 5X EBITDA, 3X Book and 14X FCF with a 2.6% yield. In what is likely to be a more challenging year for E&P names, EOG stands out with scale, operational efficiency, strong supply chain management, and attractive inventory depth, which supports more resilient through-the-cycle free cash flow. EOG is a shale technology leader and its premium drilling program demonstrates the company's ability to enhance returns on legacy assets through optimization. EOG also benefits from elevated global LNG prices through its gas supply contract with Cheniere (covering 8% of its US gas production currently, rising to almost 20% in mid-2025).

Schlumberger (SLB) is a leading oil services company with a focus on well construction, reservoir performance, and production. They've also got a strong digital program emerging which is expected to drive long-term growth. SLB has been passing on price increases well and their cash flow generation has remained steady which gives them a strong footing for capital return. SLB has been reaping the benefits of increased activity and has a strong international presence. SLB has a market cap of $71B and trades 16.5X Earnings and 10X EBITA with a 5%+ FCF yield. Management remains quite upbeat about the resilience and opportunity set in the coming upstream investment cycle. SLB has laid out key growth drivers in offshore markets and the Middle East. SLB sees >15% revenue growth and mid-20% EBITDA growth in 2023. SLB will likely return a healthy amount of capital to shareholders in 2023. SLB is positioned well for a more disciplined energy cycle and its technological leadership continues to drive industry-best metrics.

Booking (BKNG) remains in a trend of lower highs on the weekly and needs to clear the 2200 level, weekly MACD in bull mode. Booking is a leading travel company under brands Booking.com, Priceline, Agoda, Rentalcars.com, KAYAK, and OpenTable. The OTA group has been weak despite strong travel trends with concerns of competition from Google. BKNG's industry-leading margins, high-quality earnings, strong free cash flow and liquidity position and solid balance sheet have it well positioned to navigate any potential near-term economic uncertainty. BKNG saw the largest sequential net increase in alternative accommodation properties since 2019. BKNG's vision for the connected trip strives to make booking and experiencing travel easier, more personal and more enjoyable while delivering better value to customers and a way to provide marketing opportunities to our supplier partners. BKNG sees a major opportunity to further penetrate customer travel spend on its platform and continues to show market share gains. BKNG now has a $76B market cap and trades just 15.7X Earnings, 4.75X Sales and with a 5-6% FCF yield. BKNG is not seeing any signs of consumer trade down (in Europe or globally) and even saw the European business (meaning European travelers traveling) accelerate into October. BKNG continues to make progress diversifying and improving the mix of its large business. Capital returns and better than expected profitability can support a re-rating higher.

Mercado Libre (MELI) is the largest online commerce ecosystem in Latin America based on unique visitors and page views. MELI offers users an ecosystem of six integrated e-commerce and digital payments services: the Mercado Libre Marketplace, the Mercado Pago Fintech platform, the Mercado Envios logistics service, the Mercado Libre Ads solution, the Mercado Libre Classifieds service and the Mercado Shops online storefronts solution. MELI can further monetize its online marketplace as it adds product categories and offers new value-added services within 'eCommerce ecosystem' verticals such as advertising, digital storefronts, and logistics. In Fintech, momentum continued across payment volumes and newer initiatives. MELI has a $42B market cap and trades 60X Earnings and 26X FCF with revenue growth seen accelerating to 22% over the next two years with 35-40% annual EBITDA growth, a name that stands out in ecommerce for durable growth. MELI's Brazil gross merchandise value (GMV) outgrew the top 3 Brazil peers strongly in Q3. Management noted favorable elements to their product mix, with less exposure to the cyclical, high-ticket electronics category; further, MELI cited the marketplace model where consumers can trade down to lower-price items amid macro pressure.

Las Vegas Sands (LVS) is a leading developer of destination properties that feature premium accommodations, gaming, and entertainment. The Company owns and operates Integrated Resorts in Asia and the United States. LVS has a $37B market cap trading 43.7X Earnings and 15X projected FY23 EBITDA with revenues seen rising 91% in 2023 with 200% EPS growth. LVS is the preferred play for the Macau bottoming theme with its strong positioning. Reopening and easier travel are key themes of 2023, resulting in normalized earnings in 2024. A resilient travel market supports strength in the US markets as well. LVS also has a strong balance sheet to capitalize on new development opportunities. LVS sets up as a positive estimate revision play in 2023 as long as Macau remains open.

AutoZone (AZO) is the leading retailer and distributor of automotive replacement parts and accessories in the Americas. The industry has performed strong during recessionary periods as consumers extend the lives of vehicles and miles-driven are also growing in the US. AZO is taking market share and its positioning in DIFM should allow it to continue to post strong numbers while share count continues to shrink with consistent buybacks. AZO's DIFM segment grew +22% y/y in F'Q4 and has grown ~30% on average over the last six quarters. DIY growth was positive in F'Q4 (~2%), refuting concerns about DIY turning negative due to tough compares and weaker low-end consumer health. AZO is best positioned through any recession given its leading exposure to the more defensive DIY segment (~75% of sales). AZO with a $44B market cap remains cheap at 16.5X Earnings, 11X EBITDA and 2.7X Sales with forecasts for revenues to grow 5-6% annually and double-digit EPS growth.

Philip Morris (PM) is a leading tobacco company but continues to see significant upside into the next decade as they transition more smokers into the higher-margin, less harmful alternatives given IQOS which has about 2.5X revenue per stick. The company sees a long runway for growth in low- and middle-income markets where adoption is in the early stages while Japan and Europe's biggest cities continue to be strong. PM has been active in 2022 with the Swedish Match deal and the Juul US marketing arrangement. PM has a $157B market cap and trades 17.9X Earnings, 4.95X Sales and 13X EBITDA with EBITDA growth seen at 2.6% in 2023 and ramping to double digits for 2024/2025. PM's impending entry into the US offers an attractive growth opportunity as the US is one of the world's largest tobacco profit pools (~$20 billion in 2021), with ~31 million smokers. The IQOS launch catalyst a couple years off likely supports shares through 2023/2024 while pricing power keeps the core business generating solid FCF.

JM Smucker (SJM) segments include U.S. Retail Pet Foods, U.S. Retail Coffee, and U.S. Retail Consumer Foods. The Company's products include coffee, cat food, pet snacks, dog food, peanut butter, frozen handheld products, fruit spreads, portion control products, juices and beverages, as well as baking mixes and ingredients. SJM has positioned in 3 of the most attractive and resilient categories in the food space. Snacking is now a $150 billion market in the U.S., and it is projected to continue to grow. Diving deeper into frozen snacking and sandwiches, a key focus area for us, the category is expected to reach $9 billion by 2026, reflecting growth of nearly 20% from today. SJM has a market cap of $16.4B and trades 16X Earnings, 2X Sales and 13X EBITDA with revenues seen growing 5.7% in 2023 and EBITDA at 9% growth. SJM is implementing a comprehensive marketing, innovation, & retail strategy and increasing its productivity efforts. The company sees multiple avenues for growth in its Uncrustables business and expects it to make up 50% of the Consumer Foods business within the next five years, contributing to margin expansion, and accounting for over 1% total company top-line growth. SJM sees coffee as a growth driver as consumption is at a two decade high in the U.S. and given the continued shift to "at home" coffee, with 17M new at home brewers purchased in the last three years and 70% of all coffee occasions occurring at home.

Monster (MNST) is one of the best performing stocks over the past few decades that annually screens as a top name due to its outsized growth in an industry lacking much growth. MNST is a leader in the alternative beverage category with energy drink beverages and concentrates for energy drink beverages under key brands like Monster, Reign, NOS, and Full Throttle. According to Beverage Marketing Corporation the alternative beverage category in the US is a $60.5B market. MNST has always made the annual top stocks list as one of the few quality growth stories in the consumer staples sector as consumer habits continue to favor Energy drinks as a top growth category. Convenience Stores is a key channel for sales (68%) and with miles driven / mobility rising with the reopening MNST should stand to benefit. MNST also continues to innovate products (including the recent 12oz cans) and is growing its presence in China. MNST has a $52B market cap and trades 33.5X Earnings, 23X EBITDA and 8.35X sales, rich on valuation with revenues seen growing 10-12% annually and EPS seen jumping 30% in 2023. MNST is regaining market share and its alcohol product launch in 2023 should be a key growth driver while it also is launching an unflavored water product and continues to innovate. MNST should see a strong recovery in margins in 2023 on lower commodity costs and higher pricing. The combination of new products, margin gains, share gains and continued operational excellence keeps it as a top pick.

Capri (CPRI) is a designer, marketer, distributor and retailer of branded women's and men's accessories, footwear and ready-to-wear, as well as wearable technology, watches, jewelry, eyewear and fragrance products. The Company's segments include Versace, Jimmy Choo and Michael Kors. The $7.5B company remains cheap at 8X Earnings, 7X EBITDA and 42X FCF with revenues seen accelerating in 1H24. CPRI management indicated limited signs of weakness in both NA & Europe on its November earnings call but has remained negative on China, which is a potential source of upside in 2023. Management’s long-term targets for Versace, Jimmy Choo & Michael Kors revenue of $2B, $1B & $5B & EBIT margins of ~20%, 15% & 25%, respectively. CPRI expressed openness to M&A during its most recent investor day, but a clear preference for share buybacks as a use of cash. CPRI announced a $1B buyback in November. CPRI has strong brand momentum and its higher-end brands should hold up better in 2023 while continuing to be a top operator with shareholder friendly capital returns.

Apollo Global (APO) is a leading global alternative investment manager on behalf of some of the world’s most prominent pension, endowment and sovereign wealth funds, as well as other institutional and individual investors. APO operates across Credit, Private Equity and Real Asset markets. AUM/Fee growth and fundraising are critical indicators in this industry. APO's investment style and discipline, and attractive end-markets set the company up for growth during a period that may otherwise prove challenging for money managers. APO hosted an Investor Day last year outlining mid- to high-teens FRE and EPS CAGR through 2026 with over $11/share EPS seen for 2026. APO has now integrated its key Athene merger and is in growth mode and also increasingly seen as a capital return story. APO has a $36.5B market cap and trades 9.2X Earnings and 2.9X Book with a 10.8% FCF yield. APO retail initiatives gaining traction with triple-A product on three platforms and likely getting on more platforms next year. The interest rate environment benefitting the retirement services business with better spreads and stronger flows into annuities products with management leaning into more organic opportunities, than inorganic in the current environment.

ICICI Bank (IBN) has a $77B market cap as a leading Bank in India trading 17X Earnings and 3.2X Book with a ROE of 16%. IBN earnings are seen growing 8.5% in 2023 and 18% in 2024 and overall offers the kind of growth that can not be found in US banks while India remains one of the stronger emerging growth economies in the World. IBN is coming off an excellent quarter with strong profit and loan growth. IBN continues to enhance its digital offerings and platforms to onboard new customers in a seamless manner and provide them end-to-end digital journeys and personalized solutions. IBN sees a long runway for growth as India continues to emerge from the pandemic.

Schwab (SCHW) is a savings and loan holding company engaged in wealth management, securities brokerage, banking, asset management, custody, and financial advisory services. Schwab provides financial services to individuals and institutional clients through two segments – Investor Services and Advisor Services and acquired TD Ameritrade in 2020. SCHW's acquisitions are increasing its scale and efficiency and it is also benefiting from the structural shift to low cost and DIY investing while higher rates are boosting NIM. SCHW has a $143B market cap and trades 16X Earnings and 20X FCF with revenues seen rising another 12% in 2023 and 23.7% EPS growth. SCHW business updates and metrics continue to come in extremely strong and a healthier equity backdrop in 2023 could provide an additional boost.

MasterCard (MA) is a global payments leader that connects consumers, financial institutions, merchants, governments, digital partners, businesses and other organizations worldwide, enabling them to use electronic forms of payment instead of cash and checks. MA continues to see strong spending trends despite a weaker consumer backdrop and also sees a massive opportunity in B2B while continuing to also invest in payment technology for the future. MA has a market cap of $330B and trades 28.5X Earnings, 37X FCF and revenues see rising 13% in 2023 and 15% in 2024 with even stronger EPS growth. The cross-border travel recovery continues to progress well as a source of growth. Cards are increasingly used for everyday, nondiscretionary purchases, as evidenced by the growth of tap to pay transactions, which we think is taking share in everyday categories like food & drug and commuter rail and now represent 54% of total face to face transactions. Persistent inflation can keep providing a benefit as ⅔ of revenue is volume based. Mastercard Send, B2B payments, and open banking are key initiatives to continue diversifying its business.

Raytheon (RTX) is an aerospace and defense company that provides advanced systems and services for commercial, military and government customers worldwide. Collins Aerospace Systems, Pratt & Whitney, Raytheon Intelligence & Space and Raytheon Missiles & Defense are its four operating segments. RTX stands to benefit from both the recovering Aerospace cycle and the strength in Defense spending. RTX with a market cap of $146B trades 19.2X Earnings, 15X EBITDA and yields a 2.24% dividend with revenues seen rising 8% in 2023/2024 after 4.3% growth in 2022 and EBITDA seen rising 9-12% annually after falling 3.5% in 2022. RTX sees exiting 2023 at or above 2019 levels for commercial aero led by the narrowbody recovery. RTX has seen a 1.15 book-to-bill on a 9-month basis in the defense businesses this year. Whether it's a layered defense, cyber space, the F-35 platform RTX is pretty well-aligned with everything that the United States and its allies are going to be prioritizing over the next 3 to 5 years. RTX recently announced a new $6B buyback. RTX provides us with exposure to Aerospace recovering as well as the upside trends in defense spending for a rising geopolitical tension backdrop.

Booz Allen (BAH) offers several services such as Analytics, Engineering, and Digital Solutions. The Defense industry is 47% of its customer base, Civil is 26% and Intelligence is 23%. BAH has been driving industry-leading growth and expanding margins with positive mix shift. BAH has a market cap of $13.78B and trades 21.1X Earnings, 1.55X Sales and yields 1.66% with revenues seen rising 9.4% in 2023 with 6% EPS growth. BAH has been posting strong book-to-bill ratios and raising guidance. BAH trades at a premium to government services peers but continues to be the best operator. BAH did a key deal for EverWatch which will complement Booz Allen's mission knowledge and full-spectrum cyber operations, mission analytics, AI, and 5G offerings. BAH is planning on pursuing more partnerships as a key part of its strategy. BAH also remains active in seeking out M&A. BAH is in a defensive industry offering strong financials and a history of strong execution.

Endeavor (EDR) is a global sports and entertainment company with the UFC its most notable property. EDR operates across three segments: (i) Owned Sports Properties, (ii) Events, Experiences & Rights, and (iii) Representation. EDR operates more than 800 events annually around the globe, including live sports events covering more than 15 sports across more than 25 countries. EDR represents many of the world's greatest creators, performers, influencers, athletes, and models across entertainment, sports, and fashion. EDR has a market cap of $9.8B and trades 14.6X Earnings, 16X EBITDA and 21.6X FCF with revenues seen growing 10% in

2023 and 2024 and EPS growing 22.7% and 13%. Sports rights, talent monetization, and live events offers durable growth even in a tough macro. EDR is a highly contracted business model with strong cash flows benefitting from the rising value of content and experiences across sports and entertainment. Leverage has been a concern but strong FCF conversion will allow it to delever. EDR seems wildly cheap at current levels for a durable growth business with strong financials.

Parker Hannifin (PH) is a leading worldwide diversified manufacturer of motion and control technologies and systems, providing precision engineered solutions for a wide variety of mobile, industrial and aerospace markets. PH has a market cap of $37.2B and trades 13.8X Earnings, 12.5X EBITDA and 23.2X FCF with a 1.86% dividend yield. PH is seeing robust bookings across all of its industrial businesses with electrification and aerospace recovery two key tailwinds. PH has done a couple key large acquisitions with LORD and Meggitt the past few years and can now focus on operating and integration. A weakening PMI/Macro backdrop is always a concern for industrials, but PH looks more insulated than most peers.

SBA Communications (SBAC) is the top play for an expected recovery in tower stocks. SBAC is a leading independent owner and operator of wireless communications infrastructure, including tower structures, rooftops, and other structures that support antennas used for wireless communications. SBAC's top customers are T-Mobile, AT&T and Verizon at 34.5%, 24% and 14% of revenues respectively. SBAC is positioned to benefit from a strong capex spend environment from carriers due to investment in C-band. SBAC screens attractive to peers across all metrics justifying its premium multiple and increased carrier activity and 5G deployments set it up for continued strength. SBAC has a $31B market cap and trades 23X FFO with a 1% dividend yield. SBAC is seeing its strongest international new revenue. SBAC is down 28% in 2022 and looks to be an opportunity to buy a best-in-class name in a strong and defensive industry.

CoStar Group (CSGP) is the leading provider of commercial real estate information, analytics, and online marketplaces. CSGP has a strong moat as a dominant player in the industry and is working to expand further into residential in the years to come. CSGP has a $31.67B market cap trading rich at 53X Earnings, 85X FCF and 36X EBITDA with revenues seen rising 14-16% annually with 17-20% EPS growth, a top tier grower. CSGP can deliver robust sales and EBITDA growth even in a recession as real estate owners ramp marketing spend amid higher vacancies. CSGP has been investing heavily and should be able to see margins improve out of an investment year. The company is expanding in four verticals with a $20B TAM and residential offers a massive growth opportunity. CSGP has 92% subscription revenue with 5yr+ subscribers renewing at ~97% which provides strong revenue visibility. Price increases, improved penetration, new product launches, and International expansion are all upside drivers.

Constellation Energy (CEG) is America's leading clean energy company, based on the production of carbon-free electricity as the largest supplier of clean energy and sustainable solutions to homes, businesses, governments, community aggregations and a range of wholesale customers (such as municipalities, cooperatives, and other strategics) across the continental U.S., backed by approximately 32,400 megawatts of generating capacity consisting of nuclear, wind, solar, natural gas and hydroelectric assets. Nuclear accounts for the majority of its power generation followed by Natural Gas and Renewables. The Mid-Atlantic and Midwest account for 69% of generation. CEG has a market cap of $30.9B and trades 20.3X Earnings and 12.9X EBITDA with a 0.62% yield. Forecasts see EBITDA growth of 17.8% in 2023 and 9% growth in 2024, so a leading Utility growth name deserving a higher multiple. Nuclear M&A, hydrogen projects, nuclear plant uprates, and 2023 capital allocation are potential 2023 catalysts and the nuclear PTC provides longer-term inflation protection through escalation factors. Constellation Energy will be a strong cash flow producer, offering investors optionality on buybacks, accretive M&A, or special dividends.

New Fortress Energy (NFE) offers a rare growth profile among the Utility names. NFE is an integrated energy platform targeting the delivery of cost-efficient low carbon energy and power solutions to its customers through switching from higher emissions fuels (oil, coal) to cleaner alternatives (natural gas, hydrogen). NFE's primary business involves sourcing liquefied natural gas (LNG) and delivering it to its downstream terminals, power plants and industrial customers, largely located in the Caribbean and Central/South America. NFE is uniquely positioned to benefit from the energy transition as hydrogen can be integrated into much of their existing infrastructure with little to no modification required. The 2 hydrogen hubs (one green facility in Texas and one blue in Pennsylvania) are expected to deliver $150M in annual EBITDA. Beyond development of hydrogen plants and hydrogen-capable downstream terminals, NFE is focusing on financing and deploying "Fast LNG" (FLNG) — small, modular offshore LNG production facilities that can be brought online more quickly than larger-scale onshore solutions. NFE has a market cap of $9.4B and trades 7.8X Earnings, 8X FY23 EBITDA and EBITDA growth seen at 56.7% in 2023 and 85% in 2024 while FCF yield may hit 30% in 2024.

First Solar (FSLR) is a leading American solar technology company and global provider of PV solar energy solutions. FLSR makes PV solar modules with an advanced thin film semiconductor technology that provides a high-performance, lower-carbon alternative to conventional crystalline silicon PV solar modules. Solar energy is one of the fastest growing forms of renewable energy with numerous economic and environmental benefits that make it an attractive complement to and/or substitute for traditional forms of energy generation. FSLR will be a key beneficiary of the IRA and is expanding operations, reporting robust bookings, and seeing surging demand. FSLR has a $17B market cap trading 40X Earnings and 6.7X Sales with revenues seen jumping 25-35% each of the next two years along with more than 140% EBITDA growth each year. FSLR has traded higher despite some weak results due to cost pressures as the issues are transitory and the pipeline shows a massive surge in growth coming the next few years. The company added +16.6 GW to its bookings Q/Q, which is a significant improvement to the 10.4 GW added in 2Q and brings YTD bookings to 43.7 GW. FSLR ASPs look to be holding up with strong pricing power and relentless demand.

Motorola Solutions (MSI) is a global leader in public safety and enterprise security with technologies in Land Mobile Radio Communications, Video Security and Access Control and Command Center Software, bolstered by managed and support services. The Video Security and Access Control technology includes video management infrastructure, AI-powered security cameras including fixed and mobile (body-worn and in-vehicle) and access control solutions. Software was 38% of total sales in 2021. MSI has a $43B market cap and trades 22.5X Earnings and 5X EV/Sales with revenues seen rising 5-7% annually and EPS 10-12% growth. MSI demand indicators remain healthy with the company reporting growth across product segments. MSI is a more defensive Tech name for what is expected to be a tougher environment in 2023.

Broadcom (AVGO) develops and supplies a broad range of semiconductor and infrastructure software solutions. AVGO is involved with enterprise and data center networking, home connectivity, set-top boxes, broadband access, telecommunication equipment, smartphones and base stations, data center servers and storage systems, factory automation, power generation and alternative energy systems, and electronic displays. AVGO acquired Symantec's enterprise security business in 2019 and has been a serial acquirer including a recent deal for VMware as it continues to focus on software becoming a greater part of its mix. AVGO has a market cap of $235B and trades 12.85X Earnings, 7.1X Sales and 30.4X FCF with a 3.3% yield. AVGO forecasts see it entering a slower period of growth with 6% revenue growth an d8% EPS growth. AVGO continues to post results much better than industry peers and has 12 months of noncancellable backlog. The company noted particularly strong growth stemming from continued strong adoption of switching and routing silicon, as well as offload accelerators, which are both seeing strong demand from the hyperscale end market.

In what is a tough environment for Semiconductors in 2023 I think AVGO remains a stable own that also brings an increasing Software mix.

Workday (WDAY) provides approximately 9,500 organizations with software-as-a-service solutions to help solve business challenges, including supporting and empowering their workforce, managing their finances and spend in an ever-changing environment, and planning for the unexpected. WDAY has a $45.5B market cap and trades 38X Earnings, 29X FCF and 7X EV/Sales. Forecasts see WDAY revenues rising 17% in 2024/2025 after 19-20% annual growth the last three years while EPS seen surging 30% higher in 2024 and 25% in 2025. WDAY has 22% EBIT margins and 23.5% FCF margins, a quality software business. WDAY held an Analyst Day in September with management giving an argument for a rising focus on Talent and accelerating change in the enterprise fundamentally changing the priority of HCM and Financials, yielding higher durability of growth against a quickly growing TAM. WDAY is a $5.5 billion run rate subscription revenue business, with a 5-year average gross retention rate of 98%, targeting a $125 billion enterprise software TAM, sustaining 20%+ top-line growth with best in class unit economics. With 14 of the core 22 products at Workday having been released in the last 4 years, the upsell opportunity within the base remains nascent. Workday is looking to drive enterprise cloud transformation efforts by increasing its focus on industry growth through the launch of its Industry Accelerators Program.

PTC Inc (PTC) is a global software company that provides a portfolio of innovative digital solutions that work together to transform how physical products are engineered, manufactured, and serviced. Its software portfolio includes award-winning offerings in the computer-aided design (CAD) and product lifecycle management (PLM) markets. CAD is utilized for product data authoring and PLM is for product data management and process orchestration. PTC’s customer base includes some of the world's most innovative manufacturers in the aerospace and defense, automotive, electronics and high tech, industrial machinery and equipment, life sciences, retail and consumer products industries. PTC has a $14.5B market cap and trades 23X Earnings, 35X FCF and 8X EV/Sales with revenues seen rising just 1.2% in 2023 followed by 10.8% growth in 2024. PTC is a SaaS transition story and also recently announced a $1.46B deal for ServiceMax. PTC has a highly recurring revenue stream and will generate strong FCF even in a weaker Macro backdrop.

Top 25 Short Investment Ideas for 2023 – In looking for shorts we are looking across key metrics to identify names trading at undeserving valuation premiums and may face a downward earnings revision cycle. Each name also has a “better option” as a more preferred peer in case one prefers to pairs trade rather than just short. Lastly, I am including a higher-risk short group of rapid growth names that can still see further multiple contraction but move quickly.

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE	ENTRY 1/2	ENTRY 2/2	TARGET	STOP	BETTER OPTION
ASML	ASML Holding NV (ADR)	231.2B	31.37X	10.30X	20.26%	19.76%	33.55%	39.16%	$605.00	$685.00	$490.00	$710.00	**KLAC**
NOW	ServiceNow Inc	79.8B	34.20X	10.68X	21.99%	21.09%	26.22%	23.11%	$465.00	$520.00	$290.00	$565.00	**MSFT**
SQ	Block Inc	37.4B	40.05X	2.09X	15.02%	33.55%	6.52%	2.8%	$75.00	$90.00	$45.00	$115.00	**MA**
MOS	Mosaic Co	15.4B	2.79X	0.95X	(13.812%)	(24.547%)	28.21%	24.34%	$50.00	$54.00	$38.00	$61.00	**CTVA**
TYL	Tyler Technologies, Inc.	13.3B	28.00X	7.20X	7.7%	12.22%	24.9%	12.4%	$375.00	$395.00	$240.00	$425.00	**PTC**
NTAP	NetApp Inc.	13.0B	7.17X	1.89X	3.06%	10.28%	23.63%	62.58%	$63.00	$68.00	$48.00	$77.00	**ANET**
XOM	Exxon Mobil Corp	431.2B	4.32X	1.04X	(6.721%)	(14.014%)	18.85%	21.86%	$105.00	$111.00	$85.00	$120.00	**EOG**
KMX	CarMax, Inc	9.8B	23.35X	0.89X	(1.264%)	11.41%	2.41%	2.44%	$74.00	$85.00	$47.00	$95.00	**DRVN**
TREX	Trex Company Inc	4.8B	15.74X	4.44X	(3.194%)	45.09%	10.27%	8.19%	$50.00	$60.00	$35.00	$67.00	**OC**
ITW	Illinois Tool Works Inc.	66.6B	17.56X	4.64X	(0.564%)	8.13%	24.51%	26.9%	$220.00	$235.00	$190.00	$245.00	**AME**
ICE	Intercontinental Exchange Inc	56.3B	15.21X	9.93X	5.26%	5.94%	45.41%	5.11%	$101.00	$112.00	$80.00	$121.00	**CBOE**
KDP	Keurig Dr Pepper Inc	51.1B	15.24X	4.46X	5.31%	3.56%	26.15%	8.29%	$37.00	$40.00	$32.00	$42.00	**STZ**
EW	Edwards Lifesciences Corp	45.1B	22.69X	8.20X	7.79%	12.26%	34.68%	20.33%	$85.00	$93.00	$60.00	$100.00	**INSP**
IDXX	IDEXX Laboratories, Inc.	33.8B	34.69X	10.46X	7.14%	7.89%	29.09%	52.35%	$425.00	$475.00	$515.00	$280.00	**A**
VEEV	Veeva Systems Inc	26.2B	27.49X	10.81X	13.07%	15.52%	39.74%	20.89%	$199.00	$217.00	$140.00	$235.00	**HQY**
WBD	Warner Bros Discovery Inc	24.1B	8.07X	1.69X	2.41%	12.38%	(22.295%)	(5.635%)	$13.00	$16.00	$8.00	$18.50	**DIS**
MKC	McCormick & Company Inc	22.4B	23.32X	4.34X	2.32%	5.34%	14.95%	7.63%	$85.00	$93.00	$65.00	$98.00	**KHC**
JBHT	J B Hunt Transport Services Inc	18.5B	9.66X	1.31X	(0.24%)	7.94%	9.44%	19.79%	$180.00	$195.00	$145.00	$205.00	**UPS**
BBY	Best Buy Co Inc	17.6B	6.17X	0.38X	(1.133%)	4.86%	3.89%	18.54%	$84.00	$92.00	$60.00	$102.00	**TSCO**
ALGN	Align Technology, Inc.	15.5B	15.80X	3.83X	1.85%	11.27%	20.22%	10.53%	$225.00	$255.00	$150.00	$285.00	**DXCM**
EXPE	Expedia Group Inc	13.8B	6.82X	1.43X	9.17%	13.23%	25.39%	23.41%	$99.00	$115.00	$64.00	$128.00	**ABNB**
DPZ	Domino's Pizza Inc	12.6B	20.78X	3.83X	3.97%	7.55%	16.51%	49.75%	$365.00	$400.00	$295.00	$435.00	**CMG**
CHRW	CH Robinson Worldwide Inc	11.1B	9.11X	0.52X	(14.565%)	4.58%	4.78%	25.82%	$95.00	$105.00	$75.00	$112.00	**XPO**
ELS	Equity LifeStyle Properties Inc	12.1B	25.11X	10.79X	3.97%	7.78%	26.53%	7.44%	$66.00	$71.00	$50.00	$77.00	**MAA**
QRVO	Qorvo Inc	9.6B	11.24X	2.93X	2.45%	19.31%	29.16%	15.61%	$115.00	$130.00	$70.00	$140.00	**QCOM**

Higher Risk Attractive Shorts

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE
TTD	Trade Desk Inc	22.6B	32.65X	13.47X	20.05%	39.33%	37.95%	15.04%
NET	Cloudflare Inc	29.1B	219.23X	29.69X	35.24%	35.59%	5.84%	2.86%
MDB	Mongodb Inc	14.1B	278.30X	10.69X	25.36%	31.21%	5.92%	4.34%
ZM	Zoom Video Communications Inc	20.4B	9.57X	3.49X	5.41%	0.77%	34.57%	22.2%
CHWY	Chewy Inc	18.0B	72.71X	1.72X	11.15%	42.69%	(0.017%)	(0.267%)
RBLX	Roblox Corp	16.6B	54.14X	5.14X	14.02%	36.11%	(57.949%)	(44.04%)
SNAP	Snap Inc	13.7B	36.88X	2.81X	8.82%	53.81%	5.08%	3.16%
U	Unity Software Inc	11.7B	-345.92X	8.52X	61.44%	73.37%	(11.594%)	(3.768%)
WOLF	Wolfspeed Inc	9.6B	93.28X	9.70X	45.14%	167.46%	(3.481%)	(0.966%)
TWLO	Twilio Inc	8.8B	24.34X	1.49X	16.53%	52.87%	(3.57%)	(1.187%)
DKNG	DraftKings Inc	5.4B	-5.83X	2.17X	34.37%		(90.654%)	(59.708%)

Top 35 Small Cap ($2B to $8B) Longs for 2023

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE	ENTRY 1/2	ENTRY 2/2	TARGET	STOP
OLN	Olin Corporation	7.0B	3.89X	1.00X	(9.054%)	31.88%	16.72%	19.82%	$50.00	$45.00	$80.00	$39.00
ASH	Ashland Inc	5.8B	10.20X	2.53X	4.22%	11.25%	13.77%	6.04%	$105.00	$97.00	$130.00	$85.00
MP	Mp Materials Corp	5.1B	11.88X	8.72X	(0.903%)	20.95%	71.4%	12.87%	$28.00	$25.00	$48.00	$20.00
BOWL	Bowlero Corp	2.1B	9.98X	3.34X	7.12%	12.56%	13.58%	7.26%	$12.00	$11.00	$17.00	$9.50
IRDM	Iridium Communications Inc	6.3B	18.32X	10.91X	6.87%	12.93%	9.71%	54.19%	$48.00	$45.00	$60.00	$42.00
TXRH	Texas Roadhouse Inc	6.5B	13.51X	1.58X	10.18%	13.72%	7.57%	14.02%	$93.00	$89.00	$125.00	$75.00
FOXF	Fox Factory Holding Corp	4.1B	13.26X	2.69X	5.67%	20.26%	17.81%	16.14%	$95.00	$85.00	$150.00	$70.00
BFAM	Bright Horizons Family Solutions Inc	3.6B	14.84X	2.34X	10.48%	17.06%	8.47%	4.1%	$62.00	$53.00	$100.00	$47.00
LNW	Light & Wonder Inc	5.9B	9.68X	3.50X	6.38%	10.15%	13.73%	5.56%	$56.00	$50.00	$105.00	$44.00
SMPL	Simply Good Foods Co	3.8B	16.90X	3.33X	6.65%	8.89%	18.76%	8.32%	$35.00	$30.00	$50.00	$27.00
IPAR	Inter Parfums, Inc.	2.9B	16.66X	2.97X	8.48%	16.91%	22.99%	23.89%	$85.00	$80.00	$125.00	$73.00
INGR	Ingredion Inc	6.4B	8.62X	1.09X	6.17%	10.88%	9.44%	9.41%	$91.00	$97.00	$120.00	$84.00
VVV	Valvoline Inc	5.3B	18.90X	5.00X	12.89%	18.56%	(10.888%)	18.77%	$30.00	$28.00	$44.00	$25.00
NFG	National Fuel Gas Co.	5.7B	5.95X	3.39X	4.61%	4.67%	40.86%	13.55%	$62.00	$59.00	$80.00	$56.00
STEP	Stepstone Group Inc	2.9B	15.67X	5.88X	10.55%	20.5%	24.01%	(3.616%)	$26.00	$23.00	$38.00	$19.00
FCFS	Firstcash Holdings Inc	4.1B	9.48X	1.49X	9.32%	13.9%	12.33%	7.48%	$85.00	$79.00	$120.00	$70.00
ACT	Enact Holdings Inc	3.9B		3.56X	3.11%		95.69%	14.32%	$24.00	$22.00	$33.00	$20.00
BRP	BRP Group Inc	3.1B	25.05X	4.99X	20.34%	27.14%	0.66%	0.24%	$26.00	$22.00	$40.00	$16.50
AZTA	Azenta Inc	4.4B	36.61X	3.49X	12.33%	41.28%	1.5%	0.37%	$55.00	$48.00	$80.00	$38.00
ACHC	Acadia Healthcare Company Inc	7.7B	15.15X	3.51X	8.95%	11.12%	18.89%	8.44%	$80.00	$74.00	$110.00	$69.00
GMED	Globus Medical Inc	7.2B	17.96X	6.09X	9.26%	9.86%	24.94%	10.87%	$67.00	$63.00	$90.00	$56.00
DOCS	Doximity Inc	6.8B	32.82X	14.06X	22.49%	25.43%	43.66%	15.45%	$33.50	$30.00	$50.00	$24.00
HALO	Halozyme Therapeutics, Inc.	7.7B	27.09X	13.21X	31.48%	48.47%	40.05%	16.78%	$54.00	$49.00	$70.00	$44.50
CWST	Casella Waste Systems Inc.	4.2B	19.34X	4.43X	7.47%	12.6%	12.91%	8.89%	$78.00	$75.00	$100.00	$67.00
ATKR	Atkore Inc	4.7B	5.52X	1.36X	3.47%	1.06%	30.18%	46.98%	$110.00	$100.00	$145.00	$84.00
MTZ	MasTec Inc	6.7B	11.39X	0.91X	33.53%	16.49%	7.08%	10.57%	$82.00	$74.00	$110.00	$64.00
HXL	Hexcel Corporation	4.8B	18.92X	3.54X	12.9%	14.9%	11.3%	5.14%	$57.00	$51.00	$80.00	$46.00
EGP	Eastgroup Properties Inc	6.4B	24.33X	16.75X	11.81%	8.9%	40.28%	5.18%	$145.00	$136.00	$184.00	$128.00
KRG	Kite Realty Group Trust	4.6B	14.51X	9.66X	3.81%	3.85%	9.14%	0.99%	$20.00	$19.00	$28.00	$16.50
ORA	Ormat Technologies, Inc.	4.8B	15.07X	8.98X	18.64%	10.43%	22.51%	2.8%	$83.00	$79.00	$110.00	$72.00
CWT	California Water Service Group	3.3B	16.73X	5.21X	4.96%	5.89%	24.39%	7.5%	$60.00	$56.00	$75.00	$52.00
SHLS	Shoals Technologies Group Inc	4.9B	60.70X	16.17X	59.72%	48.15%	28.73%	19.44%	$24.00	$20.00	$40.00	$16.00
EXTR	Extreme Networks, Inc	2.4B	12.63X	2.01X	12.82%	30.05%	12.15%	22.61%	$18.50	$16.00	$24.00	$14.00
ACLS	Axcelis Technologies Inc	2.7B	11.78X	2.69X	5.56%		23.21%	28.07%	$75.00	$65.00	$110.00	$55.00
GLOB	Globant SA	7.0B	19.45X	3.81X	22.32%	28.38%	16.05%	14.75%	$165.00	$150.00	$225.00	$130.00

Olin (OLN) operates in three segments: Chlor Alkali Products and Vinyls, Epoxy and Winchester. The Chlor Alkali Products and Vinyls segment manufactures and sells chlorine and caustic soda, ethylene dichloride and vinyl chloride monomer, methyl chloride, methylene chloride, chloroform, carbon tetrachloride, perchloroethylene, hydrochloric acid, hydrogen, bleach products and potassium hydroxide, which represent 46% of 2021 sales. The Epoxy segment produces and sells a full range of epoxy materials and precursors, including aromatics (acetone, bisphenol, cumene and phenol), allyl chloride, epichlorohydrin, liquid epoxy resins, solid epoxy resins and downstream products such as converted epoxy resins and additives, which represent 36% of 2021 sales. The Winchester segment produces and sells sporting ammunition, reloading components, small caliber military ammunition and components, and industrial cartridges, which represent 18% of 2021 sales. Olin repurchased ~5% of outstanding shares in 2Q22 and announced a new share repurchase program that raises its total authorization to ~$2,363M (~31% of its current market cap). OLN has a $7B market cap and trades 8.2X Earnings, 5X FY23 EBITDA and a 17% FCF yield. OLN stands out as a name that can withstand a global slowdown better than peers.

Ashland (ASH) is a global specialty additives and materials company in a wide range of consumer and industrial markets including, architectural coatings, construction, energy, food and beverage, nutraceuticals, personal care and pharmaceutical. Ashland's reportable segments include: Life Sciences; Personal Care (formerly Personal Care and Household); Specialty Additives; and Intermediates (formerly Intermediates and Solvents). ASH has a market cap of $5.74B and trades 10X EBITDA and 15X Earnings with a 7% FCF yield, screening favorable to chemical peers and looks to be a better defensive play with its end-market exposures. ASH should continue to reap benefits of its realigned portfolio and is positioned for a period of margin expansion as costs come down.

MP Materials (MP) owns and operates the mountain pass rare earth mine and processing facility in California in North America's rare earth production site. Processing Facility (Mountain Pass), which is a rare earth mining and processing site of scale in the western hemisphere. The Company is focused on producing neodymium-praseodymium (NdPr), lanthanum, and cerium oxides and carbonates. Back in June MP was at the JPM Energy conference and stated, we are building a U.S. rare earth supply chain to support the growth that's required in rare earth permanent magnets to drive this electrification in the electric vehicle space, wind turbine space and really, anything that requires industrial motion often has a magnet. MP screens cheap with a $5B market cap trading 21X Earnings and 12X FY23 EBITDA with EBITDA growth seen at 33.6% in 2024 after dipping in 2023. MP has been hitting major milestones and beating estimates. MP is a solid derivative play on the electrification theme and has long as stage two and three expansions go as planned, offers a compelling value at these levels.

Bowlero (BOWL) is an American bowling center operator. It is the largest ten-pin bowling center operator in the world with around 300 centers, almost all of which are located in the United States. BOWL is a small name that keeps posting very strong results while also expanding via acquisitions in a very fragmented market. BOWL operates traditional bowling centers and more upscale entertainment concepts with lounge seating, arcades, enhanced food and beverage offerings, and more robust customer service for individuals and group events, as well as hosting and overseeing professional and non-professional bowling tournaments and related broadcasting. BOWL has a $2B market cap and trades 18X Earnings, 10X EBITDA and 2.1X Sales with a 4.9% FCF yield and forecasts for 13% topline growth and 9% EBITDA growth in 2023. BOWL has strong post-pandemic tailwinds and operates at 34% EBITDA margins, an attractive business model with a long runway for steady growth.

Iridium (IRDM) is engaged in providing mobile voice and data communications services using a constellation of orbiting satellites. It provides voice and data communications to business, the US and foreign governments, and consumers via its upgraded satellite network. IRDM is the only commercial provider of communications services offering true global coverage, connecting people, organizations and assets to and from anywhere, in real time. Its unique L-band satellite network provides reliable communications services to regions of the world where terrestrial wireless or wireline networks do not exist or are limited, including remote land areas, open ocean, airways, the polar regions, and regions where the telecommunications infrastructure has been affected by political conflicts or natural disasters. The U.S. government has been IRDM's largest customer. IRDM shares are +20% YTD after being a top pick for 2022 and the $6.25B company now trades 17X FY23 forecasted EBITDA with solid 6-8% topline growth seen ahead and 7-12% EBITDA growth. Samsung is reportedly working with Iridium to bring satellite connectivity to the Galaxy S23 smartphone family. IRDM is uniquely positioned to benefit from eventual smartphone satellite connectivity.

Texas Roadhouse (TXRH) operates casual dining restaurants in the US under the Texas Roadhouse, Bubba's 33, and Jaggers names. The company is navigating labor issues and the inflationary environment as they continue to see strong demand despite consumer concerns around spending. TXRH has done well expanding its off-premise dining offerings. TXRH's "Butcher Shop" concept business could prove to be a major future growth driver. TXRH still has a meaningful opportunity to expand store count across its brands. TXRH also stands to benefit from beef prices moving lower. The $6.5B company has been a top casual dining operator and trades 20X Earnings, 1.67X Sales and 41X FCF with double-digit revenue growth seen in 2023 and consistent 12-15% EBITDA growth. TXRH will accelerate new openings in 2023 and has utilized price raises to offset inflation pressures.

Fox Factory (FOXF) key end markets of mountain bikes, off-road vehicles, and powersports faced tough comps in 2022 but the name annually screens as a top operator and has come down to more attractive levels. FOXF is a designer, manufacturer and marketer of performance-defining products and systems used primarily on bikes, side-by-sides, on-road vehicles with and without off-road capabilities, off-road vehicles and trucks, ATVs, snowmobiles, specialty vehicles and applications, motorcycles, and commercial trucks. FOXF focused on premium-priced products within each of these categories. FOXF has a $4B market cap and trades 16.2X Earnings, 12X FY23 EBITDA and sees revenue growth of 5.7% in 2023 with 8% EBITDA growth. FOXF has strong visibility into 2023 driven by auto and up-fitting backlog and should see margins bounce back in 2023 as supply chain and cost pressure issues abate.

Bright Family (BFAM) is one of the few ways to gain exposure to the rising cost and need of child care and early education. BFAM has a significant scale and expanding International presence with 705 centers in the US and seeing capacity for 88,900. Demographic trends like full time working women and two parent households as dual career earners support its business. It is also seeing strong growth from adjacent services. It sees sustainable 8-10% organic growth with a balance of new centers, tuition increases, enrollment increases and adjacent services contributing. BFAM has also outlined the big opportunity in backup care. BFAM was obviously hit hard by the pandemic and continues to face labor challenges but the $3.7B company now at 12.8X EBITDA with a 5.6% FCF yield screens attractive. BFAM revenues are seen rising 10.5% in 2023 off a 15.9% jump in 2022 and seen delivering 15%+ EBITDA growth. BFAM sets up for margin expansion the next few years and the toughest parts of its operating environment look to be in the rear-view mirror. Labor shortages driving lower enrollments and higher wages pressuring margins has been the overhang. BFAM should get back on track to pre-pandemic occupancy in 2023.

Light & Wonder (LNW) is the former Scientific Games that has restructured the portfolio as a leading developer of technology-based products and services and associated content for the worldwide gaming, lottery, social and digital gaming industries. It sold its Sports Betting business to Endeavor Group for $1B cash and 7.6M shares of EDR. It sold its Lottery business to Brookfield Business Partners for $5.825 billion in cash and an earn-out of up to $225 million. Gaming, SciPlay and iGaming are its focus segments moving forward. The gaming industry is characterized by the continuous development of new technologies, products and game content. LNW has a $5.6B market cap and trades 8.5X FY23 EBITDA with revenues seen rising 6% annually the next two years with 9-11% annual EBITDA growth. LNW could face a slowdown in the replacement cycle and increased competition but remains a compelling turnaround story under a new CEO with a strong vision to transform the business.

Simply Good Foods (SMPL) is a consumer-packaged food and beverage company that aims to lead the nutritious snacking movement with a product portfolio that primarily consists of protein bars, ready-to-drink ("RTD") shakes, sweet and salty snacks and confectionery products marketed under the Atkins®, Atkins Endulge®, Quest® and Quest HeroTM brand names. SMPL has a $3.77B market cap and trades 20.85X Earnings, 35.7X FCF and 16.8X EBITDA while delivering strong quarterly numbers as a key play on the strongest consumer trends, nutrition and snacking. SMPL revenues are seen growing 5-7% annually with 10-12% EPS growth. SMPL distribution growth is seen higher as it gains shelf-space at Walmart and other retailers. SMPL's management team is cautious on the consumer and the impact from recent prices increases but thus far has continued to deliver excellent numbers with little private label competition in its categories, and strong presence in mass channels that benefit when consumers seek value during recessions.

Inter Parfums (IPAR) operates in the fragrance business and manufacture, market and distribute a wide array of fragrance and fragrance related products. Its business is not capital intensive, having no manufacturing facilities. It skey brands include Montblanc, Jimmy Choo, Coach and Guess. IPAR has a $3B market cap and trades 25X Earnings, 3X Sales and 15X FY23 EBITDA with revenues seen rising 8-10% annually after jumping 16% in 2022 and seen delivering double-digit EBITDA growth. IPAR continues to execute well and the fragrance industry shows resilience in economic downturns while it is also launching new products and brand extensions. IPAR is seen benefitting from operating efficiencies and market share gains in a fast-growing fragrance industry with its vast portfolio of license agreements.

Ingredion (INGR) produces and sells starches and sweeteners for use in food/beverage, pharmaceutical, personal care, and other markets. INGR has long-term tailwinds from plant-based proteins and sugar reduction trends in the US, rapidly growing categories where they have made significant investments. The sugar reduction market is estimated to be $5B by 2026. INGR has a $6.4B market cap and trades cheap at 12X Earnings and 8X EBITDA with revenues seen rising another 6% in 2023 with 7% EBITDA growth. Ingredion is well positioned to benefit from growing global mega-trends such as plant-based meat diets or the reduction of sugar. With a growing share of specialty product sales, the company should also see higher and more stable margins in the future. INGR is also buying back stock and its strategy appears to be working in transitioning the portfolio to higher growth, higher margin specialties which can allow for shares to re-rate higher.

Valvoline (VVV) is a global vehicle and engine care company that continuously powers the future of mobility through innovative services and products for electric, hybrid, and internal combustion powertrains. Demand for preventive automotive maintenance in both the automotive aftermarket services and the finished lubricants markets benefits from ongoing improvements in miles driven and the growing number and age of vehicles in operation, in addition to increasing vehicle complexity. VVV sold its Global Products segment for $2.65B in August and is now focused on Retail Services. VVV has a market cap of $5B and trades 16X Earnings, 1.4X Sales, 12X FY23 EBITDA and yields 1.73%. VVV’s new growth focused business should allow for multiple expansion as a pure play auto services business focused on Quick Lubes (oil changes). The cash from the segment sale can be used for buybacks and debt reduction. Relative to DRVN/MCW, VVV screens as higher growth with a higher franchised mix and less technical overhangs.

National Fuel & Gas (NFG) is a diversified energy company engaged principally in the production, gathering, transportation, storage and distribution of natural gas now positioned as a pure-play Appalachia name. Current natural gas production development activities are focused in the Marcellus and Utica shales, geological shale formations that are present nearly a mile or more below the surface in the Appalachian region of the United States. NFG fits a desire for lower Beta energy names into a tougher 2023 backdrop and the $5.8B company trades 8.35X Earnings, 3.4X EBITDA and yields a 3% dividend. NFG recently reduced its outlook due to lower natural gas prices and the company has been using costless collars to hedge and participate in upside moves. NFG is accelerating production with 17 new wells coming online during the first quarter.

Step Stone (STEP) is a global private markets investment firm focused on providing customized investment solutions and advisory and data services to clients. STEP’s total AUM and AUA since 2007 has grown at a 59% CAGR. STEP’s multi-asset expertise, proprietary technology and focus on customizations has set itself apart from peers and it continues to ramp its platform numbers and build out the business. STEP also made a key strategic acquisition of Greenspring which expanded its presence in growth equity and VC investing. STEP earns management fee revenues on invested capital, as opposed to NAV, resulting in greater consistency and predictability of revenues. StepStone is an attractive play on structural growth in private markets, with sticky fee revenue, access to fast-growing end markets & an ability to expand margins with its capital-light model. STEP is solid long-term earnings growth name with a growing presence in key markets. STEP made this list last year and down 37% YTD but the opportunity has not changes and now with a $2.9B market cap at 16.8X Earnings screens very attractive to peers. STEP recently started a new dividend policy that could attract a larger set of investors. STEP growth should continue with international expansion where allocations are increasing to alternative investments.

First Cash (FCFS) is the leading operator of pawn stores in the U.S. and Latin America and is a leading provider of technology-driven, retail point-of-sale payment solutions focused on serving credit-constrained consumers. With the AFF Acquisition, the Company now operates two business lines: pawn operations and retail POS payment solutions. The pawn industry in the U.S. is well established, with the highest concentration of pawn stores located in the Southeast, Midwest and Southwest regions of the country. The items sold generally consist of pre-owned consumer products such as jewelry, electronics, tools, appliances, sporting goods and musical instruments. The Company also melts certain quantities of scrap jewelry and sells the gold, silver and diamonds in the commodity markets. The Company's stores make pawn loans, which are typically small, secured loans, to its customers in order to help them meet instant or short-term cash needs. The industry has historically performed well in a recessionary environment. FCFS has a market cap just under $4B and trades 14X Earnings, 7.3X EBITDA and 12.6X FCF with a 1.5% yield. Forecasts see 26.7% EBITDA growth in 2023. FCFS has been posting strong results with robust cash flows supporting its dividend and buybacks.

Enact (ACT) is a leading private mortgage insurance company serving the United States housing finance market since 1981. Its principal mortgage insurance customers are originators of residential mortgage loans who typically determine which mortgage insurer or insurers they will use for the placement of mortgage insurance written on loans they originate. ACT has a rigorous approach to writing new insurance risk based on decades of loan-level data and experience in the mortgage insurance industry. Private mortgage insurance plays a critical role in the United States residential mortgage market by facilitating secondary market sales, particularly for Low-Down Payment Loans. Today, mortgage insurance products are primarily geared towards GSE secondary market sales. The increase in penetration of private mortgage insurance in the mortgage market can be attributed to both the introduction of new GSE products designed to serve Low-Down Payment Loan borrowers and more competitive pricing by private mortgage insurers relative to the Federal Housing Administration. ACT has a market cap just under $4B trading 7.5X Earnings and 0.97X Book with a 17% ROE and clean balance sheet. While the rise in interest rates has dampened mortgage origination volumes, it has increased persistency, which has been a tailwind for our insurance in-force. On an insurance in-force basis, the weighted average FICO score in ACT's portfolio during the quarter was 743. The average loan-to-value ratio was 93%, and our layered risk was 1.4% of our risk in-force. Despite a tough mortgage environment ACT is a strong operator with strong financials.

BRP Group (BRP) is a relatively recent entrant in the US P&C insurance broker industry. The brokerage industry is highly competitive and fragmented, with the top 15 brokers contributing ~54% of the $76b of 2020 US revenues; the top two brokers (AON and MMC) contributed ~17% of revenues. Brokerage performance is highly aligned with the strength of the economy. The industry is highly acquisitive by nature due to the high fragmentation and strong cash flows. BRP has a high growth profile, fueled both by strong organic growth and a robust M&A strategy. BRP operates a Managing General Agent (MGA) that it calls the "MGA of the

Future." A managing general agent is a specialized broker that has underwriting authority, but takes on no underwriting risk of its own. The MGA of the Future is a platform to quote and bind policies in a significantly faster time than the larger incumbent brokers. This is paramount for a low-touch product such as renters' policies, where a younger cohort prefers ease of use. BRP has a market cap of $3.1B and trades 20.6X Earnings and 2.25X Book with revenues seen rising 18-20% each of the next two years after explosive growth the last few years while EBITDA seen growing 30% annually. BRP is one of the strongest small cap growth stories nobody knows about.

Azenta (AZTA) is a leading global provider of life sciences sample exploration and management solutions for the life sciences market. AZTA supports customers from research to clinical development with our sample management, automated storage, and genomic services expertise. With the advent of biologics and personalized medicine, biological samples have become critical assets to the success of drug and therapy pipelines, and the proper management and protection of these samples has gained increased importance. AZTA has a $4.46B market cap and trades 23X FY24 EBITDA and 60X Earnings but has a ton of cash and recently announced a massive, in relation to its market cap, $1.5B buyback while having zero debt. Management is also indicating a bottom in growth and margins. AZTA is positioned nicely in a strong growth industry and the buyback should be very supportive in the near future while the company looks to post stronger results.

Acadia (ACHC) acquires and develops behavioral healthcare facilities while providing high-quality services, expanding referral networks and marketing initiatives while meeting the increased demand for behavioral healthcare services. Its facilities and services can generally be classified into the following categories: acute inpatient psychiatric facilities; specialty treatment facilities; and residential treatment centers. ACHC operates in a highly fragmented industry. Acadia has a market cap of $7.6B after rising 37% in 2022 and trades 15X Earnings, 13.7X EBITDA and 3X Sales with the topline seen growing 8-10% annually and EPS growth of around 10% annually. ACHC held an Investor Day in December where it outlined accelerated development plans and showed sustainable earnings growth via its investments and acquisitions. ACHC operates in a $110B market opportunity and with the UK divesture has delivered to 2.1X from 5X with ample dry powder while expecting to double revenues by 2028.

Globus (GMED) annually screens as the top small cap med-tech in orthopedics and has been a great name to own for many years. GMED is a medical device company that develops and commercializes healthcare solutions whose mission is to improve the quality of life of patients with musculoskeletal disorders. Its Musculoskeletal Solutions consist primarily of implantable devices, biologics, accessories, and unique surgical instruments used in an expansive range of spinal, orthopedic and neurosurgical procedures. Its Enabling Technologies are comprised of imaging, navigation and robotics solutions for assisted surgery which are advanced computer-assisted intelligent systems designed to enhance a surgeon's capabilities, and ultimately improve patient care and reduce radiation exposure for all involved, by streamlining surgical procedures to be safer, less invasive, and more accurate. GMED has a market cap of $7.25B and trades 30.8X Earnings, 7.25X Sales and 16X EBITDA with revenues seen rising 9-10% annually with 12-15% EPS growth. GMED is set for margin expansion in 2023 and continues to invest in trauma and enabling technology (AR plus recon) while remaining in a strong product pipeline cycle. Management noted that the recon robot launch is trending towards 2H23.

Doximity (DOCS) has a cloud-based platform that provides tools to its members, which help them to collaborate with colleagues, coordinate patient care, conduct virtual patient visits, stay up to date with medical news and research, and manage careers. The Company supports physicians in the practice of medicine with mobile and clinical workflow tools, such as voice and video telehealth, secure messaging, and digital faxing. DOCS has a market cap of $6.8B trading 44X Earnings, 43.6X FCF and 14X EV/Sales with revenues seen rising 20-25% annually and EBITDA also over 20% annual growth, a combination of profitability and strong topline growth. A key question is Doximity's ability to sustain momentum in its health systems business, which has been growing faster than the pharma business. Advertising companies are highlighting healthcare as an area of relative strength into a more difficult macro backdrop. DOCS is a bit rich but a strong multi-year story delivering against overly negative sentiment.

Halozyme (HALO) is a biopharma technology platform company with a proprietary enzyme, rHuPH20, that is used to facilitate the delivery of injected drugs and fluids. HALO licenses its technology to biopharmaceutical companies to collaboratively develop products and utilizes its ENHANZE® drug delivery technology. HALO has ENHANZE collaborations with Roche, Pfizer, Takeda, Janssen, AbbVie, Eli Lilly, Bristol Myers, Alexion, Horizon, and many others. HALO sees ENHANZE alone surpassing $1B in royalty revenues by 2031. HALO sees the potential to launch three new SC with ENHANZE products in the 2023-2025 timeframe driving further growth and has fifteen partner products under development while having five approved products to date. ENHANZE IP extends to 2023 in the EU and 2027 in the US protecting it from biosimilar competition. Janssen Darzalex has been a key recent driver, a product for patients with multiple myeloma where HALO created a subcutaneous version that's given in just 3 to 5 minutes underneath the skin as a result of the ENHANZE technology as opposed to a 4-6 hour IV. HALO has a market cap of $7.7B and trades 19.4X Earnings, 13X Sales and 16.5X EBITDA with revenues seen rising 31% in 2023 with 64% EBITDA growth. FY23 is likely to be a pivotal year for HALO, as progress with combining Enhanze with the autoinjector suite is likely to become a greater focus.

Casella Waste (CWST) is a regional, vertically integrated solid waste services company. CWST provides resource management expertise and services to residential, commercial, municipal and industrial customers, primarily in the areas of solid waste collection and disposal, transfer, recycling and organics services. CWST operates in six states: Vermont, New Hampshire, New York, Massachusetts, Maine and Pennsylvania. CWST owns and/or operates 46 solid waste collection operations, 58 transfer stations, 20 recycling facilities, eight Subtitle D landfills, four landfill gas-to-energy facilities and one landfill permitted to accept construction and demolition materials. CWST continues to see strong pricing as disposal capacity continues to tighten in the Northeast market as permanent site closures are reducing capacity and stronger economic and construction activity are driving higher volumes. CWST continues to advance several key efficiency areas, including route optimization, fleet standardization and automation, and maintenance programs to further reduce operating costs in the collection line-of-business. CWST is a $4B market cap and makes this list annually, now trading 17X EBITDA and 57X FCF with double-digit EBITDA growth seen continuing the next few years.

Atkore (ATKR) manufactures electrical raceway products and mechanical products and solutions (MP&S) such as conduits and fittings, armored cables, and metal framing. They have broad end-market exposure including new construction, renewable energy, data centers, and industrials. They are the leading brand in a number of their categories and given the short order cycles of many of their stock they face fewer challenges around supply gluts with customers. ATKR is benefitting from some mega-trends within the industrials including electrification of buildings to support net-zero energy transition goals. The company also helps with retrofitting buildings to meet new ESG standards. Elsewhere, their conduits are used across renewable energy cycle to build racking structures as well as transfer energy from the grid. ATKR should see strong long-term growth given the current regulatory pressures to update/refresh infrastructure. ATKR has a $4.5B market cap and trades 7.5X Earnings, 5.3X EBITDA and 7X FCF with 2022 currently forecasted as a peak year in its cycle with revenues seen down 5.6% in 2023 and EPS down 32%. However, ATKR remains positioned well for multi-year mega-trends and is likely to beat those estimates and valuation is too compelling to ignore for a strong grower.

MasTec (MTZ) is a leading infrastructure construction company with exposure to telecommunications, renewable energy, and pipelines. MTZ trades 16.6X Earnings, 2.5X Book and 7.7X FY23 EBITDA with revenues seen jumping 33.5% and EBITDA up 47%. MTZ is positioned well for infrastructure investment and has over $11B in backlog providing strong visibility. Management recently noted "When you layer on all of the other available dollars and you include the Infrastructure Act and the Inflation Reduction, we're talking $50 billion, $60 billion of additional federal dollars that are going to make it into broadband deployment." MTZ feels we are very early in the wireless cycle and expects further margin appreciation in 2023. MTZ also sees a massive opportunity in underground power distribution. MTZ's largest headwind has been labor pressure on the cost side so a recession could actually help relieve that pressure.

Hexcel (HXL) is a global leader in advanced lightweight composites technology. Its broad product range includes carbon fiber, specialty reinforcements, prepregs and other fiber-reinforced matrix materials, honeycomb, resins, engineered core and composite structures for use in commercial aerospace, space and defense, and industrial applications. HXL looks to be in a nice position for the commercial aerospace recovery that started in 2022. HXL has a market cap of $4.8B and trades 31.2X Earnings, 14.7X EBITDA and 3.3X Book with revenues seen rising 10-12% annually with EBITDA growth seen near 30% in 2023. HXL will benefit from the upcoming production ramp for Boeing and Airbus programs. International demand for fiber aircraft such as the F-35 and Rafael has strengthened along with defense budgets around the world. Potential future incremental wins for Hexcel may come in the form of FLRAA and FARA programs.

East Group (EGP) is focused on the development, acquisition and operation of industrial properties in major Sunbelt markets throughout the United States with an emphasis in the states of Florida, Texas, Arizona, California and North Carolina. Texas, Florida and California account for 76% of its net operating income. EGP has 45.7M square feet under ownership with a focus on multi-tenant including last mile e-commerce, shallow bay industrial and infill sites. EGP has a market cap of $6.5B and trades 20X FFO with a 3.43% yield. EGP screens well to peers and Industrial REITs remain a premium group while the PLD/DRE deal puts potential further consolidation as a possibility. EGP is seeing widespread rent growth. There are several, long-term positive secular trends occurring within last mile shallow bay distribution space and Sunbelt markets that will play out over years, such as population shifts, evolving logistics change, et cetera, which EGP is well positioned for.

Kite Realty (KRG) is a REIT that screened well engaged in the ownership, operation, acquisition, development and redevelopment of high-quality, open-air shopping centers and mixed-use assets in select markets in the United States. It derives revenues primarily from activities associated with the collection of contractual rents and reimbursement payments from tenants at our properties. KRG has interests in 180 operating retail properties totaling approximately 29.0 million square feet and one office property with 0.3 million square feet. No individual retail or office tenant accounted for more than 2.5% of the portfolio's ABR for the year ended December 31, 2021. Its largest tenants are TJX, BBY, ROST, Michaels, GPS, BBBY, DKS, Publix and PetSmart. KRG has a market cap of $4.67B and trades 11X FFO with a 4.6% yield. KRG is showing strength across metrics and has high SunBelt exposure while its merger with RPAI is just starting to pay benefits.

Ormat (ORA) is a leading vertically integrated company that is primarily engaged in the geothermal and recovered energy power businesses. ORA seeks to become a leading global provider of renewable energy. Electricity is 76.8% of revenues where ORA develops, builds, owns and operates geothermal, solar PV and recovered energy-based power plants. The Product segment is 21% of revenues, equipment for geothermal and recovered energy-based electricity generation and remote power units and provide services relating to the engineering, procurement and construction of geothermal and recovered energy-based power plants. ORA also has a small Energy Storage segment. Based on the IGA, as of January 2021, geothermal power is generated in 29 countries with a total installed power generation capacity of 15,600 MW at the end of 2020. The IGA estimates an additional 4,000 MW will be added by 2025. ORA is the 2nd largest geothermal play in the World and sees 9X potential capacity versus the current installed. ORA expects ~ 50% MW growth by 2023 and is also focused on accelerating a leading position in the US storage space. ORA has a $5B market cap and trades 12.8X EBITDA and 2.63X Book with the former seen growing 19% in 2023. ORA is a pricey Utility but growth is the best it has ever been and expect it to perform well in coming years.

California Water (CWT) bulk of business consists of the production, purchase, storage, treatment, testing, distribution and sale of water for domestic, industrial, public and irrigation uses, and the provision of domestic and municipal fire protection services. California water operations are conducted by Cal Water, which provides service to approximately 494,500 customer connections in approximately 100 California communities through 21 separate districts, which are subject to regulation by the California Public Utilities Commission (CPUC). California water operations accounted for approximately 90.3% of total customer connections and 91.9% of total consolidated operating revenue. CWT has a $3.38B market cap and trades 14.7X EBITDA with a 1.65% yield and EBITDA seen growing double digits the next two years with solid top-line growth for a Utility. If Cal Water's proposal is approved by the CPUC as submitted, it is anticipated to increase the average residential customer's bill by approximately $2.64 or 2.5% per month in 2023, $3.89 or 3.6% per month in 2024, and $3.75 or 3.3% per month in 2025.

Shoals (SHLS) screened as the most attractive alt-energy small cap into 2023 and coming off a stellar quarter. is a leading provider of electrical balance of system or “EBOS” solutions for solar energy projects. EBOS encompasses all of the components that are necessary to carry the electric current produced by solar panels to an inverter and ultimately to the power grid. EBOS components that SHLS produces include cable assemblies, inline fuses, combiners, disconnects, recombiners, wireless monitoring systems, junction boxes, transition enclosures and splice boxes. SHLS generates most of its revenues from full system solutions which integrate design and engineering support, proprietary components and innovative installation methods into a single offering that would otherwise be challenging for a customer to obtain from a single provider or at all. SHLS was the first company to successfully commercialize “plug-n-play” EBOS systems that use simple push connectors rather than the wire “crimps” used in conventional systems which allows for general labor installation rather than electricians. SHLS mainly sells to engineering, procurement and construction firms that build solar energy projects. Demand for EBOS is driven primarily by installations of new ground-mounted solar energy projects. SHLS has a market cap of $4.2B and trades 40X Earnings and 15X Sales with revenues seen rising 60% in 2023 and 40% in 2023 while EBITDA surges to $340M in 2025 from $85M in 2022. SHLS is seeing backlog surge which provides visibility into 2023 and is a major beneficiary of the IRA. The launch of new products that leverage the company's insulation and fusing patent portfolio for solar cabling and connectors will continue to drive robust growth.

Extreme Networks (EXTR) designs, develops, and manufactures wired and wireless network infrastructure equipment as well as a leading cloud networking platform and applications portfolio using cloud management, machine learning, and artificial intelligence to deliver network policy, analytics, security, and access controls. Its solutions enable companies to embrace the value of new cloud technology without having to rip and replace existing infrastructures. EXTR derives revenues from the sale of its networking equipment, software subscriptions, and related maintenance contracts. As enterprises continue to migrate increasing numbers of applications and services to either private clouds or public clouds offered by third parties and to adopt new IT delivery models and applications, they are required to make fundamental network alterations and enhancements spanning from device access points to the network core. In either case, the network infrastructure must adapt to this new dynamic environment. Intelligence and automation are key if enterprises are to derive maximum benefit from their cloud deployments. Service providers are investing in network enhancements with platforms and applications that deliver data insights, provide flexibility, and can quickly respond to new user demands and 5G use cases. The total addressable market for EXTR's Enterprise Networking solutions consisting of cloud networking, wireless local area networks, data center networking, ethernet switching, campus local area networks and software-defined wide area network solutions is approximately $33 billion and growing at approximately 12% annually over the next three years. EXTR has a market cap of $2.57B and trades 14.25X Earnings, 2.1X EV/Sales and 21X FCF with revenues seen rising 12.4% in 2023 and 12.9% in 2024 following 6.5% and 10.2% growth the prior two years while EBITDA seen growing 27.3% and 30.1%. EXTR operates with 56.6% gross margins and 12.2% EBIT margins that have been steadily growing and seen reaching 18-20%. EXTR is sitting on a record $555M backlog and continues to win market share. EXTR achieved subscription bookings growth of 60% and annualized cloud SaaS bookings of close to $190 million exiting Q1. EXTR is one of the most compelling small cap stocks in Tech with strong financials, a growing opportunity, winning market share, expanding margins and resilient earnings with its backlog in a tougher Macro.

Axcelis Tech (ACLS) designs, manufactures and services ion implantation and other processing equipment used in the fabrication of semiconductor chips. Its Purion family of products offers the most innovative implanters available on the market today. Ion implantation is a principal step in the transistor formation cycle of the semiconductor chip manufacturing process. Ion implantation is also used to change the material characteristics of the silicon for reasons other than electrical doping, a process known as "material modification." Axcelis offers a complete line of high energy, high current and medium current implanters for all application requirements. ACLS has a market cap of $2.7B and trades 16X Earnings, 22X FCF and 3.1X Sales with revenues seen rising another 33.5% in 2022 and then slowing to 5.6% growth in 2023 with the Semi cycle slowing. ACLS is well on its way to $1B in revenues and at attractive valuation, a likely M&A target in my view. Two long-term trends continue to drive business. First, Purion Power series products continue to gain strength, driven by electrification of the automotive industry. And second, the growth of IoT benefits the implant intensive mature process technology segment, greater than 80% of ACLS system revenue comes from the mature segment, which includes image sensors and power devices and other mature devices.

Globant (GLOB) is a leading global technology service provider facilitating digital transformations while many traditional IT outsourcing vendors and consulting companies have and continue to struggle. According to IDC, digital transformation spending will represent 55% of all technology investment worldwide by 2024, reaching $6.3 trillion between 2022 and 2024. Over 50% of global companies will have an enterprise-wide digital transformation strategy. GLOB seeks to maintain our status as a leading digital transformation services provider that leverages the latest technologies and methodologies to help organizations respond to the changing demands of their customers and employees. GLOB has a $7B market cap and trades 27.7X Earnings, 4.25X Sales and 15.7X EBITDA with revenues seen rising 20%+ annually and EPS seen rising 20% or higher as well. GLOB also has a very strong balance sheet. GLOB continues to deliver profitable growth leveraging on a leading global franchise with expansion in addressable market: 1) New Industries, 2) New Technologies, and 3) New Geographies (most notably APAC, after recent acquisition and recent board changes). GLOB continues to gain market share and win new business while having very strong financials, a long-term winner of the digital transformation theme.

Top 50 Attractive Micro Caps for 2023 ($250M to $2B)

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE
KALU	Kaiser Aluminum Corp.	1.2B	12.60X	0.61X	2.29%	34.33%	0.75%	0.81%
HCC	Warrior Met Coal Inc	1.8B	1.31X	0.76X	(24.663%)	16.36%	35.1%	25.75%
LXU	LSB Industries Inc	1.1B	3.38X	1.56X	(6.285%)	(26.547%)	7.09%	2.9%
AVID	Avid Technology Inc	1.1B	14.68X	2.99X	9.1%	17.33%	18.33%	102.78%
RSVR	Reservoir Media Inc	0.4B	16.30X	5.76X	10.45%	16.45%	19.74%	2.95%
TPH	Tri Pointe Homes Inc (Delaware)	1.9B	3.59X	0.74X	(21.556%)	25.06%	18.85%	13.85%
BOOT	Boot Barn Holdings Inc	1.8B	6.96X	1.16X	7.41%	9.59%	12.56%	13.67%
PLAY	Dave & Buster's Entertainment Inc	1.6B	6.08X	1.43X	21.25%	13.22%	6.26%	4.08%
XPOF	Xponential Fitness Inc	1.1B	19.33X	5.79X	17.73%	27.12%	24.86%	16.11%
FWRG	First Watch Restaurant Group Inc	0.8B	12.67X	1.22X	17.01%	14.13%	1.4%	0.04%
DTC	Solo Brands Inc	0.4B	10.05X	1.51X	13.02%	11.06%	6.92%	2.76%
KRT	Karat Packaging Inc	0.3B	6.63X	0.74X	8.29%	16.82%	7.73%	12.55%
NAPA	Duckhorn Portfolio Inc	1.9B	15.58X	5.31X	7.69%	9.09%	27.9%	7.45%
TPB	Turning Point Brands Inc	0.4B	7.04X	1.66X	4.1%	8.68%	19.89%	11.53%
AFYA	Afya Ltd	1.3B	9.29X	3.70X	13.32%	11.14%	29.94%	11.11%
DHT	DHT Holdings Inc	1.5B	10.66X	7.20X	45.89%	13.97%	23.55%	3.37%
AMK	AssetMark Financial Holdings Inc	1.7B	8.55X	2.73X	4.09%	9.7%	30.57%	10.9%
PLMR	Palomar Holdings Inc	1.3B		1.42X	32.85%		44.33%	10.41%
PX	P10 Inc	1.2B	13.83X	7.15X	23.27%	5.71%	20.52%	4.57%
ENVA	Enova International Inc	1.2B	2.68X	0.68X	16.02%	29.81%	36.02%	10.1%
VINP	Vinci Partners Investments Ltd	0.6B	18.90X	7.81X	41.6%	28.08%	47.24%	10.98%
TMDX	TransMedics Group Inc	1.9B	-73.34X	20.25X	54.36%		(21.586%)	(12.751%)
CTKB	Cytek Biosciences Inc	1.4B	46.72X	6.45X	28.98%	51.62%	14.59%	4.57%
AMPH	Amphastar Pharmaceuticals Inc	1.4B	9.44X	2.59X	8.32%	8.71%	23.24%	12.74%
KROS	Keros Therapeutics Inc	1.4B						(49.49%)

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE
QURE	Uniqure NV	1.1B	-3.80X	20.02X	434.15%	164.77%	(4107.522%)	(38.534%)
VRDN	Viridian Therapeutics Inc	1.1B	-7.40X	394.70X	(56.409%)	4.24%	(2492.469%)	(42.264%)
SGHT	Sight Sciences Inc	0.6B	-4.59X	6.26X	29.51%	(15.456%)	(116.962%)	(40.265%)
LNN	Lindsay Corp	1.8B	14.65X	2.28X	3.17%	9.18%	14.61%	15.77%
HEES	H&E Equipment Services, Inc.	1.6B	5.14X	2.12X	15.75%	6.93%	19.74%	8.72%
CTOS	Custom Truck One Source Inc	1.5B	7.47X	1.89X	8.8%	3.5%	6.46%	(4.894%)
TGLS	Tecnoglass Inc	1.5B	6.21X	2.24X	10.87%	7.45%	35.37%	39.91%
EPAC	Enerpac Tool Group Corp	1.3B	12.27X	2.42X	3.69%	12.47%	17.91%	20.72%
ERII	Energy Recovery Inc	1.2B	39.45X	8.86X	10.68%	98.12%	17.42%	10.96%
SXI	Standex International Corp	1.2B	9.24X	1.67X	9.47%	6.93%	15.04%	10.46%
CDRE	Cadre Holdings Inc	0.8B	12.22X	2.05X	8.94%	(17.843%)	9.25%	9.95%
HCCI	Heritage-Crystal Clean, Inc.	0.7B	5.55X	1.18X	10.73%	13.03%	19.64%	19.27%
DCO	Ducommun Inc	0.6B	8.58X	1.15X	6.17%	7.33%	9.23%	7.28%
AAT	American Assets Trust, Inc	1.6B	13.54X	7.65X	4.58%	1.52%	27.92%	4.12%
AGYS	Agilysys, Inc.	1.9B	61.31X	9.55X	15.97%	23.01%	14.44%	18.93%
TTMI	TTM Technologies, Inc.	1.6B	6.27X	0.87X	5.81%		10.16%	9.58%
MODN	Model N Inc	1.6B	37.84X	6.14X	12.78%	22.49%	13.69%	11.41%
INTA	Intapp Inc	1.5B	326.78X	4.48X	15.52%	82.13%	2.28%	2.67%
CLFD	Clearfield Inc	1.5B	17.20X	3.91X	20.77%	17.46%	23.41%	42.38%
DGII	Digi International Inc	1.3B	16.77X	3.60X	9.54%	20.95%	20.69%	10.71%
ATEN	A10 Networks Inc	1.2B	15.20X	3.92X	10.34%	18.87%	27.01%	25.15%
ALKT	Alkami Technology Inc	1.3B	-63.75X	5.63X	26.24%		(9.863%)	(4.651%)
MLNK	Meridianlink Inc	1.1B	13.41X	5.10X	7.3%	16.54%	16.89%	6.97%
KARO	Karooooo Ltd	0.7B	7.57X	3.35X	19.4%	19.92%	25.38%	23.83%
IBEX	Ibex Ltd	0.5B	6.69X	0.95X	9.22%	12.26%	7.47%	16.5%

Top 25 Diversified Portfolio of International Stocks for 2023

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE	Div. Yield
LIN	Linde PLC	163.0B	16.19X	5.19X	1.59%	7.44%	22.85%	10.07%	1.42%
SQM	Sociedad Quimica y Minera de Chile (ADR)	24.4B	3.99X	2.18X			53.8%	70.2%	8.36%
WPM	Wheaton Precious Metals Corp	17.7B		13.46X	6.87%	4.9%	67.68%	8.6%	
RELX	Relx PLC (ADR)	53.8B	15.99X	5.96X	9.74%	5.92%	31.22%	18.21%	241.04%
BIDU	Baidu Inc (ADR)	38.9B	6.91X	1.59X	10.34%	12.35%	22.13%	(6.202%)	
RCI	Rogers Communications Inc (USA)	22.6B	10.27X	4.31X	8.84%	14.45%	25.09%	5.87%	3.29%
PDD	Pinduoduo Inc - ADR	140.7B	22.72X	6.59X	25.17%	(16.09%)	34.65%	37.37%	
GOOS	Canada Goose Holdings Inc	1.9B	10.42X	2.73X	13.86%	14.94%	10.68%	(25.297%)	
DEO	Diageo plc (ADR)	100.2B	13.65X	4.85X	5.35%	7.73%	27.4%	11.5%	2.65%
FMX	Fomento Economico Mexicano SAB (ADR)	27.3B	157.70X	22.12X	9.95%	10.93%	8.6%	7.7%	0.08%
SHEL	Shell PLC (ADR)	397.5B	5.45X	1.15X	(5.429%)	(7.96%)	16.07%	11.38%	3.67%
GLNG	Golar LNG Limited (USA)	2.4B	8.89X	13.36X	31.69%	12.3%	106.03%	7.55%	
HDB	HDFC Bank Limited (ADR)	110.4B		634.91X	19.6%		66.12%	2.01%	0.01%
BAP	Credicorp Ltd. (USA)	10.6B		2.39X	10.82%		33.61%	1.69%	3.87%
BMA	Banco Macro SA (ADR)	1.6B		147.29X	13.75%		62.16%	10.19%	0.05%
NVO	Novo Nordisk A/S (ADR)	297.8B	25.18X	11.80X	15.25%	12.68%	44.3%	58.14%	1.28%
GMAB	Genmab A/S - ADR	28.5B	204.05X	91.68X	20.79%	21.28%	47.25%	22.9%	
RDY	Dr Reddy's Laboratories Ltd (ADR)	8.6B	987.52X	248.19X	9.7%	11.07%	24.23%	39.85%	0.01%
FERG	Ferguson PLC	25.7B	9.66X	0.98X	0.68%	3.58%	10.64%	25.0%	2.4%
CPA	Copa Holdings, S.A.	3.7B	6.92X	1.53X	18.14%	20.49%	17.75%	16.31%	1.79%
SBS	Companhia de Saneamento Bsc DEDSP (ADR)	6.9B		2.83X	8.2%	13.1%	25.28%	7.96%	
PAM	Pampa Energia S.A. (ADR)	2.8B	784.95X	347.53X	77.94%	78.76%	43.44%	18.34%	
TSM	Taiwan Semiconductor Mfg. Co. Ltd. (ADR)	397.0B	7.48X	5.09X	6.68%	11.53%	50.61%	30.02%	0.52%
NICE	Nice Ltd (ADR)	12.9B	17.18X	5.54X	11.3%	0.05%	16.28%	8.01%	0.0%
INFY	Infosys Ltd ADR	77.1B	1427.41X	337.85X	10.74%	12.9%	21.55%	26.11%	0.04%

Diversified Portfolio of 12 High Yield Stocks for 2023

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE	Div. Yield
COP	ConocoPhillips	137.6B	3.91X	1.82X	(13.066%)	(14.069%)	27.45%	17.8%	2.49%
RY	Royal Bank of Canada	129.8B		3.35X	7.35%				4.21%
USB	US Bancorp	64.5B		2.63X	19.24%		43.17%	1.45%	4.46%
KHC	Kraft Heinz Co	48.9B	11.55X	2.60X	0.66%	3.83%	17.79%	4.51%	4.01%
SPG	Simon Property Group Inc	39.9B	14.03X	13.42X	1.88%	(6.27%)	49.57%	7.92%	5.92%
NEM	Newmont Corporation	36.6B	8.52X	3.31X	0.54%	9.22%	11.31%	2.18%	4.73%
DOW	Dow Inc	35.0B	4.91X	0.82X	(9.157%)	12.43%	8.47%	7.55%	5.51%
VICI	VICI Properties Inc	33.3B	20.73X	18.47X	23.49%	2.81%	63.99%	5.15%	4.46%
TU	TELUS Corporation (USA)	28.2B		3.48X	10.98%	5.71%	18.84%	5.96%	
TROW	T Rowe Price Group Inc	24.7B	8.90X	3.57X	(5.731%)	9.22%	36.12%	14.05%	4.34%
EXR	Extra Space Storage, Inc.	20.0B	20.14X	17.27X	11.47%	2.38%	62.93%	9.17%	
AES	AES Corp	18.9B	11.71X	3.62X	1.08%	1.44%	20.98%	7.52%	2.27%

8 Contrarian Stock Picks for 2023

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE
MBLY	Mobileye Global Inc.	26.9B	39.75X	14.16X	19.64%	52.41%	31.78%	7.52%
ETSY	Etsy Inc	15.9B	25.05X	6.87X	8.85%	22.14%	(160.611%)	(151.682%)
Z	Zillow Group Inc	8.5B	11.73X	1.09X	(69.993%)	37.58%	19.88%	6.33%
FND	Floor & Decor Holdings Inc	8.0B	14.94X	1.95X	15.25%	18.74%	9.29%	10.18%
DOCS	Doximity Inc	6.8B	32.82X	14.06X	22.49%	25.43%	43.66%	15.45%
WWE	World Wrestling Entertainment, Inc.	5.5B	14.97X	4.35X	5.72%	25.69%	25.14%	27.5%
WING	Wingstop Inc	4.6B	49.96X	14.59X	17.83%	16.72%	26.24%	20.79%
AXSM	Axsome Therapeutics Inc	3.4B	-21.75X	64.89X	271.15%		(251.766%)	(81.432%)

Mobileye (MBLY) is well positioned as an annuity (ADAS) with a proven track record in computer vision that offers optionality to larger TAMs (SuperVision, AV). Mobileye's share of advanced driver assistance systems (ADAS) (currently >70%) will fall over time due to competition from Qualcomm, Tesla and others but remains a very strong business. MBLY is a high-growth (~35% Rev CAGR 2025-2030) free cash flow generating (2% FCF yield FY23, 4% FCF yield FY25) company. MBLY is trading rich at 39X EBITDA and 12X EV/Sales so it likely has downside in this environment, but the longer-term opportunity will make it a name to accumulate into weakness.

Etsy (ETSY) offers Etsy sellers a marketplace with millions of buyers along with a range of seller tools and services that are specifically designed to help creative entrepreneurs generate more sales and scale their businesses. ETSY targets a massive commerce TAM of $1.7 trillion and has been expanding its marketplace via deals for depop, Reverb and elo7 that positions it within apparel resale and Latin American markets. ETSY has a market cap of $16.8B and trades 44.6X Earnings, 25X FCF and 23.7X FY23 EBITDA with revenues seen rising 8.9% in 2023 and then accelerating in 2023 with EBITDA expected to show a similar trend. ETSY noted improving 3-year trends in October with no meaningful differences by geography, contrary to other eCommerce companies' commentary. Etsy Ads remains a new upside driver to this strong growth story. ETSY has shown better resilient than ecommerce peers and remains an excellent operator.

Zillow (Z) as a leading online real estate company faces well-known pressures from a weaker housing market but the $8.5B company is now trading 30.5X Earnings, 15X EBITDA and 3.6X EV/Sales with 2023 seen as a year with sharp declines in EBITDA and Revenues but coming out of that 2024 should be a strong growth year, so possibly name to target long in 2H23. In September, Zillow launched real time touring capability in Atlanta with plans to expand to additional markets across '23. Z has seen increased intent to transact and stronger conversion rates. Mortgage represents a large TAM (~$50bn) and Z's scale and distribution could provide them a structural advantage vs. traditional peers where customer acquisition costs run near ~25% of origination revenue. Z plans to launch its cash-offer feature (through partnership with Opendoor) in 1Q23 and roll it out to new markets throughout '23. All of these potential catalysts set up for Zillow returning to being a great investment into 2024.

Floor and Décor (FND) is a multi-channel specialty retailer of hard surface flooring and related accessories with 133 warehouse-format stores and two small design studios across 31 states. FND customers include general contractors, professional installers and other commercial businesses, Do It Yourself customers and customers who buy the products for professional installation. The combination of category and product breadth, low prices, in-stock inventory in project-ready quantities, proprietary credit offerings, integrated website and app, free design services, free storage options and dedicated customer service positions FND to gain share in the attractive Pro customer segment. Floor & Decor operates in the large, growing and highly fragmented $13 billion to $14 billion hard surface flooring market which is part of the larger $22 billion to $23 billion U.S. floor coverings market. Key long-term industry trends include increasing spend on home renovations, aging of the existing housing stock, rising level of home ownership, and favorable demographic trends. Over the last decade, hard surface flooring has consistently taken share from carpet as a percentage of the total floor coverings market, increasing from 49% of the market in 2015 to 55% in 2020. FND has a market cap of $8B and trades 24.25X Earnings, 13X EBITDA and 1.9X Sales making it look quite attractive for a name with 15-20% annual revenue growth seen and 15-20% annual EPS growth. FND faces clear Macro headwinds from the cyclical downturn in housing but is a name that has company-specific momentum to weather the storm and be a multi-year winner.

Doximity (DOCS) has a cloud-based platform that provides tools to its members, which help them to collaborate with colleagues, coordinate patient care, conduct virtual patient visits, stay up to date with medical news and research, and manage careers. The Company supports physicians in the practice of medicine with mobile and clinical workflow tools, such as voice and video telehealth, secure messaging, and digital faxing. DOCS has a market cap of $6.8B trading 44X Earnings, 43.6X FCF and 14X EV/Sales with revenues seen rising 20-25% annually and EBITDA also over 20% annual growth, a combination of profitability and strong topline growth. A key question is Doximity's ability to sustain momentum in its health systems business, which has been growing faster than the pharma business. Advertising companies are highlighting healthcare as an area of relative strength into a more difficult macro backdrop. DOCS is a bit rich but a strong multi-year story delivering against overly negative sentiment.

World Wrestling (WWE) is a sports entertainment business that includes Media, Live Events and Consumer Products. US rights renewals which are likely to be announced in 2023 will begin to drive earnings in 4Q24 with 2025 as the first full year of its new stepped-up earnings power. WWE recently spoke at a Wells Fargo Conference highlighting the upcoming rights renewal but also discussing its international focus as an area for growth. WWE also sees potential in gaming and Web3. Vince McMahon stepping down has also raised speculation the company could eventual be sold to Disney/Netflix. WE's biggest contract, the US media rights, expires in October 2024 and the renewal is expected to be announced as a key near-term catalyst and the value of sports rights has been increasing. WWE's US streaming deal with Peacock expires in early 2026; future TV and streaming rights combined. WWE has a market cap of $5.57B trading 26.8X Earnings, 4.4X Sales and 75X FCF with revenues seen slowing to 5.7% growth in 2023 but potential to see EBITDA growth start reaccelerating with the outcome of the rights renewal.

Wingstop (WING) is the largest fast casual chicken wings-focused restaurant chain in the world, with over 1,500 locations worldwide operating a 98% franchised model. The asset-light model generates strong operating margins and requires low capital expenditure. WING remains richly valued at 80X Earnings, 14.4X Sales and 40X FY23 EBITDA with revenues seen rising 15-18% annually the next two years and 17-25% EPS growth. WING could over-earn in 2023 as its main costs come down from 2022 levels while new product initiatives continue to drive strong comps and traffic. It is stepping up market with the launch of its new chicken sandwich which looks to be a hit. WING remains the best growth story in the industry with great unit economics.

Axsome (AXSM) is a biopharmaceutical company developing novel therapies for the management of central nervous system disorders for which there are limited treatment options. Its CNS portfolio includes five CNS product candidates, AXS-05, AXS-07, AXS-09, AXS-12, and AXS-14 which are being developed for multiple indications. AXSM has seen a string of successful trials in 2022 and has a lot of momentum into 2023 while also being a potential M&A target. Auvelity launch is currently in focus with strong script growth a few weeks into it. AXS-05 in ADA with a potential late 2026 launch is seen as a key driver moving forward.

Top 5 High Beta Stocks for 2023

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE
RCL	Royal Caribbean Cruises Ltd	13.6B	52.38X	4.00X	44.12%	18.06%	10.46%	5.46%
ENPH	Enphase Energy Inc	41.2B	59.88X	17.76X	37.55%	22.65%	30.56%	32.33%
SHOP	Shopify Inc (US)	44.2B	-681.57X	7.28X	20.98%	14.65%	(3.299%)	(1.787%)
WYNN	Wynn Resorts, Limited	9.7B	26.98X	5.13X	38.67%	34.09%	(4.699%)	(1.658%)
CELH	Celsius Holdings, Inc.	8.3B	106.10X	13.09X	50.33%	50.8%	4.14%	5.96%

Royal Caribbean (RCL) with a $13.84B market cap is a leading cruise company, an industry crushed by the pandemic but already rebounding and all signs of robust bookings and pricing into 2023. RCL trades < 10X EBITDA for FY23 with revenues seen up another 44% and EBITDA seen rising 434%. RCL sees plenty of upside from the cruise industry increasing its low penetration and closing the value gap to land-based holidays, has some exciting hardware and technology initiatives. Its destination strategy, particularly its private island Perfect Day, has been driving better than average pricing as well as strong on-board revenue.

Enphase (ENPH) shares have climbed 65% in 2022 as the top name in Solar and showing very little signs of slowing. ENPH now has a $41B market cap and trades 57X Earnings and 75X FCF, clearly rich, but revenues seen growing 37.6% in 2023 with 36% EBITDA growth and the IRA benefits are still not fully understood and estimates continue to revise higher. Installation forecasts keep rising and ENPH has a major opportunity with international markets.

Shopify (SHOP) shares down 75% in 2022 saw its CEO buy stock near lows and although remaining pricey at 6X FY23 EV/Sales and a lack of profits/FCF, the platform momentum continues and revenues seen rising 21% and 24% the next two years as reacceleration kicks in while profits will inflect in 2023 and start ramping. SHOP's payments strategy is evolving and although there are some risks in a GMV slowdown in 2023, SHOP's platform continues to grow strongly with penetration of ecommerce still fairly early in a long-term secular growth trend.

Wynn Resorts (WYNN) market cap below $10B seems so small for such an iconic brand and a strong set-up into 2023 as Macau has likely bottomed out. WYNN trades 13.8X FY23 EBITDA and 3.7X EV/Sales with revenues seen rising 38.7% and EBITDA seen growing 95%. WYNN is likely to see positive revisions with Macau reopening tailwinds while Domestic results remain strong and there remains upside optionality in digital.

Celsius (CLEH) is a fast-growing company in the functional energy drink and liquid supplement categories in the United States and internationally. Its core offerings include pre- and post-workout functional energy drinks, as well as protein bars. It participates in one of the stronger segments in consumer goods that has seen a lot of M&A. Studies have concluded that a single serving of CELSIUS® burns 100-140 calories (by increasing a consumer's resting metabolism an average of 12%, while providing sustained energy for up to three hours. CELH is gaining strong brand awareness and is increasing distribution with its network deal with Anheuser Busch. CELH market share was 2.8% at the end of 2021 and is seen rising to 8-10% the next few years. CELH has a market cap of $8.6B and trades rich at 105X Earnings, 70X FCF and 56X FY23 EBITDA but topline growth seen continuing with 50% growth in 2023 and 35% growth in 2024 making it one of the clear potential acquisition target sin the consolidating beverage industry.

12 Hidden Gems for 2023 (Value & Growth Trading < 100K Shares/Day)

Ticker	Company	Mkt Cap	EV/EBITDA	EV/FY1 Sales	Revenue CAGR FY1-FY2	EBITDA CAGR (FY23 to FY25)	Op. Margins	ROCE
BLTE	Belite Bio Inc (ADR)	0.8B						
ULH	Universal Logistics Holdings Inc	0.9B	3.97X	0.63X	(3.214%)	4.01%	13.8%	23.48%
INNV	InnovAge Holding Corp	0.9B	-48.66X	1.23X	5.43%		(9.697%)	(11.725%)
MOND	Mondee Holdings Inc	1.2B	80.84X	7.95X	43.26%	56.86%	(136.804%)	(98.857%)
TRDA	Entrada Therapeutics Inc	0.7B	-4.67X			26.54%		(39.093%)
POWL	Powell Industries, Inc.	0.4B	13.35X	0.56X	2.92%	23.85%	6.37%	11.1%
TRNS	Transcat, Inc.	0.5B	18.92X	2.47X	8.0%	(13.129%)	6.42%	6.91%
DSGR	Distribution Solutions Group Inc	0.7B	9.18X	0.86X	9.58%		7.03%	6.25%
CNXN	PC Connection, Inc.	1.3B	8.42X	0.37X	1.12%		4.09%	11.96%
TFPM	Triple Flag Precious Metals Corp	2.1B		10.61X	17.58%	(3.34%)	44.87%	4.08%
INTA	Intapp Inc	1.5B	326.78X	4.48X	15.52%	82.13%	2.28%	2.67%
YORW	York Water Co	0.6B		13.06X	3.39%		43.68%	6.01%

Belite Bio (BLTE) is focused on novel therapeutics targeting untreatable eye diseases involving retinal degeneration, such as atrophic age-related macular degeneration (dry AMD) and autosomal recessive Stargardt disease (STGD1), both of which progressively lead to permanent blindness, and metabolic diseases such as non-alcoholic fatty liver disease (NAFLD), non-alcoholic steatohepatitis (NASH), type 2 diabetes (T2D), and gout. BLTE has a $750M market cap and definitely falls into the speculative category but offers q unique approach to areas with unmet need and with success expect it would be a potential acquisition target with more than 100% upside.

Universal Logistics (ULH) is an asset-light provider of transportation and logistics solutions with a contract logistics segment and intermodal segment. ULH has a market cap of $910M and trades just 6X Earnings, 14X FCF and 4X EBITDA. Although the trucking industry is at a peak part of the cycle, ULH screens as an attractive name if we start to see some consolidation. ULH is seeing a sharp increase to its sales population and launched a Dedicated Transportation division in Mexico.

InnovAge (INNV) is the leading healthcare delivery platform by number of participants focused on providing all-inclusive, capitated care to high-cost, dual-eligible seniors. The company serves approximately 6,650 PACE participants, making it the largest PACE provider in the United States of America and operates 18 PACE centers across Colorado, California, New Mexico, Pennsylvania and Virginia. PACE is a fully-capitated managed care program, which serves the frail elderly, and predominantly dual-eligible, population in a community-based service model. Government payors have responded by incentivizing a transition to value-based reimbursement models for dual-eligible seniors. PACE is a government-sponsored, provider-led managed care program focused on enabling frail, dual-eligible seniors who qualify to live in a nursing home to age independently in their homes. INNV has limited direct competition, strong regulatory support, and a significant TAM. The PACE market is still significantly underpenetrated at less than 5% of TAM and INNV is roughly twice the size of the next largest player in the highly fragmented industry. INNV has a $965M market cap and trades 1.2X EV/Sales and 5X Cash with growth seen reaccelerating in 2H23.

Mondee (MOND) came public via SPAC and is a travel technology company with a platform that includes TripPro, Rocketrip, TripPlanet and UnPub. These technology- led platforms, combined with its distribution network, access to global travel inventory and its negotiated travel content. Its TripPro is a travel marketplace platform, which includes access to global content, integrated marketing tools, conversational commerce, fintech solutions, self-service booking and support. UnPub provides consumer groups with a subscription-based private membership travel platform. Its products include marketplace, global content hub, conversational commerce, fin-tech solutions, vMarket platform, business analytics, sustainability and others. MOND has a $1B market cap and trades 5X FY23 EV/Sales and 27.5X EBITDA with revenues seen rising 35-45% annually the next two years and strong profitability growth as well. MOND trades cheap given the explosive growth and look set for further market share gains with its differentiated tech.

Entrada Therapeutics (TRDA) is a clinical sage Biotech looking to transform the lives of patients by establishing Endosomal Escape Vehicle (EEV) therapeutics as a new class of medicines. EEV therapeutics are comprised of small cyclic peptides that are chemically conjugated to a wide range of specific and active biological therapeutics. TRDA is initially focused on the development of EEV therapeutics for rare neuromuscular diseases, including Duchenne muscular dystrophy (DMD) and myotonic dystrophy type 1 (DM1). TRDA has a $730M market cap and trades 3.4X Cash and is seeing some extraordinary test results in nonhuman primates. TRDA cash allows it to run through 2H24 and will be releasing data through 2023 and 2024. TRDA just had a clinical hold from the FDA hit shares which is worth monitoring.

Powell Industries (POWL) makes custom-engineered equipment and systems which (1) distribute, control and monitor the flow of electrical energy and (2) provide protection to motors, transformers and other electrically powered equipment. Its core products are used in oil and gas refining, onshore and offshore oil and gas production, petrochemical, liquefied natural gas (LNG) terminals, pipeline, terminal, mining and metals, light rail traction power, electric utility, pulp and paper and other municipal, commercial and other industrial markets. POWL is coming off a blowout quarter and the $436M company trades 31.5X Earnings, 13X EBITDA and 3.74X Cash with a 2.8% yield with revenues seen rising 7.6% in 2023 with 46% EBITDA growth.

Transcat (TRNS) is a leading provider of accredited calibration services, enterprise asset management services, and value-added distributor of professional grade handheld test, measurement and control instrumentation. TRNS is focused on providing services and products to highly regulated industries, particularly the life science industry, which includes pharmaceutical, biotechnology, medical device and other FDA-regulated businesses. TRNS also serves aerospace and defense industrial manufacturing; energy and utilities, including oil and gas and alternative energy; and other industries that require accuracy in their processes, confirmation of the capabilities of their equipment, and for which the risk of failure is very costly. TRNS with a market cap of $521M trades 37.1X Earnings and 19X EBITDA with revenues seen rising 10% in 2023 with 12.5% EBITDA growth. TRNS is seeing solid organic growth and sees opportunities for geographic expansion while also utilizing acquisitions.

Distribution Solutions (DSGR) provides value-added distribution solutions to the maintenance, repair and operations (MRO), original equipment manufacturer (OEM), and the industrial technologies markets. Its operating companies include Lawson Products, TestEquity, and Gexpro Services. DSGR has a market cap near $700M and trades 17.6X Earnings, 8X EBITDA and 1.28X Book with revenues seen rising 9.6% in 2023 with 15% EBITDA growth. DSGR has combined three core businesses and seeing strong results across each.

PC Connection (CNXN) simplifies the information technology, or IT, purchasing experience, guiding the connection between people and technology. CNXN provides a wide range of IT solutions, from the desktop to the cloud—including computer systems, data center solutions, software and peripheral equipment, networking communications, and other products and accessories. CNXN has a $1.24B market cap trading cheap at 13.5X Earnings and 44X FCF with revenues and EBITDA seen growing modestly in 2023 following a strong 2022. CNXN recently announced a special dividend and increased its buyback. CNXN may face a weaker spend environment but is priced extremely cheap and tech modernization is a trend that will continue for many years.

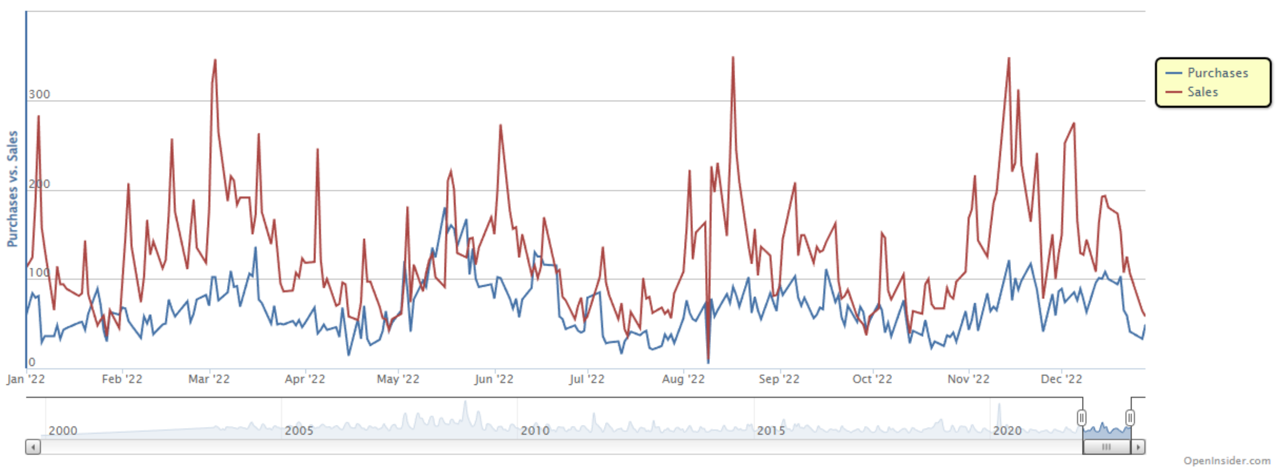
Triple Flags Precious Metals (TFPM) is a Canada-based gold-focused streaming and royalty company. The Company offers financing solutions to the metals and mining industry. It has a diversified portfolio of properties in Australia, Canada, Colombia, Mongolia, Peru, South Africa and the United States. It has a diversified portfolio of streams and royalties providing exposure primarily to gold and silver. The Company's producing streams and royalties include Northparkes, Cerro Lindo, RBPlat PGM Operations, Buritica, Fosterville, Young-Davidson, Pumpkin Hollow, Altan Tsagaan Ovoo, Gunnison, Dargues, Eagle River, Hemlo, Henty, Stawell and Renard. The Company has approximately 79 assets, consisting of over nine streams and approximately 70 royalties. TFPM has a $2.86B market cap and trades 30.65X Earnings, 14X EBITDA and 34.X FCF with a clean balance sheet and 2% dividend yield. Forecasts call for 17.6% revenue growth and 19% EBITDA growth in 2023. TFPM recently acquired Maverix Metals in a deal that should pay off for years to come.

Intapp (INTA) is a leading provider of industry-specific, cloud-based software solutions for the global professional and financial services industry. INTA provides the world's premier private capital, investment banking, legal, accounting, and consulting firms with the technology they need to meet rapidly changing client, investor, and regulatory requirements, deliver timely insights to the right professionals, and operate more competitively. Its world's premier private capital, investment banking, legal, accounting, and consulting firms with the technology they need to meet rapidly changing client, investor, and regulatory requirements, deliver timely insights to the right professionals, and operate more competitively. DealCloud and OnePlace are its main platforms. INTA has a $1.49B market cap and trades 4.5x EV/Sales with revenues seen rising 22.9% in 2023 and 15.6% in 2024 while profitability seen starting in 2023. INTA is posting impressive numbers with profitability inflecting which makes it a nice potential acquisition target.

York Water (YORW) is the oldest investor-owned water utility and the primary business of the Company is to impound, purify to meet or exceed safe drinking water standards and distribute water. The Company also owns and operates three wastewater collection systems and five wastewater collection and treatment systems. The Company operates within its franchised water and wastewater territory, which covers portions of 51 municipalities within three counties in south-central Pennsylvania. The Company obtains the bulk of its water supply from both the South Branch and East Branch of the Codorus Creek, which together have an average daily flow of 73.0 million gallons. This combined watershed area is approximately 117 square miles. YORW has a market cap of $650M and trades 31.6X Earnings, 12.6X EBITDA and 3.15X Book with a 1.79% yield.

Insider Trading

Insider buying can be an incredibly useful tool in the trading playbook whether it's identifying inflection points in longer-term turnarounds or simply when a stock gets punished following a seemingly one-time earnings event. Hundreds of Form-4 filings come in every day but looking at a very specific subset we can see where smart executives, directors, and others with knowledge of the company are putting their money. Insiders most often have a better understanding of the company's production processes, their underlying markets and trends, and more recent information than any analyst or earnings call can give so when they begin putting up sizable amounts of their own money into a stock, you should take notice.



In 2022, the Sell:Buy ratio for stocks showed an uptick in buying activity in mid to late May as the markets sold off to 52-week lows and found a summer low in late June. Insider selling activity jumped into the August rally peak registering the highest level of the whole year. The month of November saw an uptick in buying while seeing a spike in selling after the midterm elections passed. Outside of the March 2020 COVID crash, this past May 2022 saw the highest spike in insider buying since then and only surpassed by November 2018. Insider selling has seen a steady decline throughout 2021 and 2022 after peaking in March 2021, near the bubble peak of meme stock and growth stock mania.

OptionsHawk Notable Insider Database

In 2022, we tracked over 500 insider buys in the Hawk database, purchases that were culled out of the tens of 1,000s of buys throughout the year. These were the most notable buys (usually > $150k) and not part of a 10b5-1 plan where the purchase was automated. The buying highlighted here typically was a discretionary buy from the individual who saw value in the stock. Of these purchases, the best performers were buys in TDW, MBLY, FSLR, RNR, SAVA, BAND, VRNS, AMH, MLKN, PVH, TMHC and LMT. Below is a list of important buys from 2H of 2022.

Ticker	Insider Name	Title	Price	Value	Current Price	Change
ESAB	Rales Mitchell P	Dir	$40.00	$20,000,000	$49.04	22.60%
NCR	Welling Glenn W.	Dir	$21.88	$17,502,346	$23.41	6.99%
ESI	Franklin Martin E	Dir	$19.07	$17,202,420	$18.42	-3.41%
BRZE	Pepper Douglas A	Dir	$34.72	$16,965,916	$24.86	-28.40%
HUBG	Yeager David P	COB, CEO	104.99	$16,464,532	$81.78	-22.11%
KRTX	Healy James	Dir	122.8	$14,736,158	$191.95	56.31%
BRZE	Pepper Douglas A	Dir	35.01	$14,498,626	$24.86	-28.99%
CHTR	Zinterhofer Eric Louis	Dir	$374.04	$10,174,605	$332.79	-11.03%
DYN	Rhodes Jason P	Dir	$10.70	$10,000,017	$11.21	4.77%
MBLY	Shashua Amnon	CEO, Pres	$21.00	$10,000,011	$34.32	63.43%
TDW	Robotti Robert	Dir	17.85	$9,999,998	$33.64	88.46%
TDW	Robotti Robert	Dir	17.85	$9,999,998	$33.64	88.46%
TDW	Robotti Robert	Dir	$30.25	$9,075,000	$33.64	11.21%
BHVN	Coric Vlad	CEO	$10.50	$8,960,490	$12.61	20.10%
CME	Shepard William R	Dir	$170.00	$8,269,636	$167.68	-1.36%
DEI	Wang Shirley	Dir	21.17	$6,012,280	$15.99	-24.47%
SRPT	Chambers Michael Andrew	Dir	104.43	$5,963,124	$126.63	21.26%
SBUX	Hobson Mellody L	Dir	92.58	$5,068,536	$99.20	7.15%
BHVN	Coric Vlad	CEO	$10.31	$5,009,425	$12.61	22.31%
IAC	Eisner Michael D	Dir	$47.13	$5,006,792	$42.39	-10.06%
PINS	Ready William J	CEO	22.47	$5,000,009	$23.43	4.27%
RVMD	Schroeder Thilo	Dir	20	$5,000,000	$22.00	10.00%
SRPT	Chambers Michael Andrew	Dir	108.28	$4,999,230	$126.63	16.95%
HUBG	Yeager David P	COB, CEO	104.99	$4,921,826	$81.78	-22.11%
HCCI	Recatto Brian	Pres, CEO	27	$4,050,000	$32.45	20.19%
BA	Calhoun David L	Pres, CEO	$158.88	$3,972,028	$189.40	19.21%
GIII	Goldfarb Morris	CEO	$12.54	$3,135,000	$13.19	5.18%
HUBG	Yeager Phillip D	Pres, COO	104.99	$2,975,312	$81.78	-22.11%
PSN	Ball George L.	CFO	41.5	$2,905,000	$45.98	10.80%
SWK	Manning Robert J	Dir	85.5	$2,565,000	$74.41	-12.97%
ESI	Franklin Martin E	Dir	$18.90	$2,551,500	$18.42	-2.54%
MBLY	Gelsinger Patrick P	Dir	$21.00	$2,520,000	$34.32	63.43%
TCBI	Stallings Robert W	Dir	54.71	$2,430,712	$58.43	6.80%
NSA	Meisinger Chad Leroy	Dir	$39.11	$2,151,050	$36.42	-6.88%
BHVN	Coric Vlad	CEO	$14.84	$2,105,772	$12.61	-15.03%

BHVN	Bailey Gregory	Dir	$10.50	$2,100,000	$12.61	20.10%
RILY	Paulson Randall E	Dir	52.21	$2,088,379	$32.21	-38.31%
SAVA	Robertson Sanford	Dir	20.69	$2,069,000	$28.67	38.57%
ALGN	Hogan Joseph M	Pres, CEO	$188.58	$1,998,987	$204.59	8.49%
HCAT	Burton Daniel D.	CEO	$10.14	$1,998,213	$9.91	-2.27%
KO	Allen Herbert A III	Dir	$60.18	$1,997,953	$64.21	6.70%
TRU	Cartwright Christopher A	Pres, CEO	79.42	$1,985,450	$55.57	-30.03%
BKNG	Mylod Robert J Jr	Dir	1803.65	$1,803,651	$1,998.27	10.79%
UAL	Shapiro Edward	Dir	35.74	$1,787,023	$38.20	6.88%
BX	Porat Ruth	Dir	$83.55	$1,670,960	$73.68	-11.81%
BHVN	Buten Matthew	CFO	$10.50	$1,499,999	$12.61	20.10%
SWK	Ayers Andrea J.	Dir	95.69	$1,483,142	$74.41	-22.24%
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INTC	Tan Lip Bu	Dir	$29.49	$1,474,365	$25.94	-12.04%
MBLY	Pambianchi Christine M	Dir	$21.00	$1,470,000	$34.32	63.43%
PSN	Ball George L.	Dir	41.5	$1,452,500	$45.98	10.80%
APG	Malkin Anthony E	Dir	15.15	$1,396,200	$18.40	21.45%
INTC	Tan Lip Bu	Dir	$27.98	$1,346,966	$25.94	-7.29%
B	Hook Thomas J	Pres, CEO	$38.09	$1,333,035	$40.33	5.88%
ALLE	Stone John H	Pres, CEO	$104.45	$1,305,612	$105.98	1.46%
JEF	Jones Thomas W	Dir	31.21	$1,248,444	$34.60	10.86%
RILY	Paulson Randall E	Dir	49.76	$1,243,898	$32.21	-35.27%
TCBI	Stallings Robert W	Dir	64.79	$1,231,090	$58.43	-9.82%
TCBI	Stallings Robert W	Dir	55.09	$1,212,020	$58.43	6.06%
CZR	Pegram Michael E	Dir	$44.74	$1,118,573	$41.75	-6.68%
QTRX	Toloue Masoud	Pres, CEO	10.43	$1,095,150	$12.59	20.71%
WWW	Boromisa Jeffrey M	Dir	$10.49	$1,049,000	$10.41	-0.76%
WWD	Donovan Paul	Dir	94.49	$1,048,796	$95.21	0.76%
WWD	Hess David P	Dir	93.93	$1,033,230	$95.21	1.36%
NKE	Rogers John W Jr	Dir	102.97	$1,029,646	$117.56	14.17%
IGMS	Behrens M Kathleen	Dir	$17.14	$1,028,550	$15.45	-9.86%
PLD	Oconnor David P	Dir	$114.13	$1,027,170	$113.29	-0.74%
MLKN	Owen Andrea	Pres, CEO	$16.88	$1,022,963	$21.26	25.95%
CAG	Chirico Emanuel	Dir	34.06	$1,021,800	$39.02	14.56%
PLAY	Morris Christopher Daniel	CEO	30.54	$1,020,096	$34.85	14.11%
MTCH	Kim Bernard Jin	CEO	63.58	$1,017,280	$39.18	-38.38%
NEE	Ketchum John W	Pres, CEO	78.33	$1,011,162	$84.00	7.24%
LYV	Iovine Jimmy	Dir	$73.28	$1,006,867	$69.59	-5.04%
VRNS	O'Boyle James	SVP of Worldwide Sales	$16.72	$1,003,200	$22.65	35.47%
HOG	Zeitz Jochen	Pres, CEO	38.94	$1,002,628	$41.01	5.32%
HOMB	Lieblong Alex R	Dir	25.04	$1,001,766	$22.71	-9.31%
HOMB	Lieblong Alex R	Dir	25.04	$1,001,766	$22.71	-9.31%
VRT	Deangelo Joseph J	Dir	$13.99	$1,001,684	$12.58	-10.08%
PVH	Larsson Stefan	CEO	53.94	$1,000,000	$71.18	31.96%
RVMD	Kim Lorence H.	Dir	20	$1,000,000	$22.00	10.00%
FSLR	Antoun Georges	Chief Commercial Officer	100.53	$999,871	$150.22	49.43%
MBLY	Yeboah-Amankwah Safroadu	Dir	$21.00	$997,899	$34.32	63.43%
B	Hook Thomas J	Pres, CEO	$36.27	$997,295	$40.33	11.19%
HCAT	Burton Daniel D.	CEO	10.99	$996,970	$9.91	-9.83%
UAL	Shapiro Edward	Dir	$39.79	$994,725	$38.20	-4.00%

KKR	Cohler Matt	Dir	52.99	$991,485	$45.89	-13.40%
FCX	Lance Ryan Michael	Dir	31.88	$988,314	$38.88	21.96%
RNR	Gray Brian Gerald John	Dir	130.62	$979,650	$186.95	43.13%
VPG	Cummins Wes	Dir	$38.98	$974,587	$38.63	-0.90%
PKOH	Crawford Edward F	Dir	19.38	$969,116	$12.55	-35.24%
PRG	Doman Curtis Linn	Chief Innovation Officer-PRC	19.25	$962,500	$17.14	-10.96%
BKNG	Mylod Robert J Jr	Dir	1912.36	$956,183	$1,998.27	4.49%
ADBE	Durn Daniel	EVP, CFO	288.11	$936,358	$335.09	16.31%
SBUX	Allison Richard E Jr	Dir	92.53	$925,320	$99.20	7.21%
ET	Brannon Richard D	Dir	$11.55	$923,810	$11.90	3.03%
CRK	Turner Jim L	Dir	18.34	$917,195	$14.57	-20.56%
MBLY	McCaskill Claire C.	Dir	$21.00	$861,000	$34.32	63.43%
SAVA	Barry Richard	Dir	23.79	$860,223	$28.67	20.51%
TCBI	Stallings Robert W	Dir	$55.85	$832,192	$58.43	4.62%
ALKS	Daglio David Angelo Jr.	Dir	$23.31	$815,735	$25.19	8.07%
VPG	Cummins Wes	Dir	$40.10	$802,067	$38.63	-3.67%
INSM	Lee Leo	Dir	$17.69	$796,050	$19.01	7.46%
EVA	Bumgarner John C Jr	Dir	$51.34	$770,100	$52.58	2.42%
SMCI	Chan Shiu Leung	Dir	$83.76	$753,840	$82.89	-1.04%
KSS	Boneparth Peter	Dir	30.01	$750,130	$25.10	-16.36%
PSA	Russell Joseph D Jr	Pres, CEO	$297.66	$744,137	$283.04	-4.91%
COIN	Lutke Tobias	Dir	$44.34	$742,514	$32.65	-26.36%
UNVR	Alexos Nicholas W	EVP, CFO	26.19	$654,665	$31.99	22.15%
RILY	Paulson Randall E	Dir	52.33	$654,174	$32.21	-38.45%
KW	Zax Stanley R	Dir	18.15	$635,250	$15.79	-13.00%
DINO	Myers Franklin	Dir	$60.88	$608,800	$50.93	-16.34%
MBLY	Yeary Frank D	Dir	$21.00	$577,500	$34.32	63.43%
DLR	Stein A William	CEO	113.22	$566,100	$100.35	-11.37%
CCOI	Montagner Marc	Dir	$54.88	$548,750	$56.83	3.55%
ZS	Brown Andrew William Fraser	Dir	$108.78	$543,900	$107.57	-1.11%
INSM	Sharoky Melvin Md	Dir	$17.59	$527,600	$19.01	8.07%
ALKT	Hill W Bryan	CFO	$12.97	$518,816	$13.17	1.54%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	39.85	$517,213	$36.10	-9.41%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	39.66	$514,747	$36.10	-8.98%
PRMW	Harrington Thomas	CEO	13.07	$509,691	$15.69	20.05%
DEI	Feinberg David T	Dir	20.31	$507,750	$15.99	-21.27%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	38.97	$506,064	$36.10	-7.36%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	38.93	$505,272	$36.10	-7.27%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	38.79	$503,455	$36.10	-6.93%
OEC	Painter Corning F.	CEO	16.77	$503,124	$17.71	5.61%
PLAY	Klohn Steve	SVP CIO	$35.18	$502,684	$34.85	-0.94%
PLAY	Wehner Tony	SVP, COO	$33.86	$501,913	$34.85	2.92%
AZTA	McManus Matthew	EVP, COO	58.15	$501,544	$58.03	-0.21%
AZEK	Hendrickson Gary E	Dir	18.47	$501,368	$20.69	12.02%
SEAS	Finazzo Christopher L.	Chief Commercial Officer	55.99	$501,086	$53.02	-5.30%
CMTG	Walter W Edward	Dir	18.54	$500,206	$15.51	-16.34%
VRNS	Melamed Guy	CFO, COO	$20.50	$500,200	$22.65	10.49%
SAGE	Greene Barry E	Pres, CEO	$34.48	$500,022	$37.53	8.85%
BECN	Harrell Martin S.	Pres, Waterproofing	$55.50	$500,000	$53.15	-4.23%
HD	Santilli Paula	Dir	$315.80	$499,911	$319.55	1.19%
PDM	Swope Jeffrey L.	Dir	11.9	$499,800	$9.32	-21.68%
MGM	Swartz Janet	Dir	35.05	$498,784	$33.87	-3.37%
MED	Brown Jeffrey J	Dir	126.54	$498,549	$114.72	-9.34%
DEI	Bider Leslie E	Dir	19.94	$498,500	$15.99	-19.81%

DBRG	Ganzi Marc C	CEO	17.83	$498,224	$10.70	-39.99%
SSB	Page G Ruffner Jr	Dir	$78.94	$497,322	$76.90	-2.58%
DEI	Simon William E Jr	Dir	19.89	$497,250	$15.99	-19.61%
WWD	Donovan Paul	Dir	93.35	$494,752	$95.21	1.99%
EIG	Antonello Katherine H.	Pres, CEO	37.81	$491,530	$43.45	14.92%
VFC	Hoplamazian Mark Samuel	Dir	$28.04	$490,712	$27.16	-3.14%
SGRY	Deluca Teresa	Dir	$24.50	$490,000	$26.51	8.20%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	37.7	$489,308	$36.10	-4.24%
DBRG	Ganzi Marc C	CEO	15.22	$487,040	$10.70	-29.70%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	36.72	$476,589	$36.10	-1.69%
NRG	Coben Lawrence S	Dir	$31.70	$475,500	$32.24	1.70%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	36.36	$471,916	$36.10	-0.72%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	36.17	$469,450	$36.10	-0.19%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	35.96	$466,725	$36.10	0.39%
KDP	Milikin Maurice Anthony	Chief Supply Chain Officer	35.75	$463,999	$36.10	0.98%
WOLF	Le Duy Loan T	Dir	$90.98	$454,920	$69.81	-23.27%
HUN	Espeland Curtis E	Dir	30.18	$452,645	$27.77	-7.99%
FTAI	Adams Joseph P. Jr.	CEO, COB	$18.00	$450,000	$17.20	-4.44%
COHR	Corasanti Joseph J	Dir	43.84	$438,440	$33.03	-24.66%
HUBG	Yablon Gary	Dir	85.6	$428,000	$81.78	-4.46%
CRK	McGough Patrick	VP of Operations	14.86	$427,968	$14.57	-1.95%
CERT	Schemick Michael Andrew	CFO	16.64	$416,000	$15.85	-4.75%
VFC	Carucci Richard	Dir	41.44	$414,420	$27.16	-34.46%
EHAB	Jacobsmeyer Barbara Ann	Pres, CEO	13.78	$413,400	$12.72	-7.69%
WMS	Perez De La Mesa Manuel J	Dir	$81.90	$409,500	$82.28	0.46%
DINO	Myers Franklin	Dir	55.94	$405,565	$50.93	-8.96%
NEOG	Adent John Edward	Pres, CEO	23.07	$403,725	$14.88	-35.50%
MMS	Ruddy Raymond B	Dir	$69.91	$400,584	$74.44	6.48%
COIN	Lutke Tobias	Dir	$46.04	$399,857	$32.65	-29.08%
RILY	Sheldon Michael Joseph	Dir	$39.86	$399,627	$32.21	-19.19%
PLAY	Lehner Les	SVP, Chief Procurement Ofc	$32.81	$398,741	$34.85	6.22%
COIN	Lutke Tobias	Dir	$72.90	$389,942	$32.65	-55.21%
COIN	Lutke Tobias	Dir	$65.29	$387,888	$32.65	-49.99%
COIN	Lutke Tobias	Dir	$69.09	$387,595	$32.65	-52.74%
COIN	Lutke Tobias	Dir	$68.99	$385,309	$32.65	-52.67%
COIN	Lutke Tobias	Dir	$55.00	$382,360	$32.65	-40.64%
COIN	Lutke Tobias	Dir	97.24	$382,153	$32.65	-66.42%
COIN	Lutke Tobias	Dir	$42.35	$380,049	$32.65	-22.90%
COIN	Lutke Tobias	Dir	67.95	$378,957	$32.65	-51.95%
COIN	Lutke Tobias	Dir	$66.96	$373,168	$32.65	-51.24%
COIN	Lutke Tobias	Dir	$67.61	$373,140	$32.65	-51.71%
COIN	Lutke Tobias	Dir	71.94	$372,433	$32.65	-54.61%
DOC	Thompson Tommy G	Dir	$15.13	$368,130	$14.71	-2.78%
COIN	Lutke Tobias	Dir	$34.75	$365,570	$32.65	-6.04%
COIN	Lutke Tobias	Dir	62	$365,428	$32.65	-47.34%
COIN	Lutke Tobias	Dir	90.55	$364,283	$32.65	-63.94%
COIN	Lutke Tobias	Dir	68.19	$360,793	$32.65	-52.12%
VST	Helm Scott B	Dir	$23.74	$356,125	$23.69	-0.21%
DVA	Nehra John M	Dir	$71.14	$355,675	$73.90	3.88%
COIN	Lutke Tobias	Dir	$54.50	$353,978	$32.65	-40.09%
BALL	Fisher Daniel William	Pres, C.E.O.	$54.42	$348,317	$51.79	-4.83%
TREE	Ernst Mark A	Dir	34.68	$346,789	$17.91	-48.36%
CBSH	Brauer Blackford F	Dir	68.87	$344,372	$66.88	-2.89%
SMCI	Chan Shiu Leung	Dir	$76.00	$341,994	$82.89	9.07%
COIN	Lutke Tobias	Dir	75.39	$337,898	$32.65	-56.69%
ADBE	Ricks David A	Dir	$280.56	$336,672	$335.09	19.44%
GPN	Baldwin Robert H B Jr	Dir	$98.62	$335,308	$97.68	-0.95%
CRL	Wallman Richard F	Dir	$218.90	$328,350	$218.92	0.01%
CERT	McLean Stephen M.	Dir	16.32	$326,400	$15.85	-2.88%
APG	Malkin Anthony E	Dir	15.4	$326,289	$18.40	19.48%

GSHD	Miller Mark	Pres, COO	$40.01	$320,092	$35.96	-10.12%
TSE	Cote Jeffrey J	Dir	31.76	$317,600	$23.22	-26.89%
CNXC	Valentine Andre S	CFO	126.99	$317,475	$133.19	4.88%
NEOG	Adent John Edward	Pres, CEO	$14.37	$316,140	$14.88	3.55%
BMRN	Alles Mark J	Dir	$86.75	$314,469	$102.16	17.76%
MRVL	Strachan Michael G	Dir	46.32	$314,096	$36.05	-22.17%
QTRX	Doyle Michael A	CFO, Treasurer	10.3	$308,921	$12.59	22.23%
BX	Brown Reginald J	Dir	99.35	$307,986	$73.68	-25.84%
CRK	Foster Morris E	Dir	17	$306,040	$14.57	-14.29%
B	Streich Julie K	SVP, Finance, CFO	$37.56	$304,266	$40.33	7.37%
RYI	Larson Stephen P.	Dir	$30.37	$303,717	$30.53	0.53%
ELAN	Hoover R David	Dir	15.18	$303,614	$11.57	-23.78%
FAST	Watts Jeffery Michael	Exec Vice-Pres	$50.58	$300,433	$47.49	-6.11%
ROG	Wallace Peter C	Dir	$100.13	$300,393	$112.49	12.34%
LPX	Haughie Alan	EVP, CFO	55.78	$300,208	$60.31	8.12%
ATR	Trerotola Matthew L.	Dir	$94.48	$299,504	$110.87	17.35%
KSS	Prising Jonas	Dir	29.67	$296,694	$25.10	-15.40%
TARS	Lin Elizabeth Yeu	Dir	16.12	$296,606	$14.21	-11.85%
WWD	Donovan Paul	Dir	98.85	$296,550	$95.21	-3.68%
WBD	Zeiler Gerhard	Pres, International	14.69	$293,800	$9.23	-37.17%
DAL	Taylor David S	Dir	29.31	$293,100	$32.90	12.25%
HASI	Rose Nathaniel	EVP, CIO	$28.94	$289,390	$29.54	2.07%
NRG	Carrillo Antonio	Dir	$31.71	$285,390	$32.24	1.67%
ALGN	Myong Anne	Dir	$190.26	$285,385	$204.59	7.53%
VFC	Dorer Benno O	Interim Pres, CEO	$28.50	$284,950	$27.16	-4.70%
PRG	Michaels Steven A	Pres, CEO	18.91	$283,590	$17.14	-9.36%
BOOT	Starrett Peter	Dir	70.88	$283,505	$59.58	-15.94%
APO	Clayton Walter Joseph III	Dir	56.07	$280,349	$63.41	13.09%
PMT	Spector David	COB, CEO	13.71	$274,210	$13.15	-4.08%
VFC	McMullen W Rodney	Dir	44.76	$268,572	$27.16	-39.32%
CME	Tierney Robert J Jr	Dir	$176.55	$264,825	$167.68	-5.02%
UNP	Finley Teresa	Dir	$188.26	$259,799	$210.32	11.72%
AVTR	Szlosek Thomas A	EVP, CFO	$20.71	$258,850	$20.47	-1.16%
GNTX	Downing Steven R	Pres, CEO	$25.74	$257,400	$27.12	5.36%
VFC	Otis Clarence Jr	Dir	$28.32	$254,873	$27.16	-4.10%
CRK	Foster Morris E	Dir	18.16	$254,240	$14.57	-19.77%
TMHC	Steffens Louis	EVP, CFO	23.07	$253,770	$30.84	33.68%
MRCY	Lance Howard L	Dir	50.59	$252,963	$43.69	-13.64%
TCBI	Storms Timothy J	Chief Risk Officer	$57.21	$251,724	$58.43	2.13%
SRC	Gilchrist Richard I	Dir	$41.91	$251,459	$40.67	-2.96%
ONB	Brown Thomas Lynn	Dir	16.74	$251,100	$17.82	6.45%
LMT	Donovan John	Dir	$441.43	$250,732	$485.50	9.98%
AZTA	Robertson Lindon G	EVP, CFO	57.62	$250,647	$58.03	0.71%
LMT	Donovan John	Dir	396.16	$250,373	$485.50	22.55%
TRS	Finley Teresa	Dir	26.73	$250,099	$27.90	4.38%
GBX	Garza Antonio O	Dir	30.5	$249,967	$34.48	13.05%
HLF	Johnson Michael	COB, interim CEO	$12.69	$249,646	$14.80	16.63%
DINO	Myers Franklin	Dir	51.98	$249,504	$50.93	-2.02%
EPD	Rutherford John R	Dir	$24.88	$248,824	$24.09	-3.18%
NXRT	Laffer Arthur B	Dir	52.92	$248,777	$43.66	-17.50%
DEI	Simon William E Jr	Dir	$18.73	$247,236	$15.99	-14.63%
CCI	Stephens Kevin A	Dir	$123.50	$247,000	$136.93	10.87%
HPP	Glaser Jonathan M	Dir	12.28	$245,600	$9.82	-20.03%
SGRY	Turner Brent	Dir	$24.50	$245,000	$26.51	8.20%
BKR	Dumais Michael R	Dir	24.39	$243,900	$29.37	20.42%
CRK	Foster Morris E	Dir	17.39	$243,410	$14.57	-16.22%
APG	Malkin Anthony E	Dir	15.36	$240,710	$18.40	19.79%
WOLF	Le Duy Loan T	Dir	120.34	$240,677	$69.81	-41.99%
OSTK	Tabacco Joseph J Jr	Dir	$23.88	$238,800	$18.43	-22.82%
JBGS	Estes Scott A	Dir	23.15	$231,500	$19.44	-16.03%

CNP	Smitherman Barry T	Dir	$28.38	$227,167	$30.92	8.95%
WOLF	Le Duy Loan T	Dir	$74.97	$224,900	$69.81	-6.88%
JELD	Nord David G	Dir	11	$220,000	$9.85	-10.45%
ESS	Johnson Amal M	Dir	$218.44	$218,440	$210.94	-3.43%
MODG	Lynch Brian P.	EVP, CFO	$21.64	$216,422	$19.43	-10.21%
KMPR	Parker Stuart B.	Dir	42.55	$212,750	$49.62	16.62%
KD	Ungerleider Howard I	Dir	10.59	$211,752	$10.78	1.79%
WEX	Groch James R	Dir	$151.25	$211,750	$162.40	7.37%
RAMP	Kokich Clark M	Dir	20.02	$210,210	$23.28	16.28%
MBLY	Desheh Eyal	Dir	$21.00	$210,000	$34.32	63.43%
CRK	Turner Jim L	Dir	$13.91	$208,691	$14.57	4.74%
FDX	Vena Vincenzo J	Dir	230.05	$207,041	$177.05	-23.04%
SIX	Mick Gary	CFO	$21.75	$206,622	$22.85	5.06%
WOR	Blom David P	Dir	$41.29	$206,428	$49.99	21.07%
SRI	Schlather Paul J.	Dir	18.85	$205,691	$21.28	12.89%
FLNC	Nebreda Julian	Dir	17	$203,952	$15.74	-7.41%
PGTI	Feintuch Richard D	Dir	$20.30	$203,000	$17.99	-11.38%
PNTG	Nackel John G.	Dir	$10.13	$202,600	$10.18	0.49%
BA	Mollenkopf Steven M	Dir	$157.09	$201,861	$189.40	20.57%
KELYA	Parfet Donald R	Dir	18.34	$201,720	$16.85	-8.12%
LPLA	Simonich Brent	EVP, CAO, Treasurer	$219.15	$201,618	$213.61	-2.53%
CRK	Foster Morris E	Dir	$14.33	$200,978	$14.57	1.67%
GEL	Flynn Edward T	Pres, Genesis Alkali, LLC	$10.02	$200,400	$9.43	-5.89%
FSLR	Bradley Alexander R.	CFO	100.56	$200,114	$150.22	49.38%
VST	Barbas Paul M	Dir	24.9	$199,174	$23.69	-4.86%
JELD	Wynne Steven E	Dir	11.07	$199,170	$9.85	-11.02%
EVA	Alexander Ralph	Dir	$51.68	$198,968	$52.58	1.74%
NOTV	Beattie John Gregory	COO	22.34	$198,826	$4.66	-79.14%
ARNC	Austen William F.	Dir	$19.84	$198,406	$21.19	6.80%
UAL	Kennedy James A C	Dir	$39.33	$196,635	$38.20	-2.87%
GNRC	Dixon Robert D	Dir	$97.27	$194,550	$91.15	-6.29%
WWD	Donovan Paul	Dir	92.02	$193,242	$95.21	3.47%
LOVE	Krause Albert Jack	Chief Strategy Officer	$19.17	$191,700	$20.99	9.49%
COMM	Lorentzen Kyle David	EVP, CFO	10.69	$189,209	$7.08	-33.77%
XRAY	Lucier Gregory T	Dir	$31.45	$188,700	$32.07	1.97%
BOOM	Cohen Robert A	Dir	18.75	$187,500	$18.41	-1.81%
FFIN	Denny Michael B.	Dir	$37.35	$186,750	$33.72	-9.72%
FFIN	Anthony April Kaye Bullock	Dir	$36.80	$184,000	$33.72	-8.37%
GXO	Wilson Malcolm	CEO	$43.97	$183,531	$43.01	-2.18%
PGTI	Feintuch Richard D	Dir	$18.18	$181,750	$17.99	-1.05%
NSA	Warren J. Timothy	Dir	$38.00	$177,840	$36.42	-4.16%
EHAB	Lamonica Susan	Dir	11.72	$175,800	$12.72	8.53%
HCAT	Gallagher Duncan	Dir	11.66	$174,947	$9.91	-15.01%
PRMW	Stanbrook Steven P	Dir	13.09	$174,789	$15.69	19.86%
SNBR	Howard Julie	Dir	$26.31	$170,983	$25.43	-3.34%
AMH	Benham Douglas N	Dir	$22.46	$169,968	$30.26	34.73%
EPD	Rutherford John R	Dir	25.78	$167,543	$24.09	-6.56%
BAND	Roush Lukas M.	Dir	16.25	$162,500	$22.42	37.97%
SIX	Mick Gary	CFO	$21.56	$161,705	$22.85	5.98%
PLAY	Quartieri Michael	CFO	$31.73	$158,633	$34.85	9.83%
XRX	Palau Hernandez Margarita	Dir	$15.55	$155,489	$14.70	-5.47%
SIX	Mick Gary	CFO	$22.12	$154,840	$22.85	3.30%
BOOT	Watkins James M	CFO, Secretary	60.83	$152,083	$59.58	-2.05%
ARRY	Schmid Gerrard	Dir	21.66	$151,650	$18.97	-12.42%
CCI	Thornton Matthew III	Dir	$123.78	$150,398	$136.93	10.62%
ELAN	Herendeen Paul	Dir	15.03	$150,250	$11.57	-23.02%

Insider activity is mainly only worth following on the buying side as management only buys its stock for one reason, expectations the stock is undervalued and heading higher, often being a key inflection point for a stock in a downtrend. Tracking insider selling provides very little value as management sells stock for a variety of reasons, and it provides little historical evidence of being a signal. Below are a few notable names that saw insider buys *and are still within 5% of the purchase price.*

Brooks Automation (AZTA) is still within 5% of where the CFO and COO purchased shares this year near $58 and over $750K between the two executives. The stock has recently gapped up on stronger earnings and now forming a bullish consolidation pattern above the 55-day EMA. A close over 62.50 where the 200-day sits would be a strong sign of a longer-term low being in place and potential trend shift higher towards 80+ into 2023. The $3.9B life sciences solutions company trades at 26x EBIDTA, 2.7x sales, FCF yield of 2% and still has impressive growth expected of +29% in FY23 and +12% estimated for FY24. Average analyst price target is at $70 and recently announced a $1.5B share buyback. Needham raised its target last month to $78 and keeps a Buy rating after the Q4 earnings beat citing management expectations that growth and margins likely bottomed as guidance for FY23 calls for both to improve.

Keurig Dr Pepper (KDP) is still near the price level of where the Chief Supply Chain Officer purchased shares this year between $35 and $48 and over $2.8M in total. The stock is flat in 2022 but outperforming the market as a lower beta staple name and made a high of 41 earlier in August before now pulling back to the top edge of yearly value area support near 35.50. The stock should hold up here and form a low to rebound higher above 40 into 2023. The $50.7B beverage company trades at 14.3x earnings, 4.2x sales, FCF yield of 5.4% and growth expected of +11% in FY22 and +5% estimated for FY23. Average analyst price target is at $40 and recently announced a minority stake in Athletic Brewing Company, a non-alcoholic craft beer maker. The transaction represents KDP's latest move into rapidly emerging beverage categories, following its acquisition of non-alcoholic ready-to-drink cocktail brand Atypique. Wedbush initiated with an Outperform rating and $43 target recently and made KDP a Top Pick as they view them as the most underappreciated to core peers based on relative valuation despite the same long-term targets. With capacity constraints now behind them in coffee, we expect revenue and profitability to accelerate with a continued benefit from the hybrid work model.

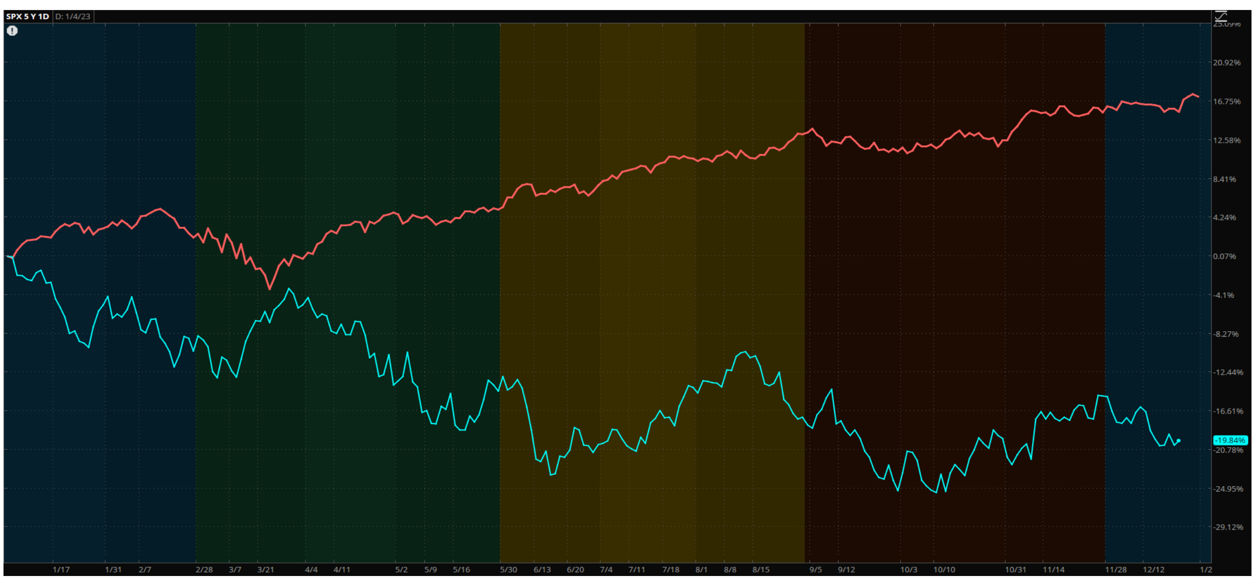
Woodward (WWD) is still within 3% of where a few different directors purchased shares this year near $93 and over $3M in total buys between the two insiders. The stock has held up better than others and recently has rallied through Q4 as industrials see positive money flows. WWD made a low near 80 back in October just above the 61.8% fib retracement of the rally from the March 2020 lows and now trying to regain the 200 EMA near 97.50. The stock has resistance at 100 and 103 but above that can breakout of a large, inverted head and shoulders bottoming pattern and target a move to 120 in 2023. The $5.6B aerospace designer company trades at 26x earnings, 2.3x sales, FCF yield of 4.3% and growth expected of +11% in FY23 and +8% estimated for FY24. Average analyst price target is at $98 and recently was started at Outperform at Wolfe Research with a $100 price target citing that WWD is positioned well to benefit from recoveries in the commercial OEM and aftermarket.

Seasonality

Typically, in this space, I'll highlight 10-15 names which have seasonal strength over a stretch of months each year. The overall indices, as well as individual stocks, have long had seasonal cycles throughout the year where certain groups outperform and others lag. They do not work every year as macro events can cause volatility, but longer-term certain themes have emerged and some of the more commonly held effects like "Sell in May and Go Away" and the "Santa Claus Rally" have legs. In 2023, we'll also deal with the seasonal effects of the Presidential Cycle as we enter a Pre-Election year. This section will give you an outline of where historically indices and sectors have been strongest.

The S&P 500

In 2022, the markets got the typical midterm election year weakness which evolved into a full-fledged bear market. The early year weakness beginning in January with a -5.3% decline forecasted a down year ahead as the rule of "so goes January so goes the year" played out. A bear market rally in March gave way to a -8.8% April and another -8.2% drop in June to round out the first half of year. With investors very bearish sentiment wise and the month of July seasonally strong it set up a very strong bear market bounce during Summer as July was the best month of the year adding +9.2% to the SPX and making it the 8th straight higher July and 12 of the last 14 higher since 2009. This year July was also the strongest it's been in our 30-year data set. The seasonally weaker months of August and September have negative returns over the past 30 years and this time played out as expected in 2022, being down -4.1% and -9.2% respectively. During midterm years the market has historically found its bottom in this 3rd or 4th quarter of the year and the October 13th low has still held as the low for the year as December wraps up. October served as the 2nd best month of 2022 being up +8.1% and Q4 of 2022 looks to be the only positive quarter of the year and seasonally right on track as Q4 of midterm years have shown outperformance the past 100 years.



If we look at SPX **monthly returns** going back to January 1993, we see the average monthly return is 0.90%, the max gain is 12.68%, and the minimum is -16.51%. We've had 33 months with a loss of 5% or more and 4 of them were in 2022. Six of those months have been in August, six in September, and four in June. We've had 51 months with a 5% gain or more in that period including three in 2022. Eight of those were in October, seven of those were in November, five of those were in April, and five of those were in July. Here's a 30-year mosaic of monthly returns for the S&P since 1993:

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1993	-0.1	1.1	2.2	-2.6	2.7	0.4	-0.5	3.8	-0.7	2.0	-1.1	1.2
1994	3.5	-2.9	-4.2	1.1	1.6	-2.3	3.2	3.8	-2.5	2.9	-4.0	0.7
1995	3.4	4.1	2.8	3.0	4.0	2.0	3.2	0.4	4.2	-0.3	4.4	1.6
1996	3.6	0.3	1.7	1.1	2.3	0.9	-4.5	1.9	5.6	3.2	7.3	-2.4
1997	6.2	1.0	-4.4	6.3	6.3	4.1	7.9	-5.2	4.8	-2.4	3.9	1.9
1998	1.3	6.9	4.9	1.3	-2.1	4.3	-1.4	-14.1	6.4	8.1	5.6	6.5
1999	3.5	-3.2	4.2	3.8	-2.3	5.5	-3.1	-0.5	-2.2	6.4	1.7	5.7
2000	-5.0	-1.5	9.7	-3.5	-1.6	2.0	-1.6	6.5	-5.5	-0.5	-7.5	-0.5
2001	4.4	-9.5	-5.6	8.6	-0.6	-2.4	-1.0	-5.9	-8.2	1.3	7.8	0.6
2002	-1.0	-1.8	3.3	-5.8	-0.6	-7.4	-7.9	0.7	-10.5	8.2	6.2	-5.7
2003	-2.5	-1.4	0.2	8.5	5.5	1.1	1.8	2.1	-1.1	5.4	1.1	5.0
2004	2.0	1.4	-1.3	-1.9	1.7	1.9	-3.2	0.2	1.0	1.3	4.5	3.0
2005	-2.3	2.1	-1.8	-1.9	3.2	0.2	3.8	-0.9	0.8	-2.4	4.4	-0.2
2006	2.4	0.6	1.7	1.3	-3.0	0.3	0.4	2.2	2.7	3.2	2.0	1.3
2007	1.5	-2.0	1.2	4.4	3.4	-1.5	-3.1	1.3	3.9	1.4	-3.9	-1.1
2008	-6.1	-2.6	-0.9	4.8	1.5	-8.4	-0.9	1.6	-9.4	-16.5	-7.0	1.0
2009	-8.2	-10.8	8.4	9.9	5.8	-0.1	7.5	3.7	3.6	-1.9	6.2	1.9
2010	-3.6	3.1	6.1	1.5	-7.9	-5.2	6.8	-4.5	9.0	3.8	0.0	6.7
2011	2.3	3.5	0.0	2.9	-1.1	-1.7	-2.0	-5.5	-7.0	10.9	-0.4	1.0
2012	4.6	4.3	3.2	-0.7	-6.0	4.1	1.2	2.5	2.5	-1.8	0.6	0.9
2013	5.1	1.3	3.8	1.9	2.4	-1.3	5.2	-3.0	3.2	4.6	3.0	2.6
2014	-3.5	4.6	0.8	0.7	2.3	2.1	-1.4	3.9	-1.4	2.4	2.8	-0.3
2015	-3.0	5.6	-1.6	1.0	1.3	-2.0	2.3	-6.1	-2.5	8.5	0.4	-1.7
2016	-5.0	-0.1	6.7	0.4	1.7	0.4	3.7	0.1	0.0	-1.7	3.7	2.0
2017	1.8	3.9	0.1	1.0	1.4	0.6	2.1	0.3	2.0	2.4	3.1	1.2
2018	5.6	-3.6	-2.7	0.5	2.4	0.6	3.7	3.2	0.6	-6.9	1.9	-9.2
2019	7.9	3.0	1.8	3.9	-6.6	6.9	1.3	-1.8	1.7	2.0	3.4	2.9
2020	-0.2	-8.4	-12.5	12.7	4.5	1.8	5.5	7.0	-3.9	-2.8	10.8	3.7
2021	-1.1	2.6	4.2	5.2	0.6	2.2	2.3	2.9	-4.8	6.9	-0.8	4.6
2022	-5.3	-3.0	3.8	-8.8	0.2	-8.2	9.2	-4.1	-9.2	8.1	5.6	
Average	0.41	-0.05	1.19	2.02	0.77	0.02	1.35	-0.12	-0.57	1.86	2.18	1.21
Max	7.90	6.93	9.69	12.68	6.31	6.90	9.20	7.01	8.95	10.92	10.75	6.68
Minimum	-8.22	-10.75	-12.51	-8.80	-7.94	-8.35	-7.88	-14.11	-10.48	-16.51	-7.46	-9.20
Median	1.40	0.77	1.69	1.27	1.56	0.47	1.55	0.56	0.31	2.18	2.86	1.24
1 Std. Dev	4.13	4.30	4.46	4.51	3.50	3.70	3.98	4.44	5.02	5.39	4.15	3.33

The **Nasdaq (QQQ) and Dow Jones (DIA)** follow a similar seasonal pattern as the S&P. On a month-to-month basis, the best performing times of year are April, July, October, and November. The worst months are February and September. Over the last 22 years, the Nasdaq has averaged 0.90% return per month. The Dow averages 0.42% per month.

The **QQQ** tends to have bigger extremes than either the S&P or the Dow. In 2022, the index had seven months with a 5% or greater absolute move, July being best at +12.5% and April the worst month at -13.6%. The best month for the Nasdaq over the last 22-years was a 18.5% return in October 2002. The worst month was February 2001 when the group fell 26.2%. The average max gain is 11.6% while the average max loss is a 14.3% decline.

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2001	10.2	-26.2	-17.5	17.9	-3.1	2.2	-8.6	-12.3	-20.9	17.0	17.0	-1.9
2002	-1.0	-12.3	6.8	-12.0	-5.3	-13.1	-8.6	-1.5	-11.8	18.5	12.9	-12.1
2003	0.3	3.0	0.4	8.7	8.5	0.5	6.2	5.0	-2.9	8.5	0.6	3.1
2004	1.7	-1.4	-2.0	-3.0	5.1	3.3	-7.6	-2.5	3.3	5.0	6.0	3.0
2005	-6.3	-0.5	-1.8	-4.4	8.9	-3.3	7.6	-1.5	1.2	-1.5	6.1	-1.8
2006	3.9	-2.1	2.1	-0.2	-7.2	-0.1	-4.3	4.8	4.6	4.8	3.4	-1.9
2007	2.1	-1.7	0.5	5.6	3.2	0.5	-0.2	2.8	5.3	7.0	-6.8	-0.1
2008	-11.9	-4.8	1.9	8.0	5.9	-9.6	0.6	1.5	-15.6	-15.5	-11.5	2.3
2009	-2.3	-5.3	10.3	13.1	3.2	3.0	8.4	1.5	5.7	-3.1	6.4	5.2
2010	-6.5	4.6	7.7	2.2	-7.4	-6.0	7.3	-5.1	13.2	6.3	-0.2	4.8
2011	2.8	3.2	-0.5	2.9	-1.2	-2.0	1.7	-5.1	-4.5	10.4	-2.7	-0.6
2012	8.4	6.4	5.1	-1.2	-7.0	3.6	1.0	5.2	0.9	-5.3	1.3	-0.5
2013	2.7	0.3	3.0	2.5	3.6	-2.4	6.3	-0.1	4.8	5.0	3.6	2.9
2014	-1.9	5.2	-2.7	-0.3	4.5	3.1	1.2	5.0	-0.8	2.6	4.6	-2.2
2015	-2.1	7.2	-2.4	1.9	2.3	-2.5	4.6	-6.8	-2.2	11.4	0.6	-1.6
2016	-6.9	-1.6	6.9	-3.2	4.4	-2.3	7.2	1.1	2.2	-1.5	0.4	1.1
2017	5.1	4.4	2.0	2.7	3.9	-2.3	4.1	2.1	-0.3	4.6	2.0	0.6
2018	8.8	-1.3	-4.1	0.5	5.7	1.2	2.8	5.8	-0.3	-8.6	-0.3	-8.7
2019	9.0	3.0	3.9	5.5	-8.2	7.6	2.3	-1.9	0.9	4.4	4.1	3.9
2020	3.0	-6.1	-7.3	15.0	6.6	6.3	7.4	10.9	-5.8	-3.0	11.2	4.9
2021	0.3	-0.1	1.7	5.9	-1.2	6.3	2.9	4.2	-5.7	7.9	2.0	1.2
2022	-8.7	-4.5	4.7	-13.6	-1.6	-8.9	12.6	-5.1	-10.5	4.0	5.5	
Average	0.49	-1.39	0.85	2.48	1.07	-0.68	2.50	0.36	-1.78	3.59	3.01	0.08
Max	10.20	7.20	10.30	17.90	8.90	7.60	12.60	10.90	13.20	18.50	17.00	5.20
Minimum	-11.90	-26.20	-17.50	-13.60	-8.20	-13.10	-8.60	-12.30	-20.90	-15.50	-11.50	-12.10
Median	1.00	-0.90	1.80	2.35	3.20	0.20	2.85	1.30	-0.30	4.70	2.70	0.60
1 Std. Dev	6.02	7.26	5.89	7.62	5.44	5.31	5.68	5.23	7.74	7.90	6.11	4.27

Dow Jones

The **DIA** is less volatile with the best month since 1994 occurring this past October 2022 returning 14.0% while the worst month was a 15.23% decline. In 2022, there were three different months with 5%+ gains. In the past 22 years, the best month's average gain was November at +2.4% while the worst months average loss was down -1.2% in September.

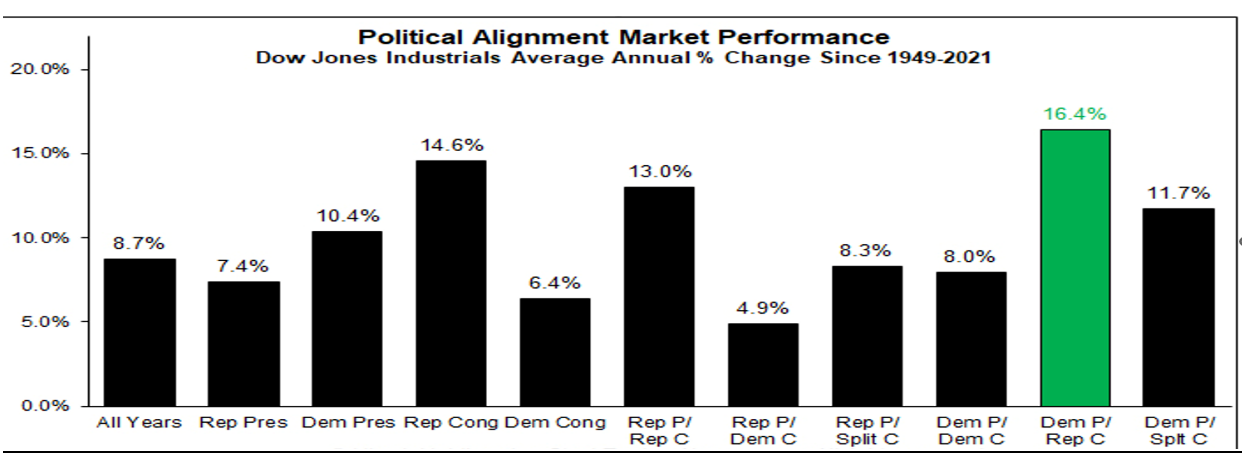
Small-Caps

The **Russell 2000 (IWM)** is somewhere in between the S&P and Nasdaq in terms of volatility with the best months averaging around 10.8% and its best month ever since 2000 returning 18.2% in November 2020. The worst month was a 21.5% decline in March 2020. In 2022, there were two months for the IWM that closed up or down by double-digits, surprisingly both being on the upside in October at +11.2% and July +10.6%. The largest down month in 2022 was -9.9% in April.

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2001	5.4	-6.7	-4.6	8.3	2.2	3.1	-5.6	-2.4	-14.6	6.5	7.6	5.5
2002	-0.2	-3.1	7.5	1.2	-4.7	-5.8	-13.4	-0.6	-8.0	4.1	8.5	-5.7
2003	-2.1	-3.0	0.2	10.3	10.9	1.2	6.5	4.8	-2.0	8.7	3.7	1.8
2004	4.3	1.0	1.0	-5.5	2.2	4.2	-6.8	-1.5	5.3	2.1	9.2	2.4
2005	-4.1	1.6	-2.8	-5.7	6.5	4.1	6.6	-2.0	0.1	-3.9	5.8	-0.7
2006	8.4	0.3	4.9	0.3	-5.7	0.0	-2.9	3.0	0.6	5.9	2.4	0.4
2007	1.7	-0.7	1.0	1.6	4.4	-1.4	-7.0	2.1	1.9	2.9	-6.9	-0.6
2008	-6.5	-2.9	-0.7	4.6	4.6	-7.5	3.7	3.6	-7.8	-21.0	-11.9	4.8
2009	-9.7	-12.0	7.8	15.4	3.4	1.8	9.2	2.9	5.6	-6.5	3.1	7.9
2010	-3.7	4.5	8.2	5.7	-7.5	-7.7	6.7	-7.4	12.5	4.2	3.5	8.0
2011	-0.4	5.5	2.5	2.6	-1.8	-2.4	-3.4	-8.9	-11.2	15.1	-0.4	0.5
2012	7.2	2.6	2.5	-1.6	-6.6	5.1	-1.5	3.5	3.3	-2.2	0.6	3.6
2013	6.2	1.0	4.7	-0.4	3.9	-0.8	7.3	-3.2	6.5	2.4	4.0	2.0
2014	-2.8	4.8	-0.8	-3.8	0.8	5.3	-6.1	4.8	-5.9	6.6	0.1	2.9
2015	-3.3	6.0	1.8	-2.6	2.2	0.8	-1.1	-6.3	-4.9	5.6	3.3	-5.0
2016	-8.6	-0.2	8.0	1.7	2.2	0.0	5.9	1.8	1.1	-4.6	11.1	2.9
2017	0.3	1.9	0.0	1.2	-2.0	3.4	0.9	-1.3	6.3	0.7	2.9	-0.4
2018	2.6	-3.8	1.2	1.0	6.2	0.6	1.7	4.3	-2.3	-11.0	1.7	-12.0
2019	11.3	5.2	-2.1	3.4	-7.9	7.0	0.7	-4.9	2.0	2.7	4.1	2.8
2020	-3.1	-8.9	-21.5	13.9	6.6	3.4	2.9	5.5	-3.3	2.2	18.2	8.7
2021	4.9	6.2	1.4	1.8	0.3	1.9	-3.6	2.2	-2.9	4.3	-4.3	2.3
2022	-9.5	1.0	1.2	-9.9	0.2	-8.4	10.6	-2.0	-9.7	11.2	2.2	-6.5
Average	-0.08	0.01	0.97	1.98	0.93	0.36	0.51	-0.09	-1.25	1.64	3.11	1.16
Max	11.30	6.20	8.20	15.40	10.90	7.00	10.60	5.50	12.50	15.10	18.20	8.70
Minimum	-9.70	-12.00	-21.50	-9.90	-7.90	-8.40	-13.40	-8.90	-14.60	-21.00	-11.90	-12.00
Median	-0.30	1.00	1.20	1.40	2.20	1.00	0.80	0.60	-0.95	2.80	3.20	2.15
1 Std. Dev	5.91	4.88	6.15	6.13	5.05	4.39	6.23	4.23	6.65	7.72	6.17	5.01

Pre-Presidential Election Year Seasonality

In 2023, we'll be in the third year of President Biden's elected term in office. It will also be split Congress as Republicans won back control of the House while Democrats hold control of the Senate. Political alignment market performance tends to see the best returns when there is gridlock and one of the best overall situations for the markets is the current one heading into 2023 as Dem's hold the White House while Congress is split. Since 1949, when there is a Democrat President with a split Congress the Dow Jones has returned +11.7% annually. One of the top scenarios only behind Democrat President/Republican Congress alignment.



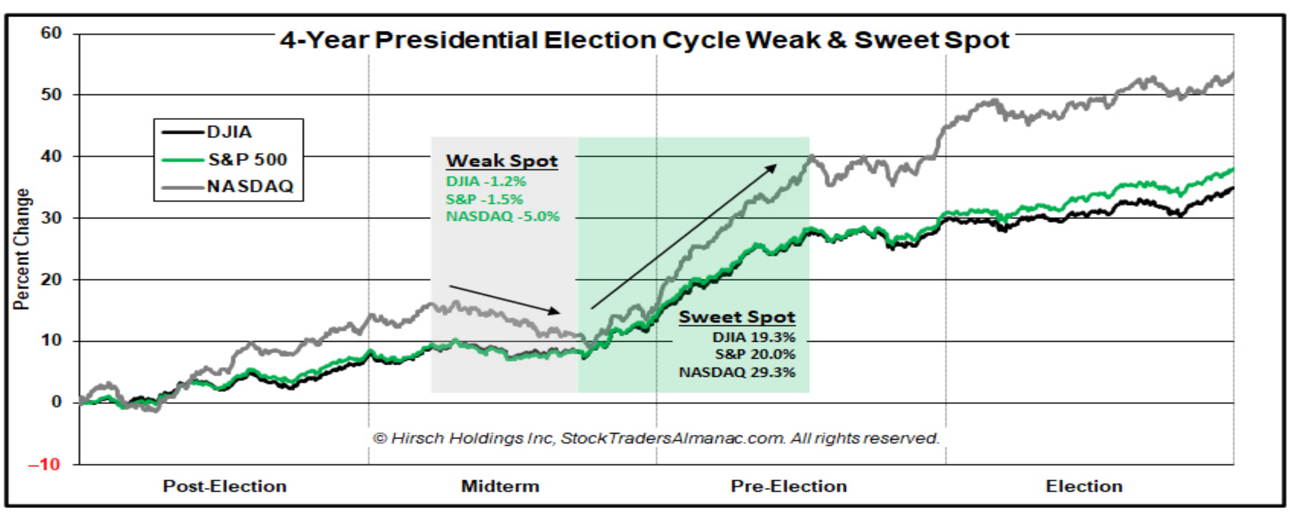
Pre-Election Year Seasonal Pattern

In 84 years of data there has only been one losing year during pre-election year for the markets. Since 1939, the only loss came in 2015 when the Dow finished the year off -2.2%. The only large loss in a pre-presidential election year going back 100 years came in 1931 during the Depression. Most bear markets have occurred in the first or second years after elections. This played out in 2022 as midterm election years are the weakest in the 4-year cycle (more below). Then going into pre-election year, the market improves as each President does whatever it takes to power up the economy and make sure voters are in a positive frame of mind. The past 15 pre-election years have shown solid returns as shown below with average gains of +16.6% for the S&P.

Year	President	S&P Return
2019	Trump	26.9%
2015	Obama	-0.7%
2011	Obama	-0.003%
2007	GW Bush	3.5%
2003	GW Bush	26.4%
1999	Clinton	19.5%
1995	Clinton	34.1%
1991	GHW Bush	26.3%
1987	Reagan	2.0%
1983	Reagan	17.3%
1979	Carter	12.3%
1975	Ford	31.5%
1971	Nixon	10.8%
1967	Johnson	20.1%
1963	Kennedy/Johnson	18.9%
	Average Return	**16.6%**
	Median Return	**18.9%**

4 Year Presidential Election Cycle Sweet Spot

The second and third quarter of midterm years have been the weakest period of the four-year Presidential pattern with the S&P averaging losses of -5%. In 2022, this pattern held true to its historical seasonality as the S&P had a weak August and September and bottomed in mid-October before rallying into early December. This sets up the best part of the cycle as Q4 of midterm year through Q2 of pre-election year is known as the sweet spot where the S&P has averaged a 20% gain while the Nasdaq jumps 29.3% in that 9-month span. Furthermore, from the midterm year lows to the pre-election year highs the Dow gains an average of 46.8% while the Nasdaq returns 68% on average since 1974. Impressive returns that seem hard to believe right now as we head into a new year with many questions about interest rates, inflation, geopolitical concern, corporate earnings, and overall investor and consumer confidence.

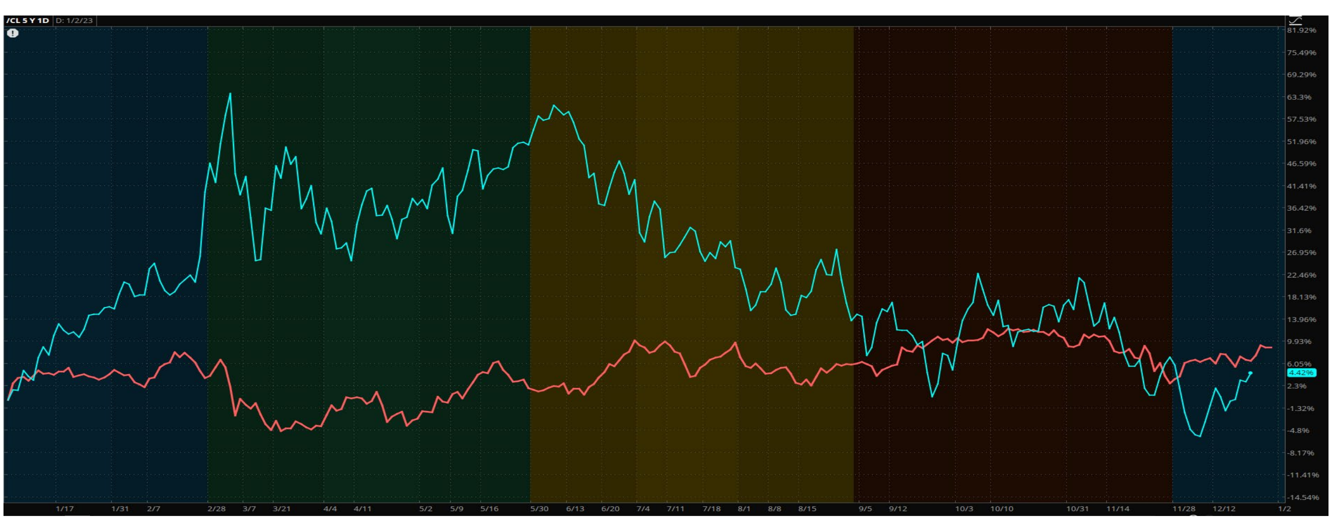


Other Notables

<u>Crude Oil</u>

Crude oil is impacted by seasonality due to the summer driving season in the US and rise in gasoline demand. This tends to occur in the Spring from April through June and can often start as early as March. Over the past five years, crude has peaked in Q2 sometime in late June and faded throughout the Summer and early Fall as the seasonality chart below shows the 5-year average in pink and 2022's performance in blue. The worst performing months are October and November while the best performing month on average is February.

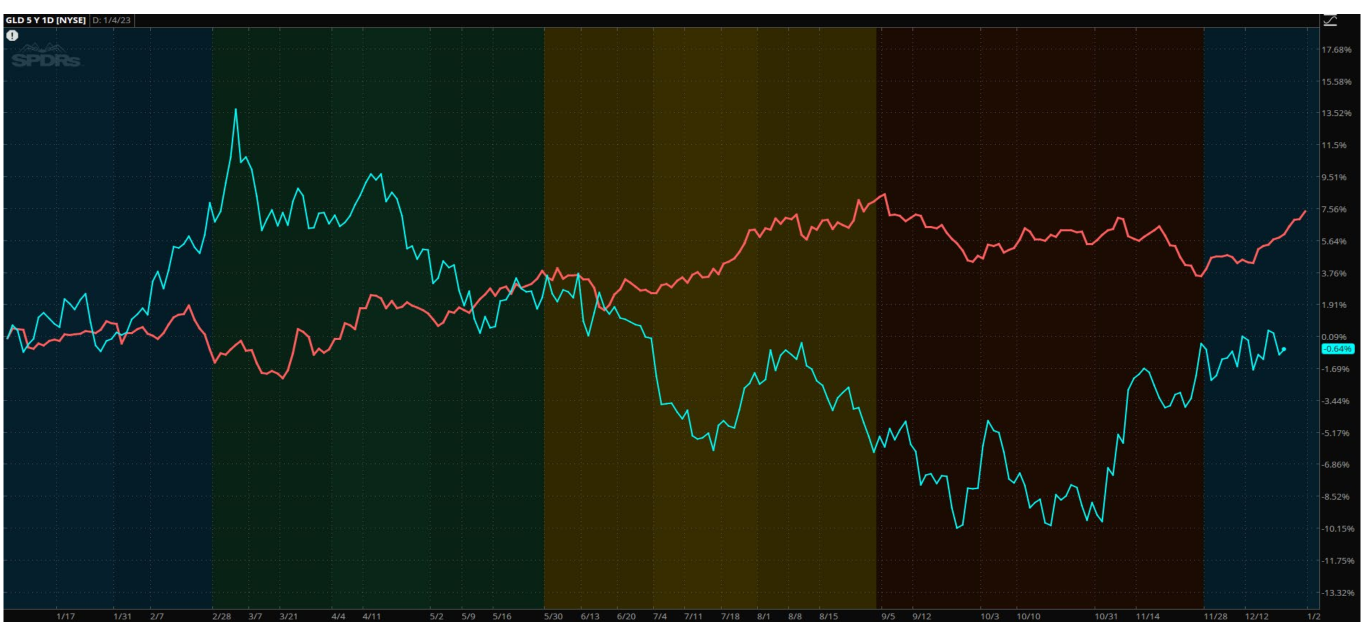
Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2001	6.9	-4.4	-4.0	8.3	-0.3	-7.5	0.4	3.2	-13.9	-9.6	-8.2	2.1
2002	-1.8	11.6	21.0	3.7	-7.3	6.1	0.6	7.3	5.1	-10.6	-1.2	16.0
2003	7.4	9.2	-15.2	-16.9	14.6	2.1	1.2	3.4	-7.5	-0.3	4.5	6.9
2004	1.6	9.4	-1.1	4.5	6.7	-7.1	18.2	-3.8	17.9	4.3	-5.1	-11.6
2005	10.9	7.4	7.1	-10.3	4.5	8.7	7.2	13.8	-3.9	-9.8	-4.1	6.5
2006	11.3	-9.6	8.5	7.9	-0.8	3.7	0.6	-5.6	-10.5	-6.6	7.5	-3.3
2007	-6.5	6.1	4.2	-4.0	-4.5	8.3	10.4	-4.7	12.1	17.1	-4.6	8.4
2008	-4.5	11.2	1.2	13.7	11.4	10.3	-12.0	-7.1	-11.7	-32.2	-24.3	-21.4
2009	-11.7	-7.4	7.4	-1.5	27.1	4.2	-3.0	-2.1	0.4	8.7	-0.4	0.3
2010	-9.3	8.9	3.8	2.6	-17.6	-0.2	4.1	-9.7	9.2	1.0	2.5	8.2
2011	-1.0	1.5	8.7	6.0	-10.3	-8.1	0.5	-7.8	-11.7	17.2	8.5	-1.7
2012	-0.8	8.2	-4.1	1.2	-17.8	-2.4	2.7	9.8	-4.9	-6.9	2.5	2.5
2013	5.7	-6.3	5.1	-4.6	-1.7	4.8	9.3	3.0	-4.2	-5.9	-3.6	5.6
2014	-1.5	5.6	-0.4	-0.7	3.7	3.2	-6.6	-1.5	-3.8	-11.0	-16.5	-20.4
2015	-12.5	1.6	-7.0	21.8	-1.0	-2.1	-21.6	1.9	-7.6	0.9	-12.7	-14.9
2016	-12.3	-6.7	7.8	16.5	5.0	-2.5	-15.6	6.2	5.5	-3.7	3.8	7.2
2017	-3.4	1.2	-7.1	-3.8	-2.7	-4.6	8.2	-6.3	8.3	4.8	4.9	4.7
2018	8.1	-4.7	5.8	5.4	-1.8	11.1	-5.2	3.0	5.5	-11.2	-22.2	-10.0
2019	17.5	5.3	4.6	6.3	-16.5	8.5	0.0	-4.8	-1.1	-0.4	2.8	10.2
2020	-15.4	-12.8	-55.5	-43.2	35.4	8.4	3.6	5.2	-7.5	-10.8	22.7	6.6
2021	6.6	17.4	-1.9	6.8	5.0	9.8	1.6	-5.2	9.4	8.7	-16.2	13.5
2022	14.9	8.0	9.8	4.1	10.8	-6.0	-2.9	-6.3	-10.7	9.6	-1.8	
Average	0.46	2.76	-0.06	1.08	1.90	2.21	0.08	-0.37	-1.16	-2.12	-2.78	0.73
Max	17.50	17.40	21.00	21.80	35.40	11.10	18.20	13.80	17.90	17.20	22.70	16.00
Minimum	-15.40	-12.80	-55.50	-43.20	-17.80	-8.10	-21.60	-9.70	-13.90	-32.20	-24.30	-21.40
Median	-0.90	5.45	4.00	3.90	-0.55	3.45	0.60	-1.80	-3.85	-2.05	-1.50	4.70
1 Std. Dev	9.43	8.09	14.50	13.03	13.07	6.39	8.81	6.38	9.00	11.16	10.87	10.64



Gold

Gold is also seasonal, although 2022 diverged from its typical stronger summer performance seen in the 5-year averages chart as gold peaked in Q1 and sold off into the early 3rd quarter largely due to historic strength in the US Dollar. The best months historically have been January and August, the former seeing strong inflows 7 of the past 9 years. The worst months have been October and March. September has closed lower in 6 straight and 9 of the last 10.

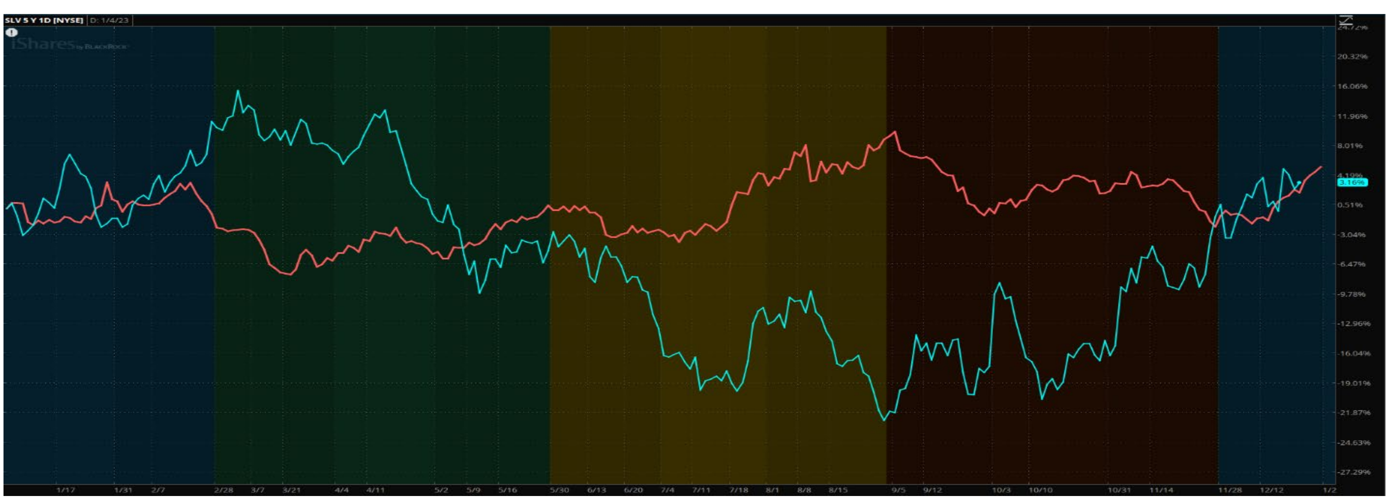
Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2001	-3.6	0.8	-3.4	2.1	1.7	1.2	-1.7	2.7	7.4	-4.9	-1.2	0.4
2002	2.1	5.3	1.5	2.3	6.0	-2.5	-4.4	2.7	3.5	-2.1	0.7	8.8
2003	5.9	-5.5	-3.6	0.6	7.3	-4.3	2.5	5.9	3.3	-0.5	3.1	4.5
2004	-4.0	-1.0	7.0	-8.3	1.2	0.7	-1.1	4.1	2.1	2.4	6.5	-3.9
2005	-3.6	3.1	-1.6	1.2	-3.9	4.3	-1.4	1.4	7.6	-0.6	5.8	5.1
2006	9.9	-1.1	3.6	12.0	-1.3	-4.7	3.2	-1.4	-4.5	1.3	6.9	-1.8
2007	2.6	2.6	-1.1	2.1	-2.3	-1.9	2.4	1.1	10.5	7.0	-1.7	6.7
2008	10.8	5.2	-6.0	-4.2	0.9	4.5	-1.4	-9.3	4.1	-16.1	12.6	7.7
2009	5.5	1.5	-2.5	-3.3	10.2	-5.2	2.4	0.1	5.8	3.7	12.8	-7.2
2010	-1.3	3.3	-0.4	5.9	3.1	2.4	-5.1	5.7	4.8	3.7	2.1	2.4
2011	-6.4	6.0	1.6	8.9	-1.8	-2.4	8.4	12.3	-11.1	5.9	1.7	-10.7
2012	11.4	-3.0	-1.3	-0.2	-6.3	2.4	0.8	4.9	4.7	-2.9	-0.5	-2.4
2013	-0.5	-5.1	1.0	-7.6	-6.2	-11.1	7.4	5.2	-4.8	-0.3	-5.5	-3.8
2014	3.4	6.3	-3.1	0.5	-3.1	6.3	-3.6	0.4	-6.2	-3.1	-0.5	1.3
2015	8.7	-5.9	-2.2	-0.2	0.6	-1.5	-6.6	3.7	-1.8	2.3	-6.8	-0.5
2016	5.4	10.9	-0.8	5.1	-6.1	9.0	2.0	-3.3	0.7	-2.9	-8.4	-1.9
2017	5.4	3.2	-0.4	1.7	-0.1	-2.2	2.3	4.2	-3.4	-0.8	0.4	2.1
2018	3.2	-2.1	0.6	-1.0	-1.2	-3.6	-2.2	-2.1	-0.7	2.1	0.3	4.9
2019	2.9	-0.6	-1.6	-0.7	1.8	8.0	0.0	7.9	-3.4	2.6	-3.2	3.7
2020	4.5	-0.6	-0.2	7.3	2.6	2.7	10.8	-0.3	-4.2	-0.5	-5.4	7.0
2021	-3.2	-6.3	-1.1	3.6	7.7	-7.2	2.5	-0.1	-3.2	1.5	-0.7	3.3
2022	-1.7	6.1	1.3	-2.1	-3.3	-1.6	-2.6	-2.9	-2.9	-1.8	8.5	
Average	2.61	1.05	-0.58	1.17	0.34	-0.30	0.66	1.95	0.38	-0.18	1.25	1.22
Max	11.40	10.90	7.00	12.00	10.20	9.00	10.80	12.30	10.50	7.00	12.80	8.80
Minimum	-6.40	-6.30	-6.00	-8.30	-6.30	-11.10	-6.60	-9.30	-11.10	-16.10	-8.40	-10.70
Median	3.05	1.15	-0.95	0.90	0.25	-1.55	0.40	2.05	0.00	-0.40	0.35	2.10
1 Std. Dev	5.13	4.63	2.71	4.88	4.57	4.99	4.35	4.51	5.40	4.66	5.75	5.07



Silver

Silver follows some similar seasonal patterns as gold with strength in January and February and weakness in March. July has also been a standout month for Silver. Its lows are a little less deep while some of its biggest months have been much larger than gold. Since 2007, gold's best month was +12.8% while during that same period silver has had 22 months at or greater than 12.8% including this year in November 2022 being up +15.9% and snapping a losing streak for November that went back 9 straight years to 2013. The worst months have been June and September. Since 2001, the average monthly return is 1.0%.

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2001	4.1	-6.5	-4.0	0.9	1.4	-2.1	-1.6	-0.9	10.5	-9.1	-1.2	10.8
2002	-8.2	6.4	2.9	-2.2	10.4	-3.6	-4.8	-3.0	1.6	-0.4	-1.6	7.4
2003	1.5	-5.0	-2.8	4.0	-2.6	0.7	12.7	-0.8	0.4	-1.4	5.9	11.0
2004	4.9	7.4	18.4	-23.7	2.2	-5.5	12.2	3.2	2.1	5.7	5.8	-11.7
2005	-1.0	8.8	-2.3	-3.5	7.3	-4.7	2.6	-5.5	9.2	1.1	9.4	6.9
2006	11.3	-0.5	17.7	19.3	-8.6	-12.2	3.0	13.8	-11.3	7.3	13.8	-7.7
2007	5.1	4.5	-5.5	-0.1	0.4	-7.7	3.7	-6.3	13.8	5.2	-3.2	5.7
2008	14.4	17.0	-13.4	-1.9	-0.3	3.5	1.6	-23.7	-11.4	-19.2	6.8	9.5
2009	11.8	2.9	-0.7	-4.5	26.7	-13.5	2.4	6.7	12.0	-1.9	12.9	-8.9
2010	-3.9	1.1	6.7	6.5	-1.3	1.0	-3.5	7.7	12.6	13.4	13.5	10.0
2011	-9.2	20.9	11.1	27.5	-19.8	-10.0	14.8	4.1	-28.5	15.7	-4.3	-15.8
2012	19.8	3.9	-6.5	-4.1	-10.5	-1.2	1.8	13.5	8.7	-6.6	3.5	-9.2
2013	3.6	-9.5	-0.4	-14.4	-8.6	-11.5	0.9	18.1	-7.5	1.0	-8.8	-2.8
2014	-1.4	10.3	-6.4	-3.1	-2.1	12.0	-3.3	-4.4	-12.6	-5.2	-4.3	1.6
2015	9.8	-4.1	0.4	-3.1	3.6	-6.0	-6.3	-0.6	-0.9	6.7	-9.2	-1.9
2016	3.0	4.5	3.4	15.7	-10.5	17.6	8.3	-8.4	2.7	-6.8	-7.7	-3.5
2017	10.1	4.5	-0.7	-5.5	0.6	-4.2	1.2	4.7	-5.5	0.3	-1.8	3.1
2018	2.3	-5.4	-0.3	-0.2	0.5	-2.0	-3.6	-6.6	0.6	-2.3	-0.7	9.0
2019	3.7	-2.8	-3.1	-1.1	-2.6	5.0	6.1	12.8	-7.2	6.3	-5.9	4.8
2020	0.8	-7.7	-16.0	7.1	19.2	2.1	33.2	15.8	-17.5	1.6	-4.3	16.7
2021	1.7	-1.3	-8.0	5.8	7.9	-6.5	-2.4	-6.3	-7.3	7.7	-4.7	2.1
2022	-3.3	8.8	1.1	-8.0	-5.7	-6.0	0.3	-11.3	5.5	0.7	15.9	
Average	3.68	2.65	-0.38	0.52	0.35	-2.49	3.60	1.03	-1.36	0.90	1.35	1.77
Max	19.80	20.90	18.40	27.50	26.70	17.60	33.20	18.10	13.80	15.70	15.90	16.70
Minimum	-9.20	-9.50	-16.00	-23.70	-19.80	-13.50	-6.30	-23.70	-28.50	-19.20	-9.20	-15.80
Median	3.30	3.40	-0.70	-1.50	0.05	-3.90	1.70	-0.70	0.50	0.85	-1.40	3.10
1 Std. Dev	7.11	7.83	8.43	10.81	10.09	7.53	8.73	10.21	10.90	7.71	7.92	8.75



Bonds

Bonds show strong seasonal trends as well with the summer months best performing. Over the last five years, bonds have climbed steadily from early May before peaking in August. The Fall has tracked lower every year since 2009. The best months are July, August, and May. The worst month is October, lower 6 of the last 7 years. 2022 was a historically weak year for bonds with just two months showing positive returns, July and November. The weakest month of 2022 was April at -9.4%.

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2001	0.3	1.8	-0.6	-2.6	0.2	0.8	3.6	2.0	0.9	5.1	-5.1	-1.8
2002	1.2	1.2	-3.9	3.7	0.4	1.8	2.9	4.3	4.0	-2.8	-1.0	4.1
2003	-0.6	3.1	-1.4	1.1	6.3	-1.8	-10.0	1.3	5.9	-3.0	0.3	1.4
2004	1.9	2.3	1.4	-6.2	-0.3	1.1	1.5	4.2	1.0	1.8	-2.4	2.7
2005	3.6	-1.5	-0.5	3.9	3.1	2.2	-3.4	3.5	-3.6	-2.2	0.7	3.0
2006	-1.3	1.1	-4.6	-2.8	-0.2	1.2	2.2	3.1	1.9	0.9	2.3	-2.7
2007	-1.0	3.4	-1.7	0.9	-2.3	-1.0	3.3	1.8	0.2	1.8	5.4	-0.6
2008	2.1	-0.5	2.1	-2.5	-2.7	2.7	-0.4	2.7	1.5	-1.9	14.3	13.6
2009	-13.1	-1.5	4.0	-7.0	-3.7	0.8	0.6	2.2	2.5	-2.6	1.2	-6.3
2010	2.7	-0.3	-2.1	3.3	5.1	5.8	-1.0	8.4	-2.5	-4.5	-1.7	-3.7
2011	-3.1	1.7	0.0	2.3	3.4	-2.3	4.4	9.7	13.2	-3.8	2.0	3.4
2012	-0.3	-2.6	-4.2	4.8	9.0	-1.7	3.8	-1.3	-2.5	-0.5	1.4	-2.5
2013	-3.2	1.2	-0.4	4.7	-6.8	-3.3	-2.3	-1.3	0.7	1.4	-2.7	-1.9
2014	6.3	0.5	0.7	2.1	3.0	-0.3	0.7	4.7	-2.1	2.8	3.0	3.3
2015	9.8	-6.1	1.1	-3.4	-2.4	-4.1	4.6	-0.7	2.0	-0.4	-0.9	-0.3
2016	5.6	3.1	-0.1	-0.7	0.8	6.9	2.1	-1.0	-1.5	-4.4	-8.2	-0.5
2017	0.8	1.6	-0.7	1.6	1.9	0.8	-0.7	3.4	-2.3	0.0	0.7	1.8
2018	-3.3	-3.0	2.9	-2.1	2.0	0.7	-1.4	1.3	-2.9	-2.9	1.8	5.9
2019	0.4	-1.4	5.6	-2.0	6.8	1.0	0.3	11.0	-2.7	-1.1	-0.4	-3.2
2020	7.7	6.6	6.4	1.2	-1.8	0.3	4.4	-5.1	0.8	-3.4	1.7	-1.2
2021	-3.6	-5.7	-5.2	2.5	0.0	4.4	3.7	-0.3	-2.9	2.5	2.8	-2.0
2022	-3.9	-1.6	-5.4	-9.4	-2.3	-1.3	2.4	-4.6	-8.2	-6.0	7.2	
Average	0.41	0.15	-0.30	-0.30	0.89	0.67	0.97	2.24	0.15	-1.05	1.02	0.60
Max	9.80	6.60	6.40	4.80	9.00	6.90	4.60	11.00	13.20	5.10	14.30	13.60
Minimum	-13.10	-6.10	-5.40	-9.40	-6.80	-4.10	-10.00	-5.10	-8.20	-6.00	-8.20	-6.30
Median	0.35	0.80	-0.45	1.00	0.30	0.80	1.80	2.10	0.45	-1.50	0.95	-0.50
1 Std. Dev	4.82	2.98	3.26	3.92	3.79	2.71	3.37	4.03	4.21	2.83	4.42	4.26

Sector Analysis

Let's look at some individual sectors now and how they've fared against the S&P, so we can focus on the right sectors that makes optimal use of seasonally strong periods.

Consumer Discretionary (XLY) – In 2022, the best month for XLY was July as it rose 18.4%. Historically, the past 5 years the strongest months for the XLY are April and July with January through April the strongest grouping. The weakest months are February and December. Over the last five years, the XLY has outperformed the SPX most often in April, July, and September. This is the XLY vs SPY.

5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLY	2.1	-2.9	-1.0	4.2	-1.5	1.4	6.0	2.2	-2.1	0.1	3.4	-3.1
Diff	0.6	-1.2	0.0	1.4	-1.8	0.7	1.4	0.7	0.9	-1.5	-0.8	-2.4

Staples (XLP) – In 2022, the best month for XLP was October as it rose 9.0%. The strongest months for the XLP are October, November, and July. The weakest month is February. Over the last five years, the XLP has outperformed the SPX most often in March and December with the latter being more than 2.5% better in relative outperformance. This is the XLP vs the SPY.

5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLP	0.1	-3.3	1.5	2.0	-1.2	1.3	3.7	1.3	-2.2	2.2	3.2	0.8
Diff	-1.4	-1.6	2.5	-0.8	-1.5	0.6	-0.9	-0.2	0.8	0.6	-1.0	1.5

Energy (XLE) – In 2022, the best month for XLE was October, up over 25%, while the worst month was June down over 17%. The strongest months for the XLE are January and April with Spring the strongest three-month grouping and aligning with crude's seasonality. The weakest months are March and August. Over the last five years, the XLE has outperformed the SPX most often in January and April.

5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLE	5.3	1.1	-3.6	7.8	3.1	-0.8	-0.7	-2.4	-1.8	3.6	4.9	-0.3
Diff	3.8	2.8	-2.6	5.0	2.8	-1.5	-5.3	-3.9	1.2	2.0	0.7	0.4

Healthcare (XLV) – In 2022, the XLV outperformed the SPX in 8 of 12 months with strength from February through June. The best months were March and October, up 5.7% and 9.6% respectively and beating the overall market. The strongest months for the XLV are July and November. The weakest month is February. Over the last five years, the XLV has outperformed the SPX most often in December, March, and September. It was weakest in July and August

5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLV	0.6	-2.6	0.7	2.0	0.9	1.1	3.7	0.6	-1.5	1.9	4.5	1.0
Diff	-0.9	-0.9	1.7	-0.8	0.6	0.4	-0.9	-0.9	1.5	0.3	0.3	1.7

Materials (XLB) – In 2022, the best months for XLB were October and November, the latter up 11.7%. The worst month was June, down -14% and which underperformed the SPX by 5.6%. The strongest months for the XLB are April and November with October through December the strongest multi-month grouping. The weakest months are February and September. Over the last five years, the XLB has outperformed the SPX most often in April, May, and November.

5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLB	-1.2	-1.6	-0.6	4.1	1.4	-1.0	3.6	-0.2	-2.7	1.3	6.1	0.3
Diff	-2.7	0.1	0.4	1.3	1.1	-1.7	-1.0	-1.7	0.3	-0.3	1.9	1.0

Industrials (XLI) – In 2022, the best months for XLI were October, November, and July where it outperformed the SPX in all three. The weakest month was May, down -4%. The strongest months for the XLI are November and July with October through December the strongest multi-month grouping. The weakest months are June and March. Over the last five years, the XLI has outperformed the SPX most often in February and November.

5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLI	1.5	-0.3	-2.0	1.2	0.7	-0.6	4.6	0.9	-2.4	1.9	5.7	-1.4
Diff	0.0	1.4	-1.0	-1.6	0.4	-1.3	0.0	-0.6	0.6	0.3	1.5	-0.7

Financials (XLF) – In 2022, the best months for the XLF were July and October. It outperformed the SPX in 8 of the 12 months including each of the last 5 months. The strongest months for the XLF are April, July, and November with the Fall period the strongest three-month grouping. The weakest months are March, June, and September. Over the last five years, the XLF has outperformed the SPX most often in February and October. The XLF tends to be a benefactor of higher interest rates and the trend up in 2022 created a few long streaks of upside for banks.

5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLF	2.2	-0.3	-4.4	2.9	0.4	-1.9	3.6	0.8	-2.1	3.2	5.1	-1.0
Diff	0.7	1.4	-3.4	0.1	0.1	-2.6	-1.0	-0.7	0.9	1.6	0.9	-0.3

Biotech (XBI) – In 2022, the best months for the XBI were June, July, and October. It outperformed the SPX 4 months in a row from June through September. The worst month was April, down 18% while the worst month relative to the SPX was January with a spread of -11.3%. The strongest months for the XBI are June and November. The strongest stretch of months is mid-year from June through August. The weakest months are March and September. Over the last five years, the XBI has outperformed the SPX most in June by a nearing 6% and is the month with the strongest outperformance.

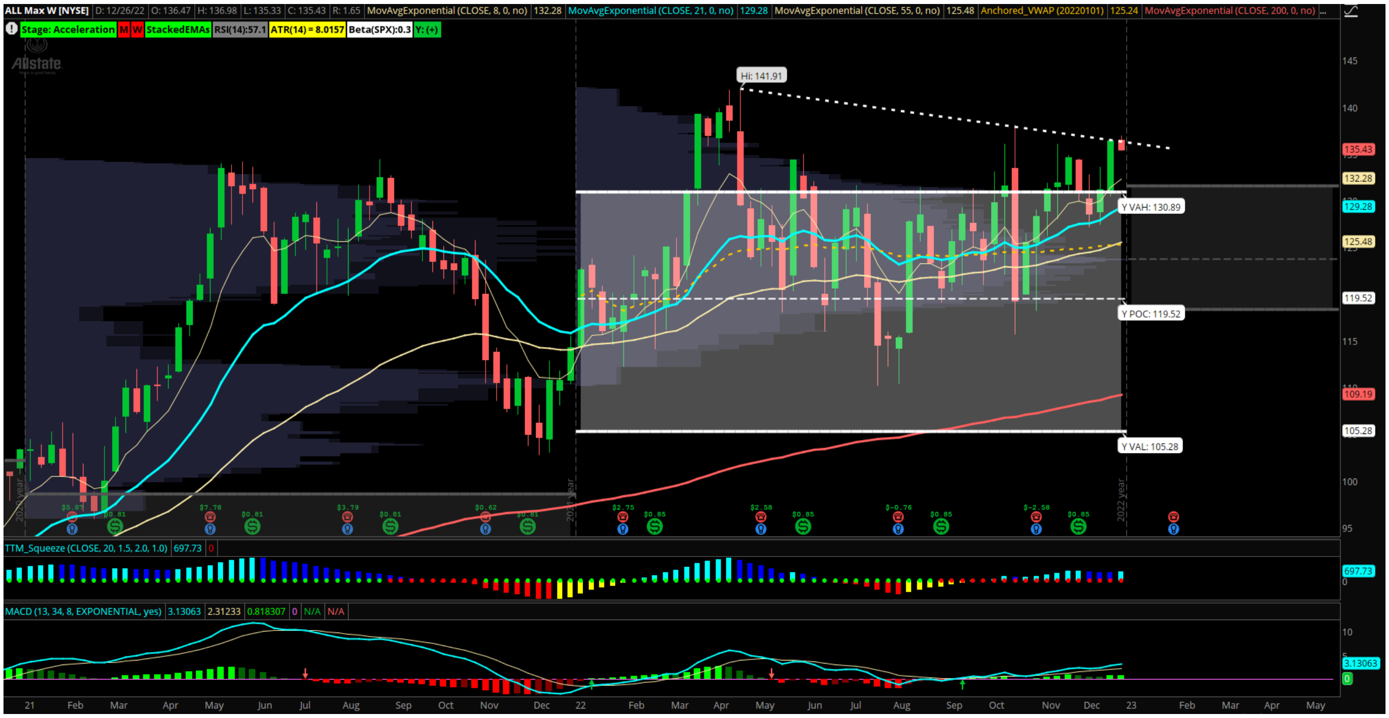
5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XBI	2.5	-0.7	-4.5	-0.7	0.0	6.6	-0.8	2.4	-4.0	-1.3	6.2	-2.9
Diff	1.0	1.0	-3.5	-3.5	-0.3	5.9	-5.4	0.9	-1.0	-2.9	2.0	-2.2

Utilities (XLU) – In 2022, XLU was strongest in March and November. The strongest months for the XLU are March, July, and October. The group performs best from October through January. The worst month for shares is February. The last 5 years best performance against the SPX is March and December. The worst month relative to the SPX is November.

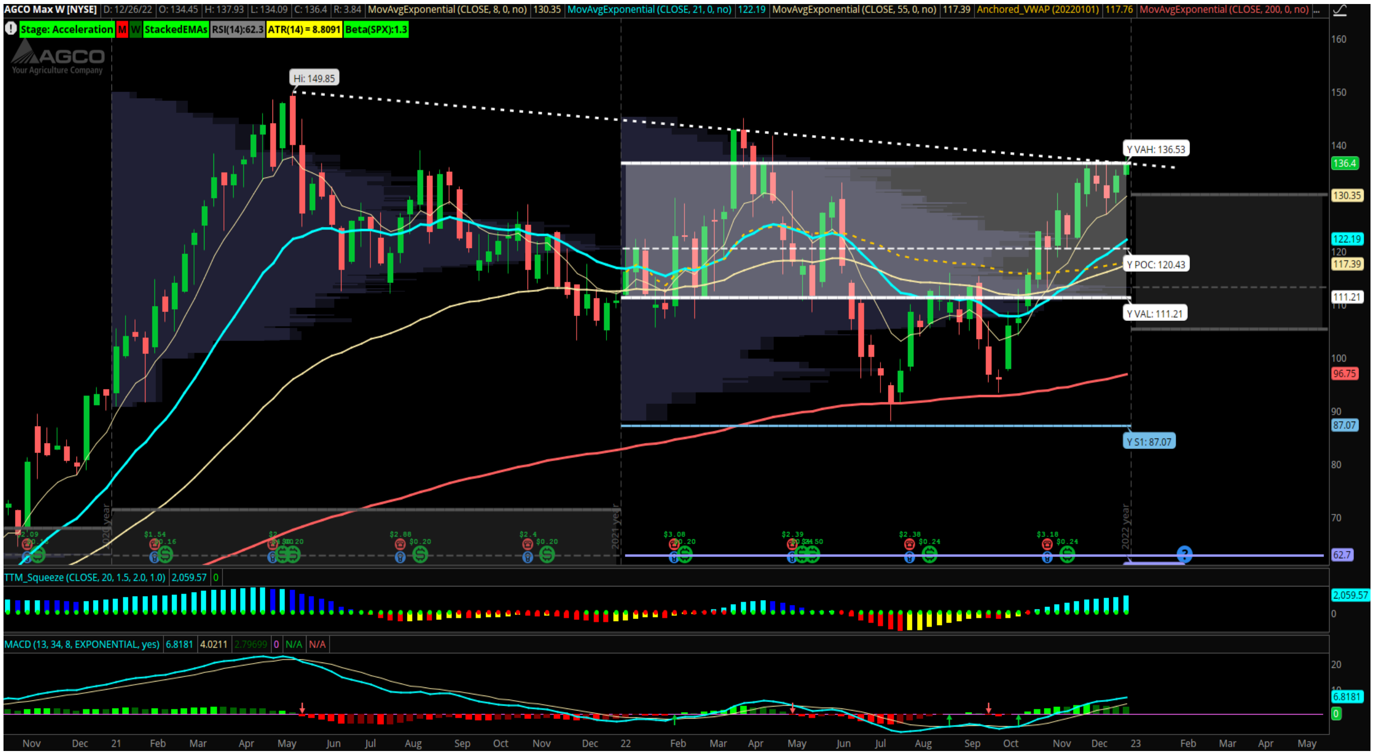
5-Year Returns	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
S&P	1.5	-1.7	-1.0	2.8	0.3	0.7	4.6	1.5	-3.0	1.6	4.2	-0.7
XLU	0.6	-3.5	3.5	1.2	0.9	-1.2	3.8	1.6	-2.5	2.6	1.5	2.1
Diff	-0.9	-1.8	4.5	-1.6	0.6	-1.9	-0.8	0.1	0.5	1.0	-2.7	2.8

Technical Momentum into 2023 with Consolidation Patterns Near Breakouts or Freshly Breaking Out

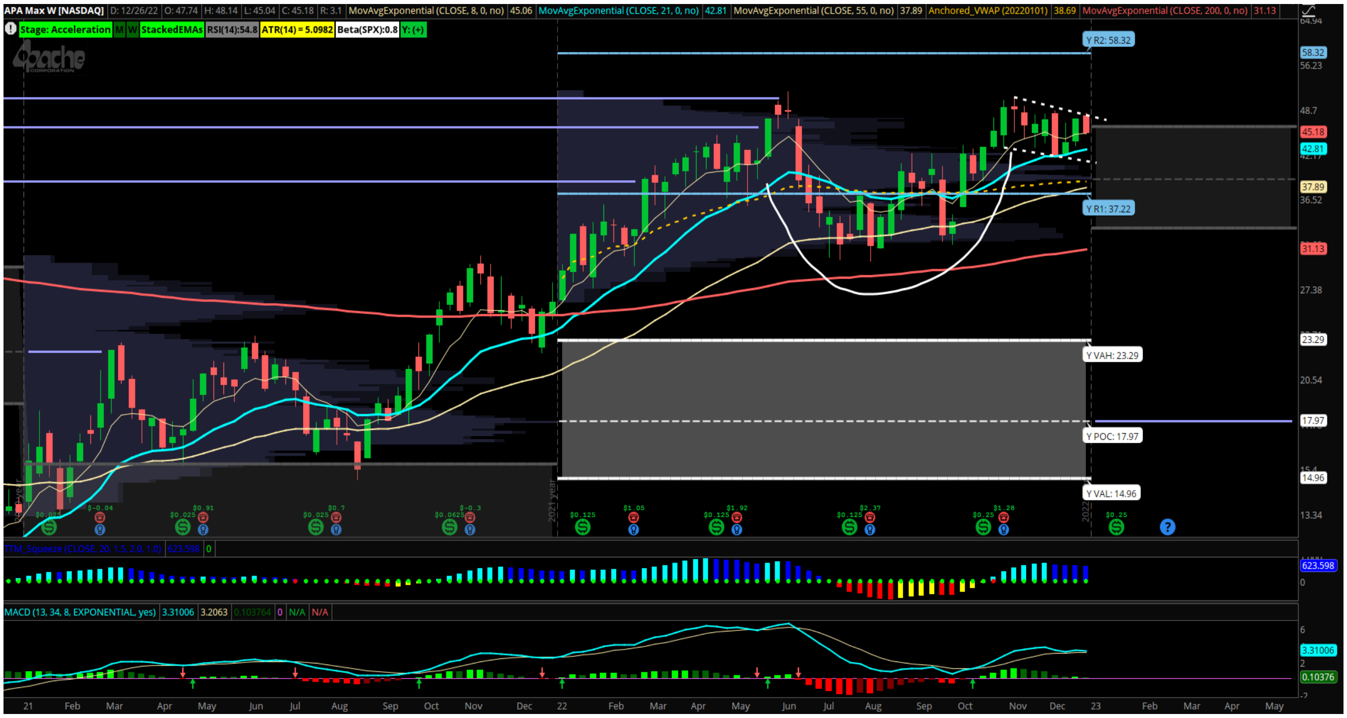
Allstate (ALL) closing 2022 on a strong note and above yearly value area with a tight coiled weekly chart poised to make all time new highs above 142. ALL has an optimal buy point on a pullback to the 8 week EMA near 132.25.



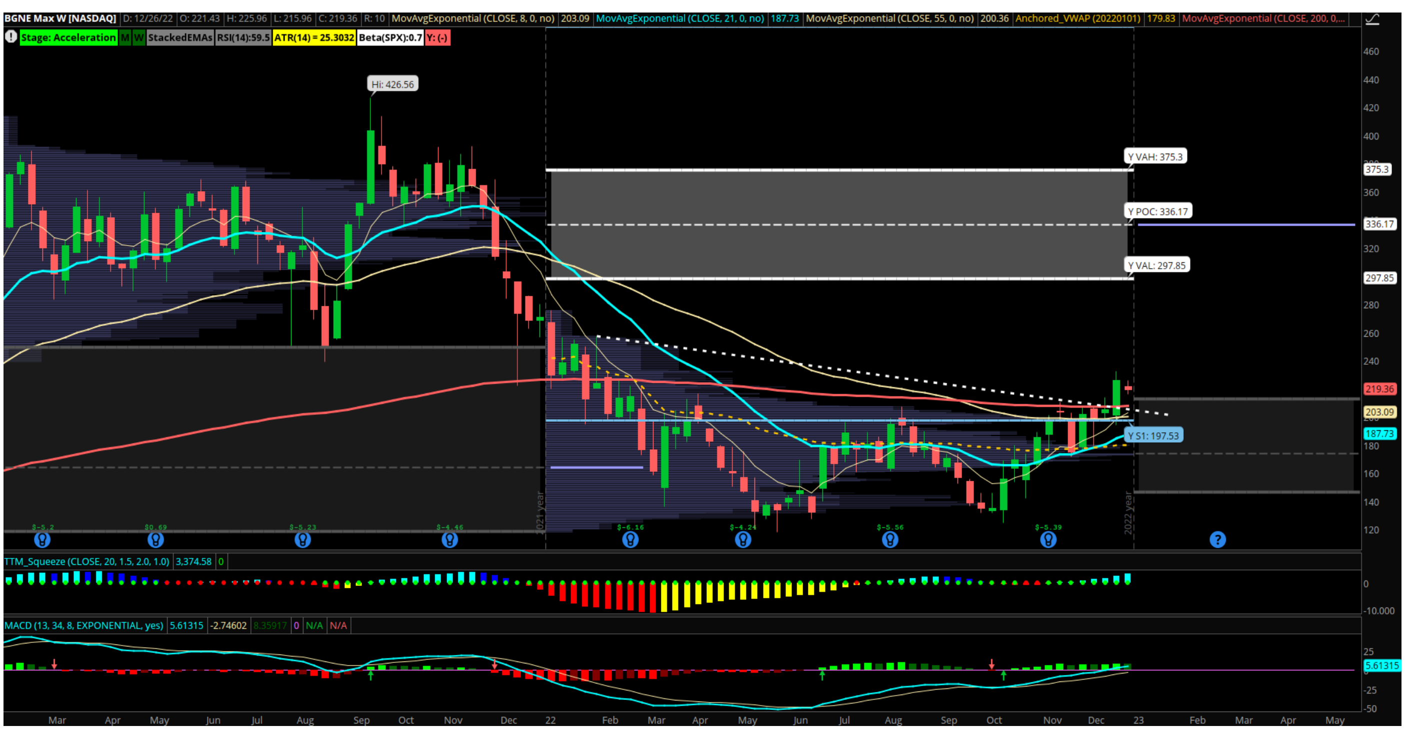
AGCO Corp (AGCO) shares are trying to break out above 2021 yearly value area at 136.50 and a close above can likely see 150+ in early 2023 as this weekly chart MACD points higher and the trend riding the 8-week EMA. A dip back to 130 would be an ideal level to get long.



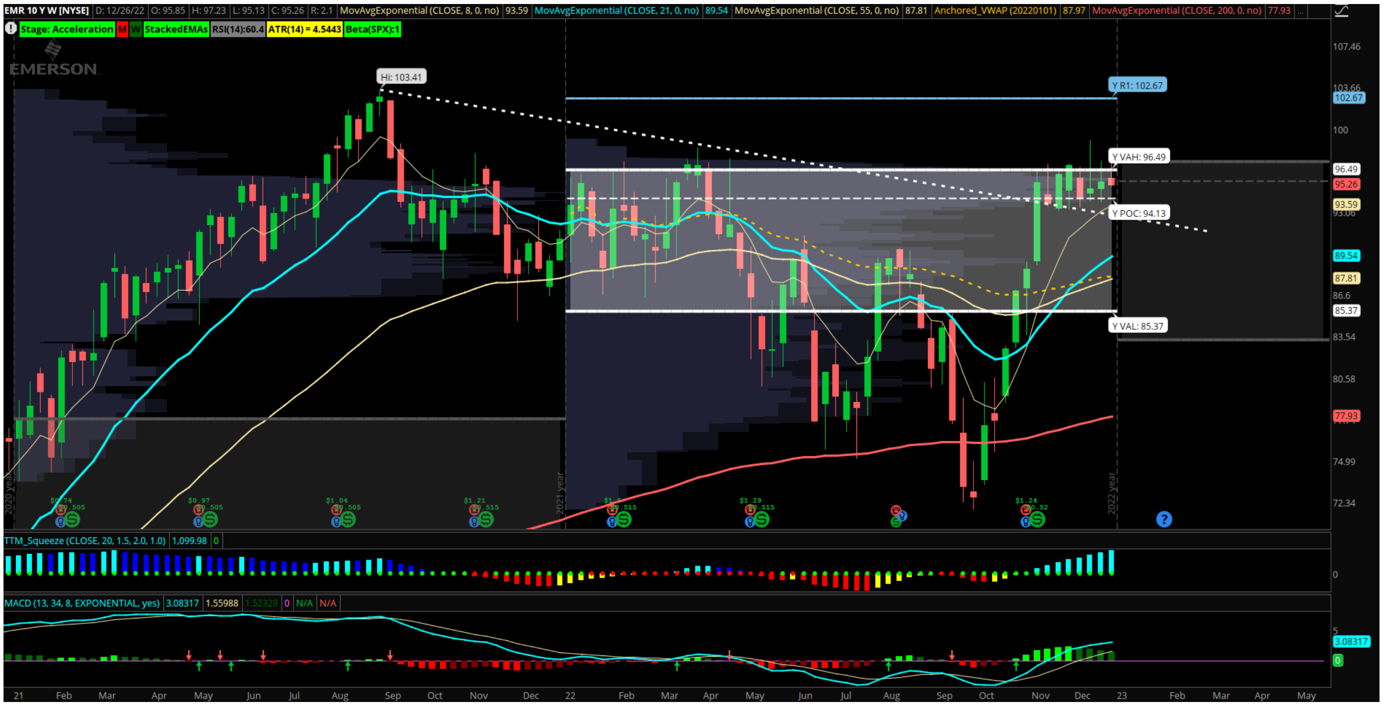
Apache (APA) shares forming a weekly cup and handle pattern near the highs of this year and a classic breakout above 48 would signal a move to new highs into the 60 level at least into first half of 2023. A relative strength energy stock with a lot of dip buyers as oil pulled back.



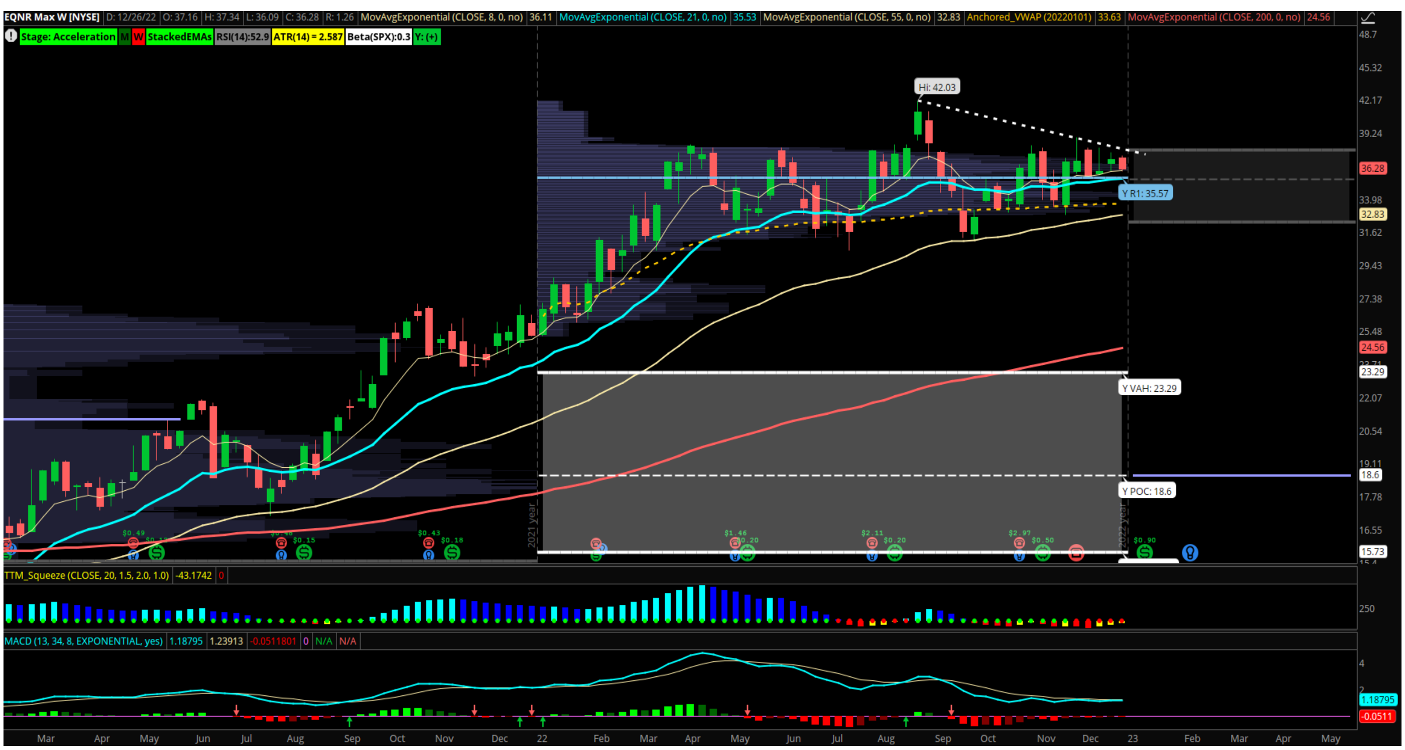
BeiGene (BGNE) formed a double bottom basing pattern on the weekly chart and now back above all key weekly moving averages as price clears a one-year trendline. A hold above 200 can likely target a larger move to 275-300 in the next year.



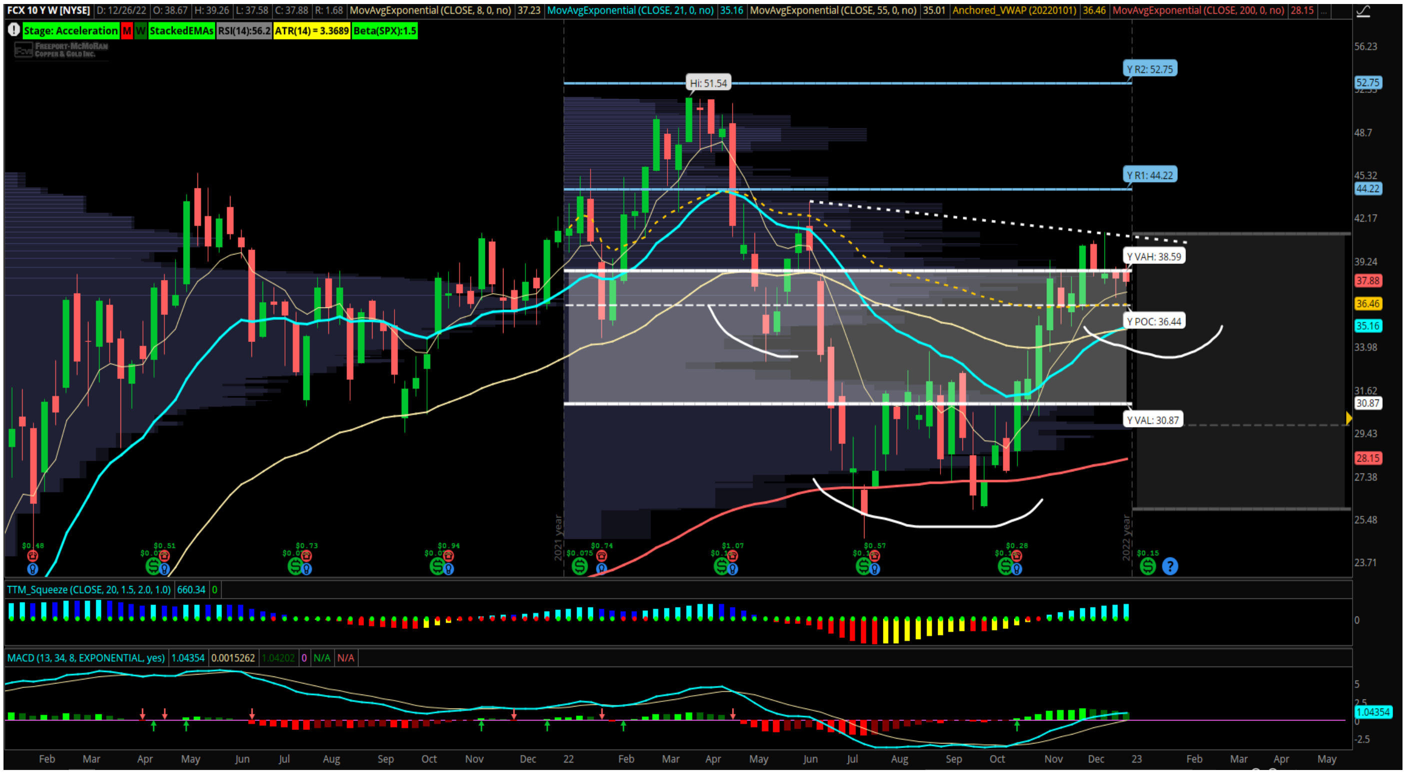
Emerson (EMR) shares of the industrial are nearing a breakout of yearly value area above 96.50 as a large weekly bull flag develops from its recent surge off lows and strong Q4 performance in 2022. EMR has its 1.272 fib extension target higher at 112 if *this* range can breakout into 2023.



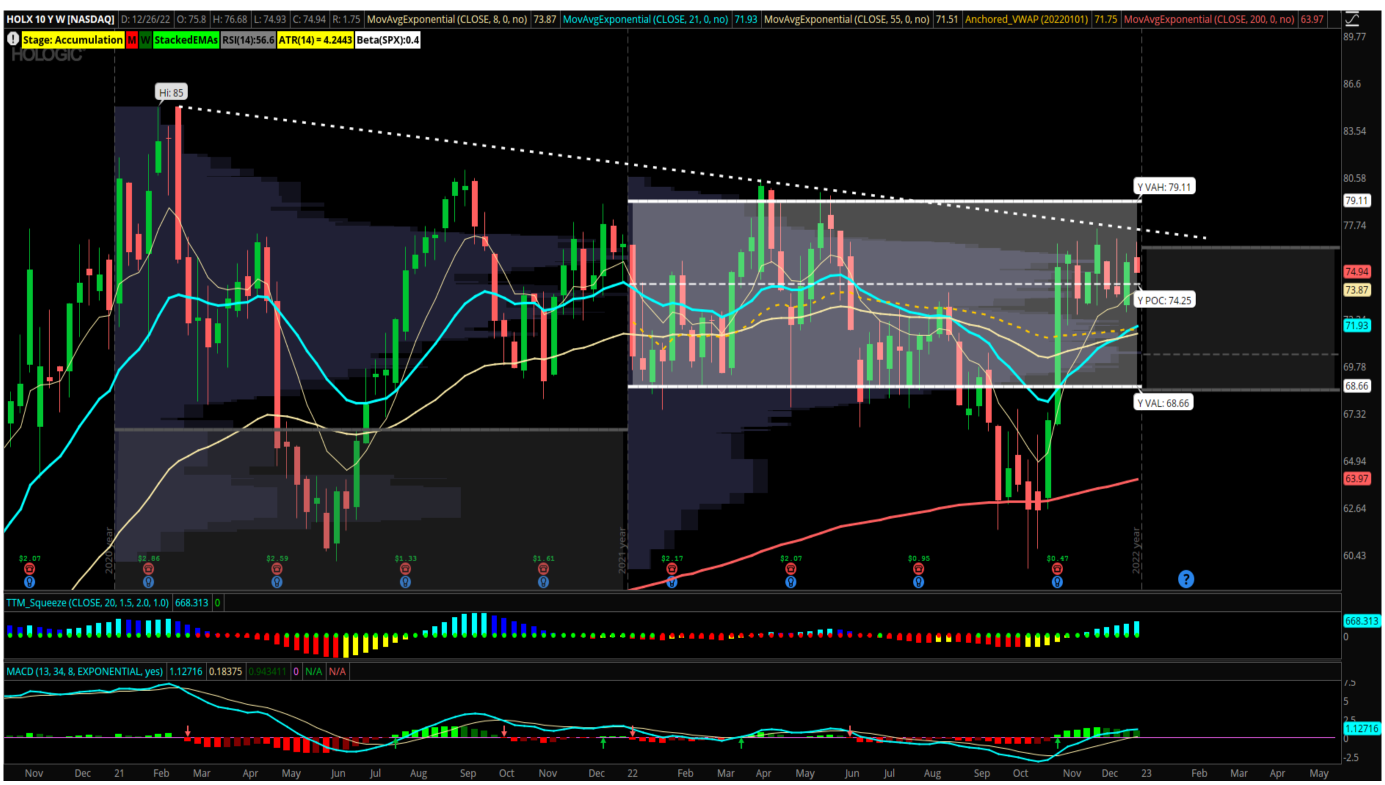
Equinor (EQNR) shares forming a weekly bull pennant above its key moving averages and a tight Bollinger band squeeze setting up with MACD nearing a weekly bull cross. A breakout through the 38 level can likely target its 1.272 fib extension at 45.



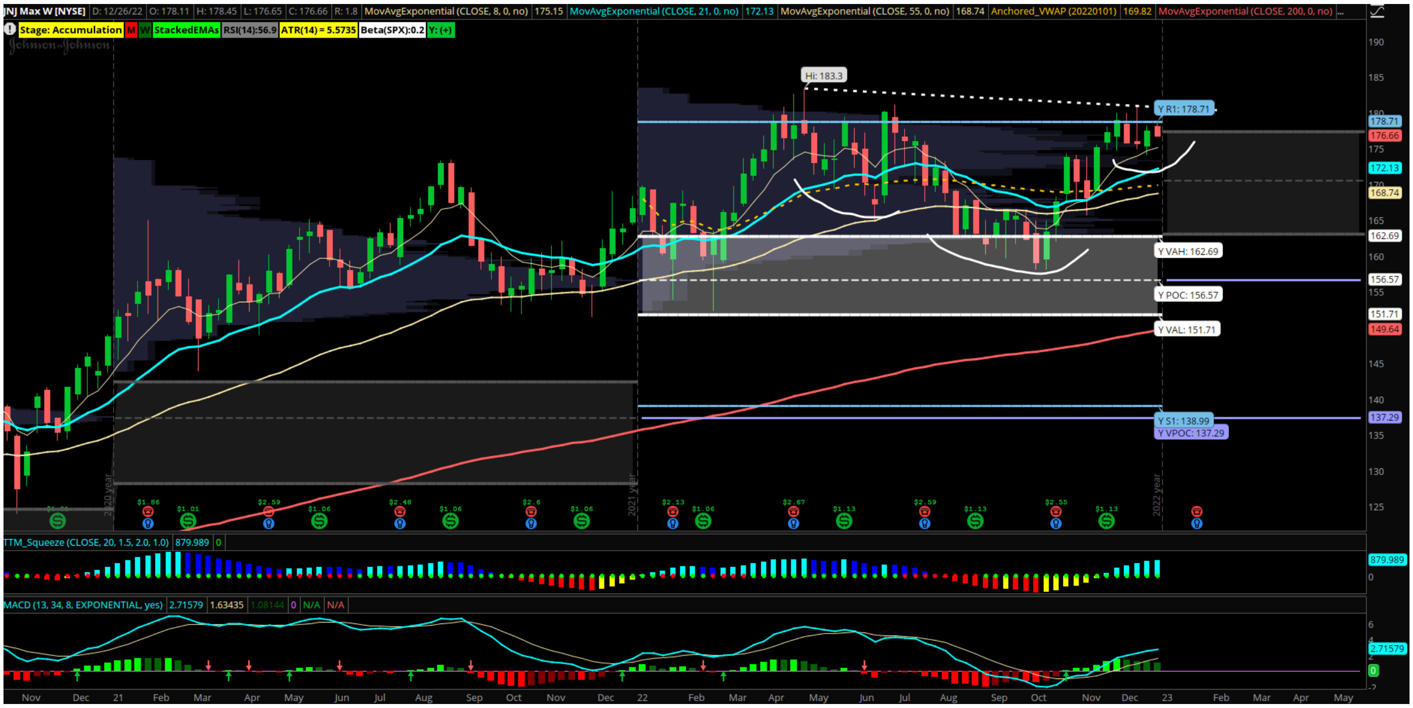
Freeport (FCX) some resistance above still but a metals name that should benefit if gold and copper continue to trend higher from their 2022 base patterns. FCX has a sloppy inverted head and shoulders pattern with a breakout trigger at 41 that likely can target 51 as the prior highs.



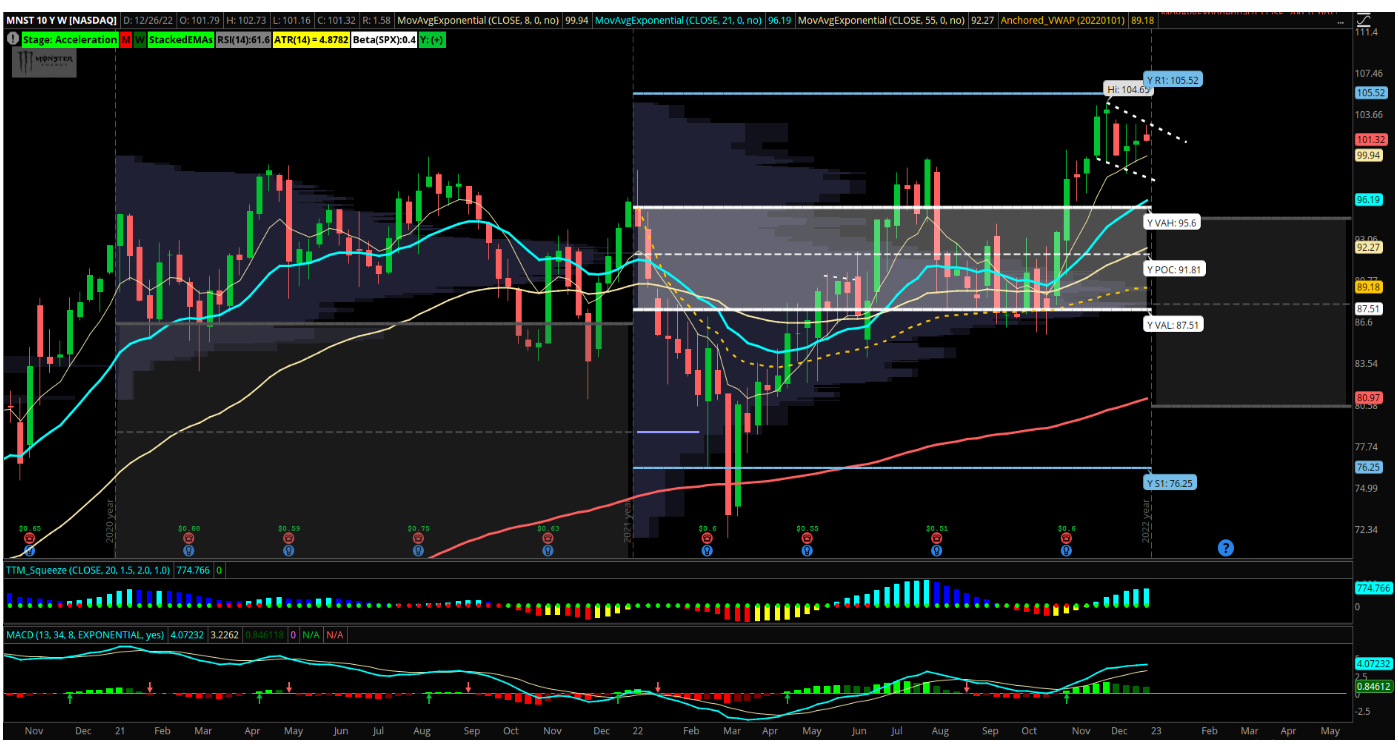
Hologic (HOLX) shares are inside yearly value area with a bull flag forming on the weekly chart. Potential breakout trigger above 76 with 80 being the first target then 85 prior all-time highs.



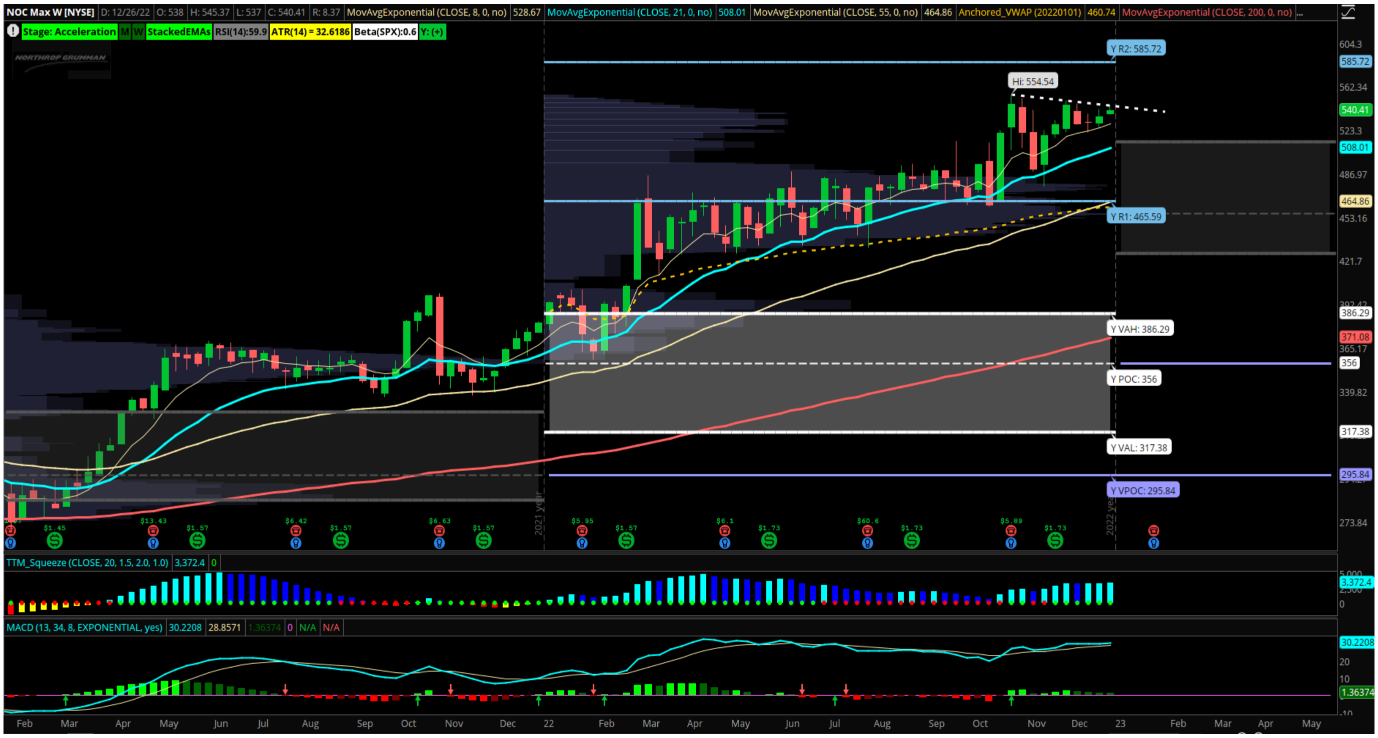
J&J (JNJ) a defensive healthcare name that outperformed in 2022 and looks to start 2023 on a move to fresh highs out of this inverted head and shoulders bull pattern. A breakout above 180 like moves towards 190 as the 1.272 fib extension and then the round number 200 a likely target later in 2023.



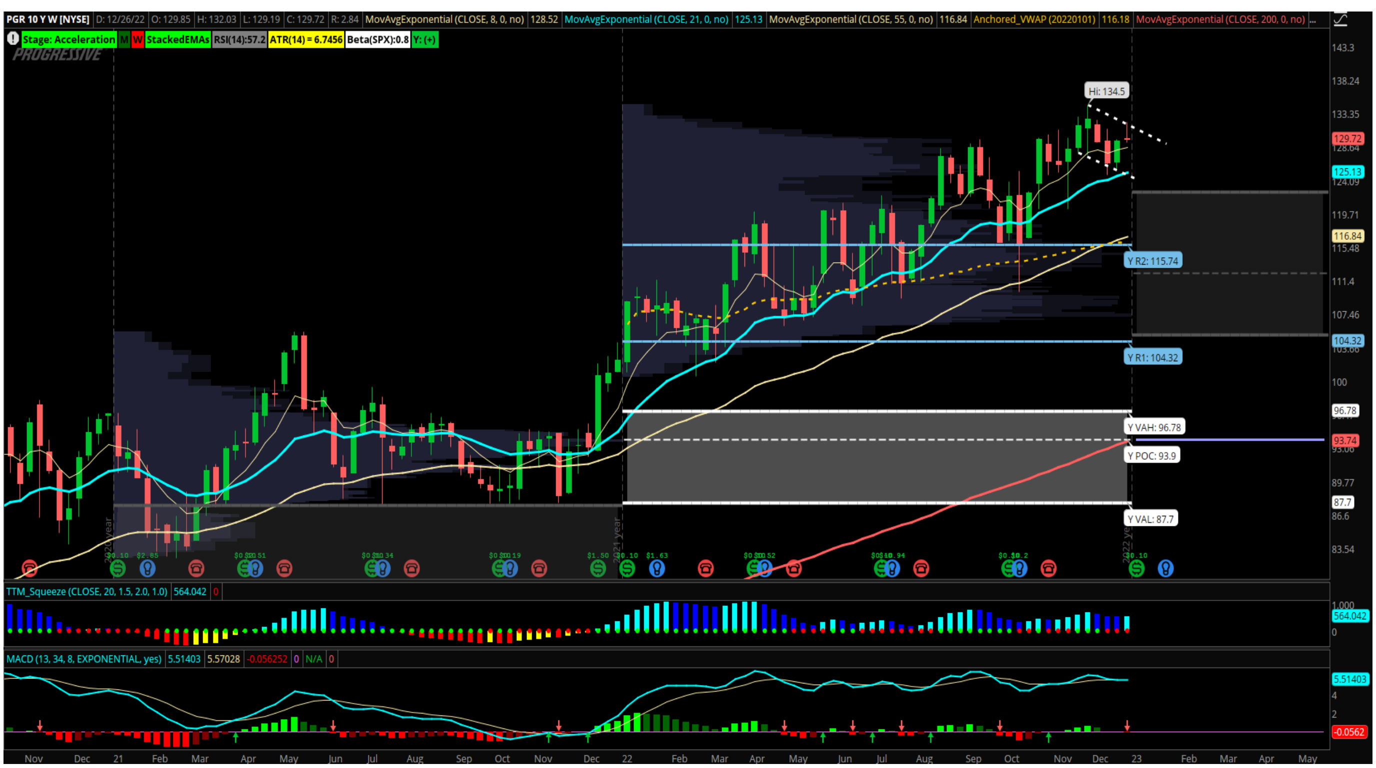
Monster Beverage (MNST) with relative strength in Q4 of 2022 and forming a weekly bull flag near the recent highs above 100. A follow through above 104 can see the larger monthly chart 1.272 fib extension targets at 107.50 and then 117.



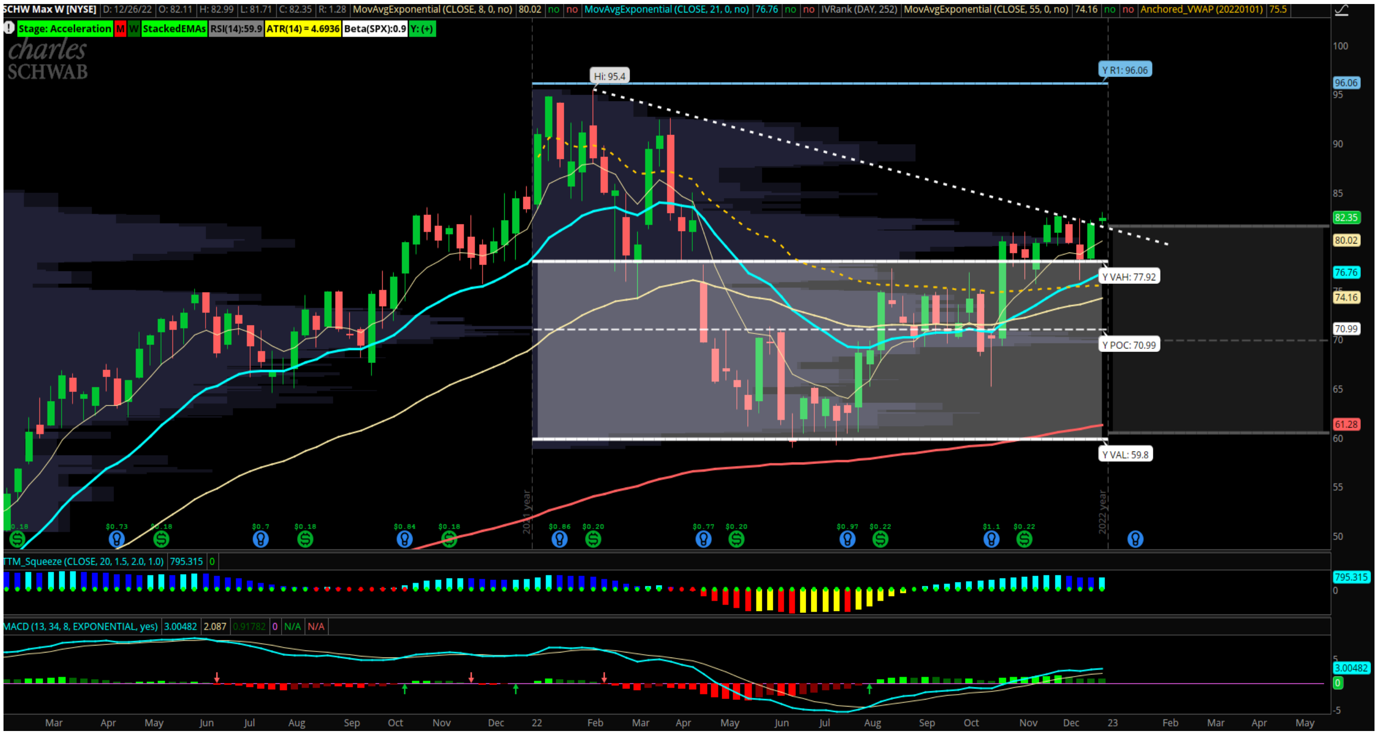
Northrop Grumman (NOC) forming a strong bull flag near 2022 highs as it sees a strong close to the year it outperformed and likely extends out of this pattern towards 585 and then 600. An ideal entry into the trend on NOC would be a pullback to the 21-week EMA currently near 508.



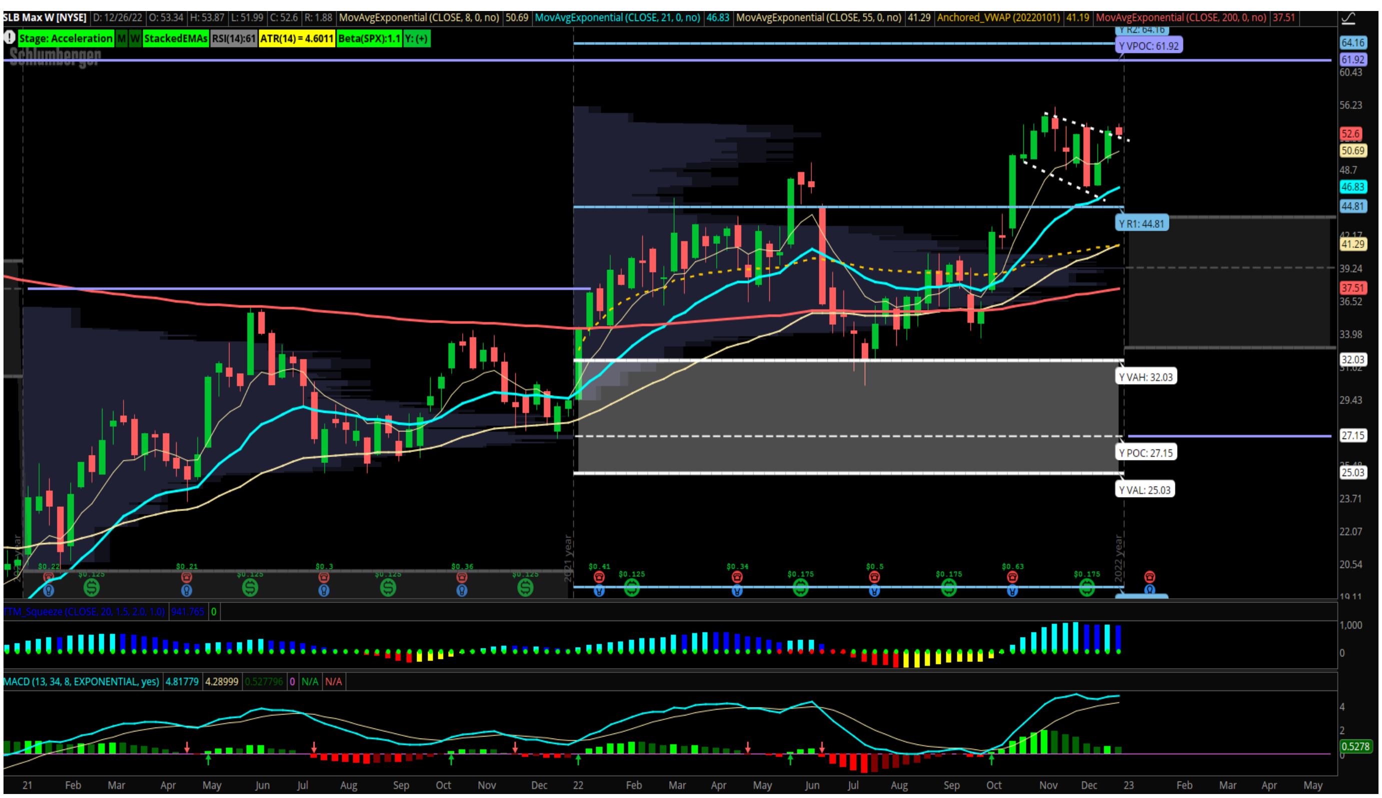
Progressive (PGR) shares have been riding the 21-week EMA higher most of 2022 as the insurance stocks outperformed. PGR is forming another high tight bull flag as it coils for a new move towards 150. An optimal entry here on PGR may be closer to 125.



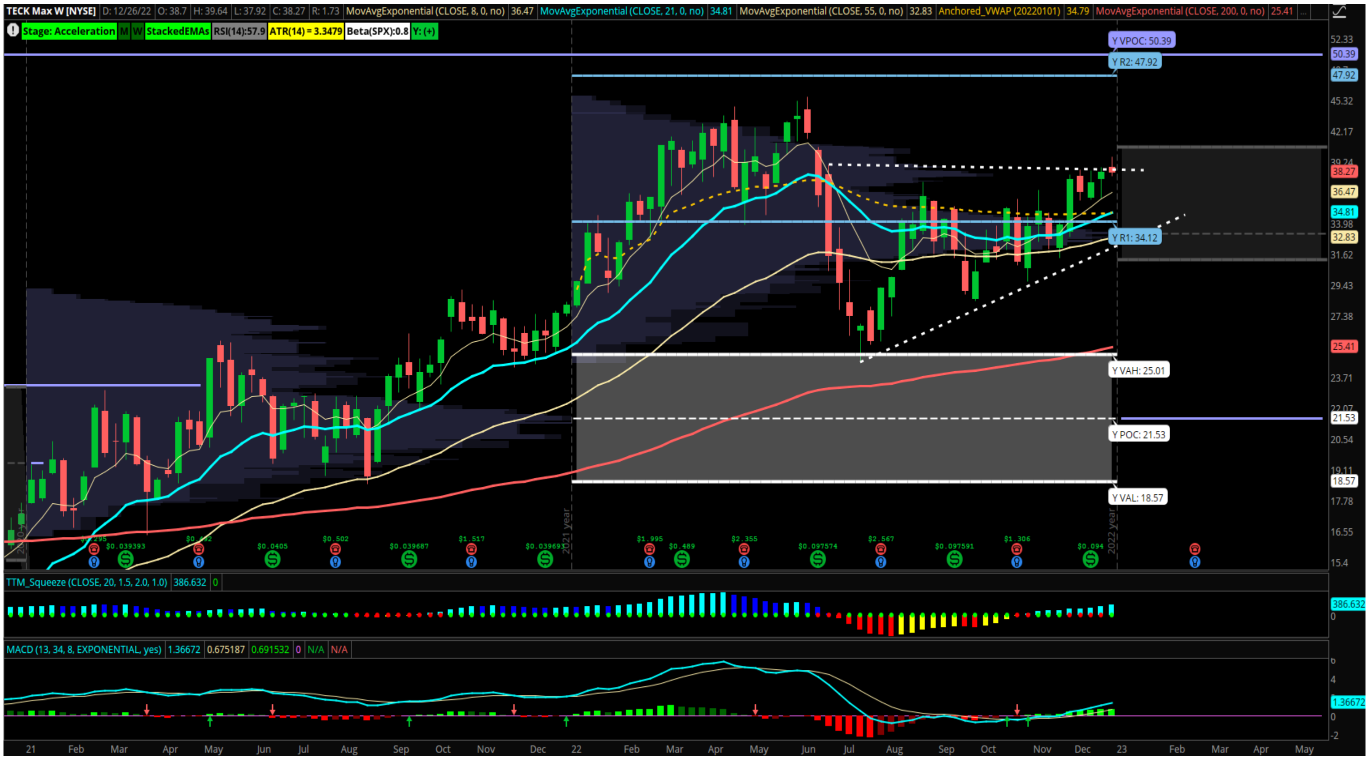
Schwab (SCHW) is a financial showing strength since the October lows and recently broke out above yearly value area at 78 so that's a key level to hold on dips while now clearing the weekly trendline from its highs at 95. A move back to those old highs at 95 this coming year is more than reasonable.



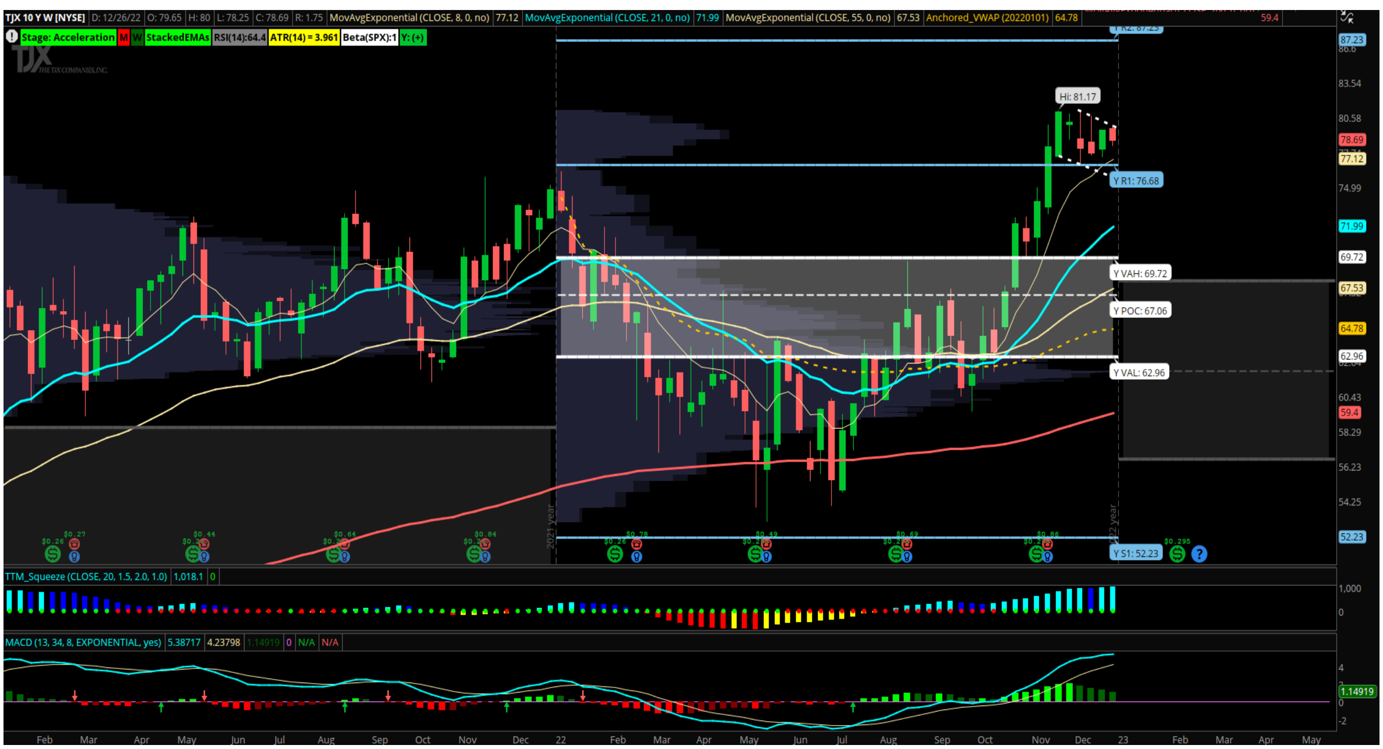
Schlumberger (SLB) shares forming a large weekly bull flag and cup and handle sort of pattern near highs as the relative strength energy name has a clear path to 62 overhead as an untested yearly VPOC. A dip back to the lower edge of the recent range near 47 would be an ideal entry location.



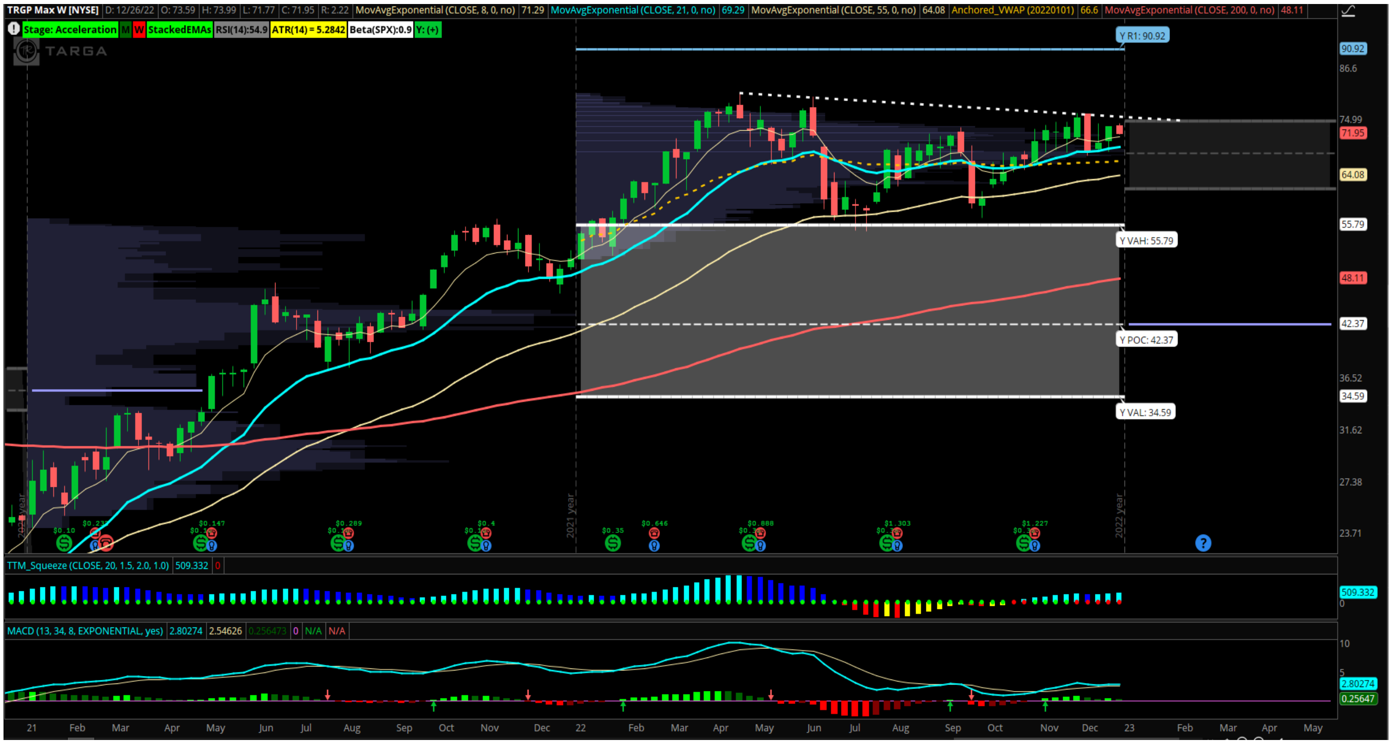
Teck Resources (TECK) shares building an ascending triangle on the weekly timeframe and showing strength with MACD and the Bollinger band squeezing tight and pointing higher. A breakout above 40 likely targets the overhead untested yearly VPOC at 50.



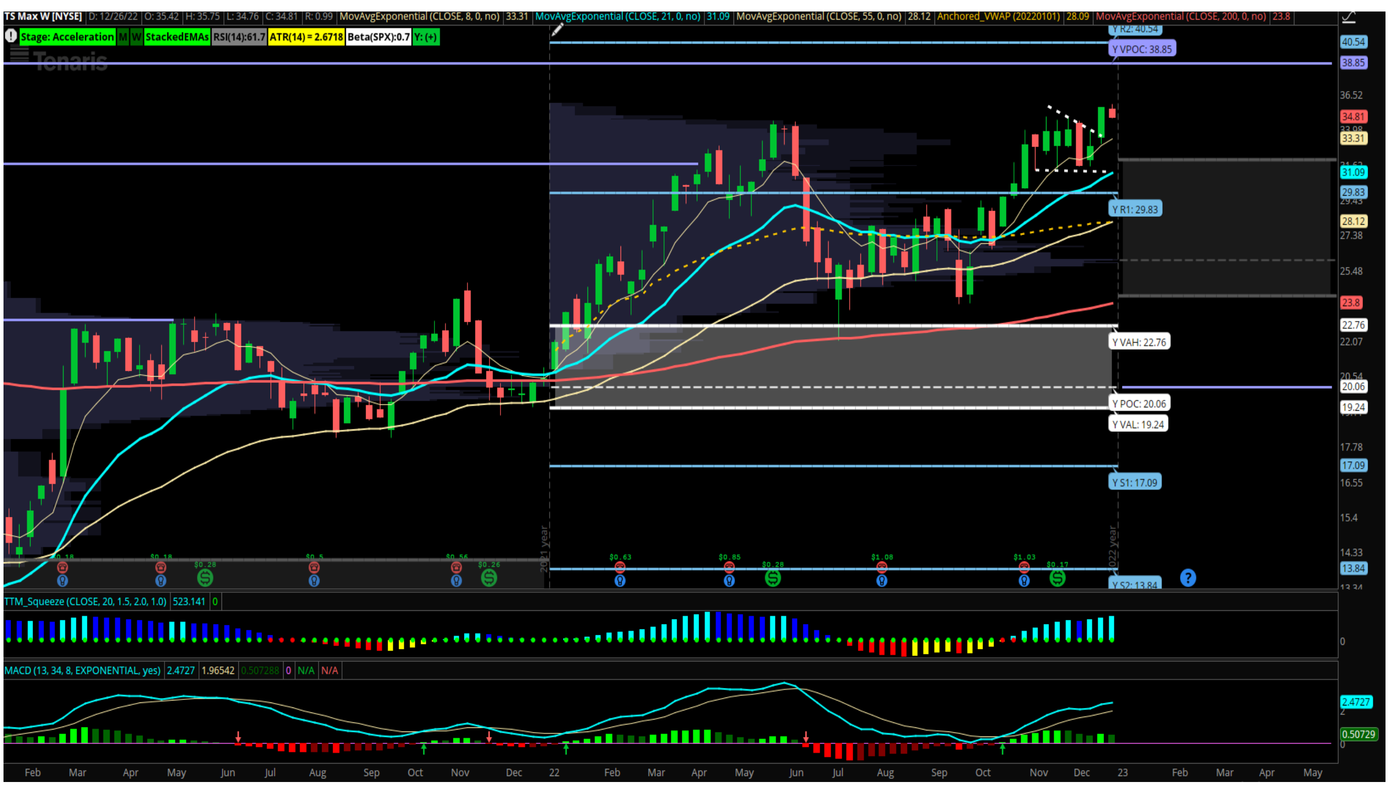
TJX (TJX) shares are showing great strength in the retail sector and Q4 saw a breakout of yearly value but now forming a bull flag and likely has room to consolidate further between 75-80 on its way to higher levels. TJX has its 1.272 fib extension target at 82.50 and then the 1.618 extension at 90.



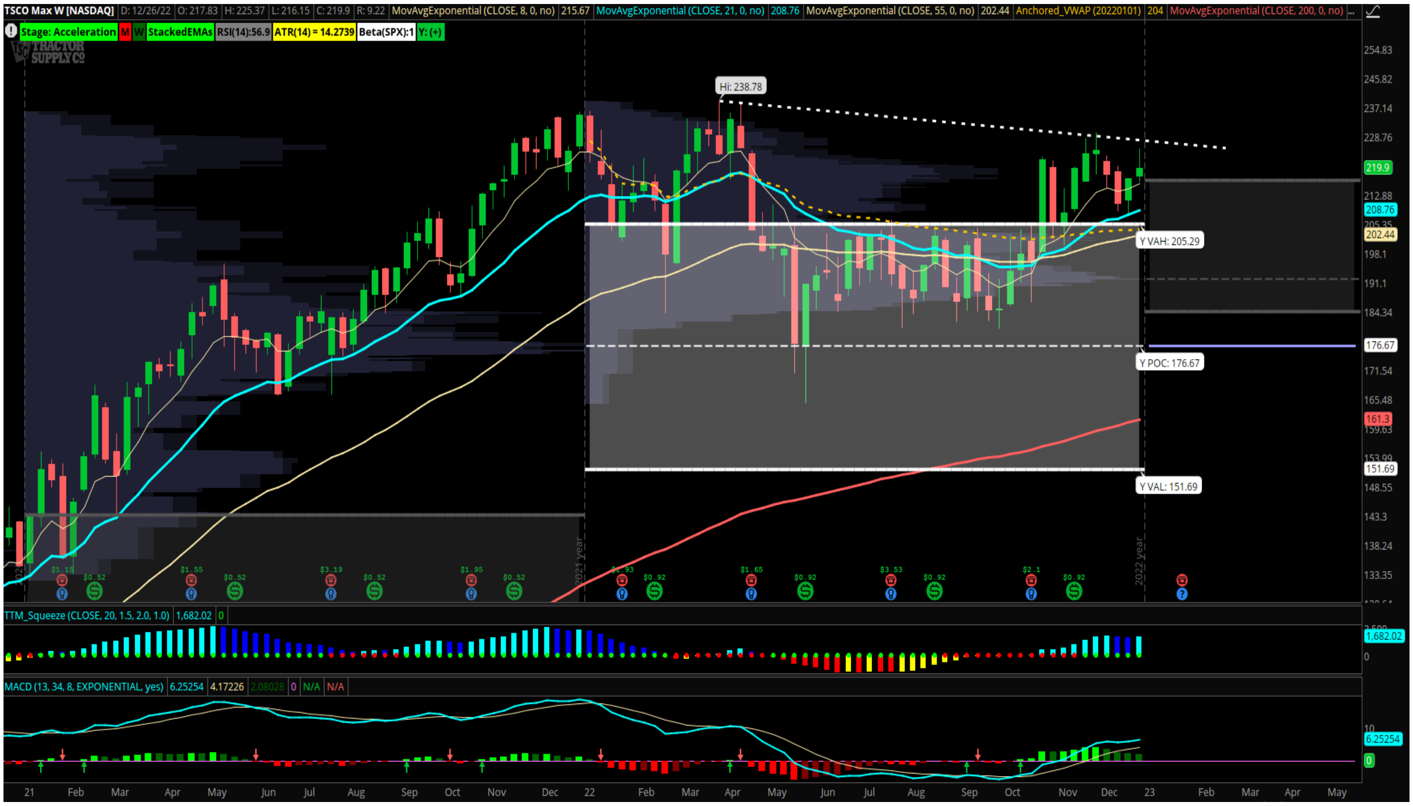
Targa Resources (TRGP) shares are building a tightly coiled Bollinger band squeeze with a slanted inverted head and shoulders base pattern. A breakout above 75 yearly value highs can see a swift move to the 87.50 level as it's the 1.272 fib extension and has an untested VPOC at 103 as an extended target.



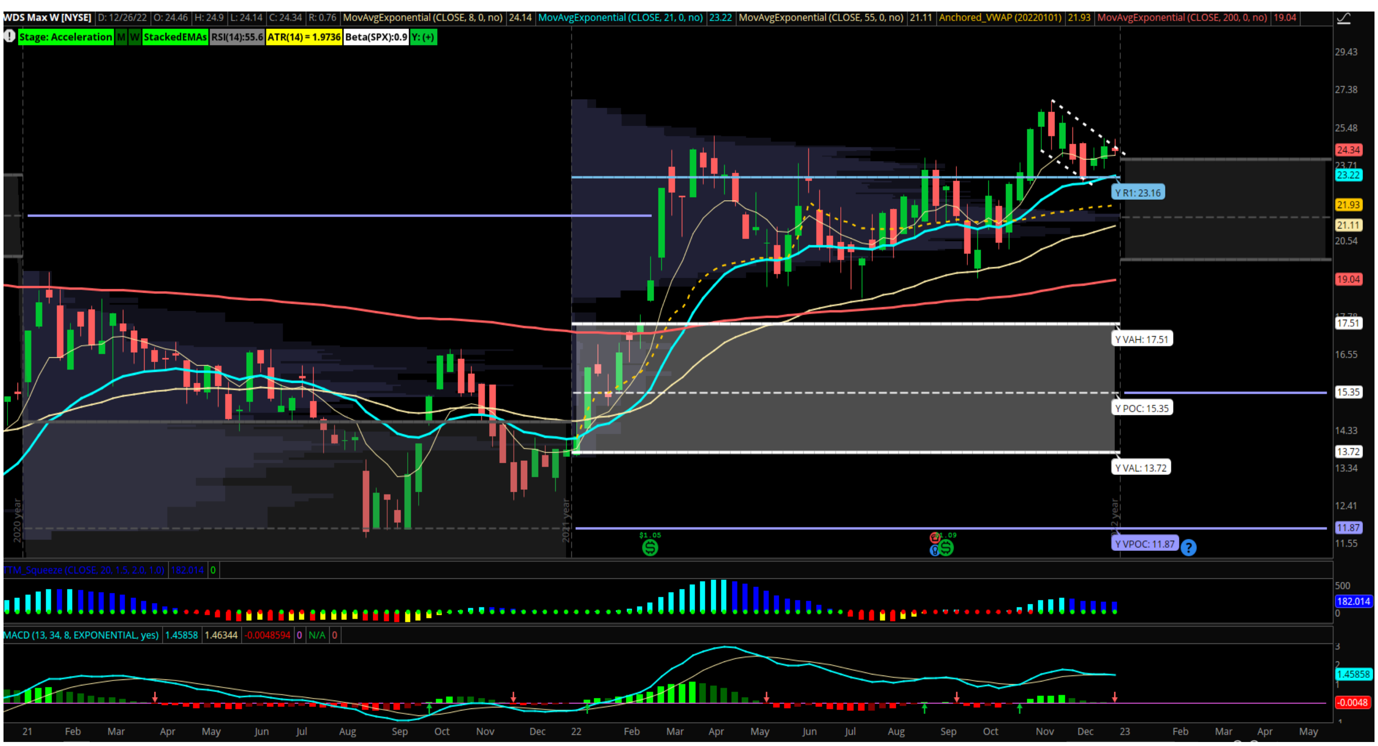
Tenaris (TS) with shares popping out of its bull flag that's forming near recent highs. The stock has a VPOC target overhead at 38.85 with 40 the next resistance above that. TS has strong support at 31 if there was a pullback initially into the new year.



Tractor Supply (TSCO) shares are nearing a potential breakout of a small trendline from 2022 highs as it builds a handle to this cup formation and now above yearly value area resistance at 215. TSCO has a strong trend in place and a breakout to highs can likely see the first 1.272 fib extension at 260.



Woodside Energy (WDS) shares are forming a bull flag above yearly value area as the stock had a strong Q4 of 2022 breaking above the 23-resistance level. A lower beta energy name based in Australia and pays an 8.2% dividend yield. WDS can target at 30 and longer term can see 35 which is a yearly VPOC.



Large 2023 Options Open Interest Positions of Note

The new OptionsHawk Application has the Hawk Database integrated allowing for easy filtering across fundamental, technical and options data for trade idea generation. It is an awesome product I am building and highly suggest adding it to your toolbox.

February 2023

Bullish: There are a ton of **Meta (META)** February calls bought in open interest while **Doordash (DASH), Amazon (AMZN), and Disney (DIS)** also have massive bull trades. We can see a strong bias to Software with large bull positions in **Alteryx (AYX), Atlassian (TEAM), Blackline (BL), Okta (OKTA), Microsoft (MSFT), Splunk (SPLK),** and **Bill.com (BILL)** which will capture the Q4 reporting cycle. **Marvell (MRVL)** is a Semi with bullish positioning along with **Texas Instruments (TXN)**. A few Healthcare names stand out with large bullish open interest in **Glaxo (GSK), Lilly (LLY), Pfizer (PFE),** and **Humana (HUM)**. **FreshPet (FRPT)** and **Super Micro (SMCI)** are two small caps with unusual large bull positions in OI while **Generac (GNRC)** a beaten-up name seeing higher Delta calls accumulate in February.

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
11/10/2022	META	META 100 17 FEB 23 85 CALL	$28.48	0.83	$32.92	40,243	15.59%	$132,479,956
10/27/2022	META	META 100 17 FEB 23 105 CALL	$11.40	0.53	$16.90	45,744	48.25%	$77,307,360
10/26/2022	MSFT	MSFT 100 17 FEB 23 210 CALL	$35.65	0.75	$36	12,727	0.98%	$45,817,200
12/1/2022	DASH	DASH 100 17 FEB 23 45 CALL	$15.75	0.79	$10.63	35,061	32.51%	$37,269,843
10/28/2022	AMZN	AMZN 100 17 FEB 23 90 CALL	$19.25	0.75	$4.80	71,655	75.06%	$34,394,400
12/6/2022	AYX	AYX 100 17 FEB 23 40 CALL	$5.15	0.59	$11.50	28,388	123.30%	$32,646,200
11/9/2022	META	META 100 17 FEB 23 110 CALL	$9.40	0.48	$13.80	15,021	46.81%	$20,728,980
11/9/2022	META	META 100 17 FEB 23 115 CALL	$7.85	0.42	$11.20	18,326	42.68%	$20,525,120
11/14/2022	DIS	DIS 100 17 FEB 23 85 CALL	$15.25	0.76	$6.40	20,557	58.03%	$13,156,480
11/14/2022	META	META 100 17 FEB 23 120 CALL	$10.95	0.5	$9	12,636	17.81%	$11,372,400
9/2/2022	NVDA	NVDA 100 17 FEB 23 150 CALL	$16.35	0.5	$22	4,382	34.56%	$9,640,400
11/7/2022	OKTA	OKTA 100 17 FEB 23 55 CALL	$4.20	0.41	$14.90	5,363	254.76%	$7,990,870
12/16/2022	NVDA	NVDA 100 17 FEB 23 165 CALL	$15.30	0.56	$13.35	4,742	12.75%	$6,330,570
10/28/2022	MSFT	MSFT 100 17 FEB 23 235 CALL	$17.45	0.54	$17.25	3,403	1.15%	$5,870,175
11/4/2022	TEAM	TEAM 100 17 FEB 23 140 CALL	$12.90	0.46	$18.40	2,976	42.64%	$5,475,840
12/5/2022	AMZN	AMZN 100 17 FEB 23 95 CALL	$6.10	0.47	$3.05	16,826	50%	$5,131,930
11/9/2022	BL	BL 100 17 FEB 23 60 CALL	$5.10	0.46	$9.40	5,008	84.31%	$4,707,520
12/7/2022	MRVL	MRVL 100 17 FEB 23 40 CALL	$4.55	0.58	$2.63	14,331	42.20%	$3,769,053
12/14/2022	TSLA	TSLA 100 17 FEB 23 160 CALL	$18.56	0.56	$12.60	2,965	32.11%	$3,735,900
12/15/2022	CVX	CVX 100 17 FEB 23 160 CALL	$14.97	0.67	$14.88	2,471	0.60%	$3,676,848
11/2/2022	GNRC	GNRC 100 17 FEB 23 90 CALL	$26.20	0.77	$12.23	2,988	53.32%	$3,654,324
12/6/2022	FANG	FANG 100 17 FEB 23 135 CALL	$16.50	0.63	$8.25	4,334	50%	$3,575,550
9/21/2022	SMCI	SMCI 100 17 FEB 23 70 CALL	$4.50	0.37	$13.90	2,340	208.89%	$3,252,600
12/7/2022	TSLA	TSLA 100 17 FEB 23 180 CALL	$17.21	0.51	$6.56	4,794	61.88%	$3,144,864
12/16/2022	AMZN	AMZN 100 17 FEB 23 70 CALL	$19.40	0.87	$17	1,846	12.37%	$3,138,200
12/1/2022	MSFT	MSFT 100 17 FEB 23 255 CALL	$14.55	0.52	$7	4,339	51.89%	$3,037,300
7/15/2022	FCX	FCX 100 17 FEB 23 40 CALL	$0.93	0.19	$1.89	15,464	103.23%	$2,922,696
10/26/2022	FRPT	FRPT 100 17 FEB 23 65 CALL	$6.20	0.47	$2.83	10,196	54.35%	$2,885,468
12/12/2022	PFE	PFE 100 17 FEB 23 52.5 CALL	$2.42	0.52	$1.70	16,878	29.75%	$2,869,260
12/9/2022	AMD	AMD 100 17 FEB 23 70 CALL	$7.15	0.55	$3.56	7,342	50.21%	$2,613,752
12/5/2022	LUMN	LUMN 100 17 FEB 23 5 CALL	$0.71	0.62	$0.71	33,701	0%	$2,392,771
10/18/2022	RH	RH 100 17 FEB 23 250 CALL	$33.30	0.56	$21.80	1,076	34.53%	$2,345,680
10/21/2022	SPLK	SPLK 100 17 FEB 23 85 CALL	$7.55	0.46	$6.27	3,574	16.95%	$2,240,898
10/31/2022	PINS	PINS 100 17 FEB 23 27.5 CALL	$2.92	0.48	$1.42	15,610	51.37%	$2,216,620
11/14/2022	AMZN	AMZN 100 17 FEB 23 85 CALL	$19.05	0.78	$7.05	3,101	62.99%	$2,186,205
12/14/2022	UBER	UBER 100 17 FEB 23 20 CALL	$8	0.89	$5.62	3,798	29.75%	$2,134,476
9/27/2022	AAWW	AAWW 100 17 FEB 23 95 CALL	$6	0.55	$6.70	2,904	11.67%	$1,945,680
11/4/2022	TEAM	TEAM 100 17 FEB 23 155 CALL	$7.10	0.29	$10.50	1,776	47.89%	$1,864,800

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
12/16/2022	HUM	HUM 100 17 FEB 23 525 CALL	$15.60	0.4	$14	1,330	10.26%	$1,862,000
12/12/2022	GSK	GSK 100 17 FEB 23 38 CALL	$1.16	0.37	$0.65	28,542	43.97%	$1,855,230
10/31/2022	TXN	TXN 100 17 FEB 23 175 CALL	$5.75	0.33	$5.30	3,270	7.83%	$1,733,100
11/16/2022	SCPL	SCPL 100 17 FEB 23 15 CALL	$1.50	0.59	$1.64	10,427	9.33%	$1,710,028
12/15/2022	LLY	LLY 100 17 FEB 23 380 CALL	$9.66	0.36	$8.82	1,879	8.70%	$1,657,278
12/15/2022	OXY	OXY 100 17 FEB 23 65 CALL	$4	0.47	$3.50	4,408	12.50%	$1,542,800
11/30/2022	SLB	SLB 100 17 FEB 23 55 CALL	$2.60	0.4	$1.64	9,365	36.92%	$1,535,860
10/26/2022	GOOG	GOOG 100 17 FEB 23 100 CALL	$7.60	0.52	$1.82	7,910	76.05%	$1,439,620
12/19/2022	DIS	DIS 100 17 FEB 23 90 CALL	$4.15	0.44	$4.05	3,331	2.41%	$1,349,055
11/14/2022	IBM	IBM 100 17 FEB 23 150 CALL	$5.90	0.43	$1.75	7,646	70.34%	$1,338,050
12/1/2022	FCX	FCX 100 17 FEB 23 42 CALL	$2.73	0.44	$1.35	9,627	50.55%	$1,299,645
11/17/2022	AMD	AMD 100 17 FEB 23 75 CALL	$8.25	0.55	$2.09	5,999	74.67%	$1,253,791
12/16/2022	GM	GM 100 17 FEB 23 39 CALL	$1.30	0.36	$1.04	10,099	20%	$1,050,296
11/17/2022	BILL	BILL 100 17 FEB 23 120 CALL	$19.38	0.58	$9.38	1,112	51.60%	$1,043,056
11/2/2022	GNRC	GNRC 100 17 FEB 23 95 CALL	$22.20	0.69	$8.90	1,139	59.91%	$1,013,710
11/30/2022	LVS	LVS 100 17 FEB 23 52.5 CALL	$1.87	0.33	$1.36	7,408	27.27%	$1,007,488
12/1/2022	INTC	INTC 100 17 FEB 23 30 CALL	$2.06	0.51	$0.54	18,572	73.79%	$1,002,888
12/16/2022	TSM	TSM 100 17 FEB 23 75 CALL	$6	0.59	$5.25	1,773	12.50%	$930,825
12/16/2022	BX	BX 100 17 FEB 23 75 CALL	$6.35	0.53	$5.14	1,711	19.06%	$879,454
12/6/2022	SMCI	SMCI 100 17 FEB 23 95 CALL	$4.40	0.34	$3.38	2,135	23.18%	$721,630
11/28/2022	V	V 100 17 FEB 23 225 CALL	$6.75	0.38	$2.59	2,701	61.63%	$699,559
12/15/2022	GFF	GFF 100 17 FEB 23 32 CALL	$5.33	0.71	$4.30	1,622	19.32%	$697,460
12/19/2022	FRPT	FRPT 100 17 FEB 23 60 CALL	$3.20	0.38	$2.90	2,399	9.38%	$695,710
11/14/2022	UBER	UBER 100 17 FEB 23 30 CALL	$3.10	0.52	$0.81	7,587	73.87%	$614,547
6/29/2022	OXY	OXY 100 17 FEB 23 67.5 CALL	$8.36	0.49	$2.54	2,350	69.62%	$596,900
11/30/2022	UPST	UPST 100 17 FEB 23 22.5 CALL	$2.50	0.46	$0.68	8,336	72.80%	$566,848
12/13/2022	LAC	LAC 100 17 FEB 23 27.5 CALL	$1.45	0.37	$0.63	6,508	56.55%	$410,004
12/6/2022	U	U 100 17 FEB 23 40 CALL	$3.75	0.45	$0.85	4,064	77.33%	$345,440
11/28/2022	PSTG	PSTG 100 17 FEB 23 28 CALL	$4.50	0.68	$1.62	2,091	64%	$338,742

Bearish: We can see plenty of put positioning across mega-cap tech but also large put buys in Fintech losers like **Upstart (UPST)** and **Affirm (AFRM)**. **Blackstone (BX)** and **Dollar Tree (DLTR)** are two names with large put buys in open interest as well as high valuation names **Snowflake (SNOW), Wayfair (W)** and **Unity (U)**. **Whirlpool (WHR)** another interesting one with large put buys in open interest. **Lennar (LEN)** a large homebuilder with size put buys along with **DR Horton (DHI)** and **Knight (KNX)** a trucker with over 11,000 February $50 puts bought in OI.

Date	Ticker	Contract	Price	Delt	Premium	Last	Current O	Price %	Current Valu
10/28/2022	AAPL	AAPL 100 17 FEB 23 155 PUT	$10.31	-0.44	$4,100,580	$23.65	17,121	129.39%	$40,491,165
11/3/2022	AAPL	AAPL 100 17 FEB 23 140 PUT	$10.32	-0.45	$12,656,800	$11.47	25,603	11.14%	$29,366,641
10/28/2022	AMZN	AMZN 100 17 FEB 23 95 PUT	$7.07	-0.35	$2,181,270	$12.40	23,100	75.39%	$28,644,000
11/4/2022	AMZN	AMZN 100 17 FEB 23 90 PUT	$8.15	-0.43	$8,721,075	$9.03	31,583	10.80%	$28,519,449
11/3/2022	TSLA	TSLA 100 17 FEB 23 165 PUT	$8.45	-0.17	$4,350,720	$24.55	9,960	190.53%	$24,451,800
10/20/2022	TSLA	TSLA 100 17 FEB 23 150 PUT	$8.75	-0.16	$3,755,160	$16.05	12,134	83.43%	$19,475,070
10/17/2022	META	META 100 17 FEB 23 115 PUT	$9.38	-0.28	$2,355,565	$10.69	15,461	13.97%	$16,527,809
11/3/2022	BX	BX 100 17 FEB 23 90 PUT	$8.45	-0.45	$2,750,880	$18.10	7,032	114.20%	$12,727,920
11/10/2022	DLTR	DLTR 100 17 FEB 23 155 PUT	$9.10	-0.36	$8,100,000	$14.65	8,398	60.99%	$12,303,070
8/17/2022	BILL	BILL 100 17 FEB 23 150 PUT	$32.58	-0.39	$4,272,390	$39.80	2,979	22.16%	$11,856,420
8/17/2022	AAPL	AAPL 100 17 FEB 23 170 PUT	$11.95	-0.41	$1,898,050	$38.29	3,054	220.42%	$11,693,766
11/15/2022	BX	BX 100 17 FEB 23 85 PUT	$3.67	-0.22	$4,167,000	$14.07	8,226	283.38%	$11,573,982
11/18/2022	AMD	AMD 100 17 FEB 23 70 PUT	$6.20	-0.37	$1,852,560	$8.79	12,707	41.77%	$11,169,453
11/15/2022	DLTR	DLTR 100 17 FEB 23 165 PUT	$10.80	-0.4	$4,927,500	$23.10	4,743	113.89%	$10,956,330
11/15/2022	UPST	UPST 100 17 FEB 23 22.5 PUT	$6.15	-0.39	$1,521,510	$8.62	11,769	40.16%	$10,144,878
12/9/2022	NFLX	NFLX 100 17 FEB 23 305 PUT	$22.20	-0.36	$4,747,500	$34.35	2,800	54.73%	$9,618,000
6/29/2022	AFRM	AFRM 100 17 FEB 23 20 PUT	$7.15	-0.34	$1,467,895	$10.64	8,578	48.81%	$9,126,992
9/13/2022	AAPL	AAPL 100 17 FEB 23 125 PUT	$3.55	-0.15	$1,132,560	$4.70	18,466	32.39%	$8,679,020
12/7/2022	MPW	MPW 100 17 FEB 23 11 PUT	$0.75	-0.35	$1,745,120	$1.50	52,369	100%	$7,855,350
10/19/2022	XP	XP 100 17 FEB 23 17 PUT	$2.30	-0.4	$4,320,480	$3.30	23,189	43.48%	$7,652,370
9/2/2022	META	META 100 17 FEB 23 145 PUT	$13.50	-0.31	$1,463,280	$27.20	2,659	101.48%	$7,232,480
12/2/2022	NVDA	NVDA 100 17 FEB 23 150 PUT	$8.22	-0.28	$2,779,670	$8.11	8,615	1.34%	$6,986,765
9/2/2022	META	META 100 17 FEB 23 140 PUT	$11.65	-0.28	$1,180,000	$26.40	2,605	126.61%	$6,877,200
11/21/2022	U	U 100 17 FEB 23 35 PUT	$7.20	-0.48	$1,213,990	$8.50	7,738	18.06%	$6,577,300
11/9/2022	QS	QS 100 17 FEB 23 7.5 PUT	$1.69	-0.45	$1,700,647	$2.04	31,664	20.71%	$6,459,456
8/31/2022	META	META 100 17 FEB 23 130 PUT	$7.85	-0.19	$916,880	$19.70	3,132	150.96%	$6,170,040
11/9/2022	DIS	DIS 100 17 FEB 23 90 PUT	$7.83	-0.49	$950,370	$7.58	7,636	3.19%	$5,788,088
9/19/2022	GOOGL	GOOGL 100 17 FEB 23 95 PUT	$5.85	-0.33	$2,021,215	$8.95	6,015	52.99%	$5,383,425
11/15/2022	TGT	TGT 100 17 FEB 23 160 PUT	$6.80	-0.26	$1,029,555	$17.77	2,972	161.32%	$5,281,244
11/1/2022	META	META 100 17 FEB 23 105 PUT	$16.60	-0.59	$1,715,280	$6.41	8,165	61.39%	$5,233,765
12/16/2022	CAT	CAT 100 17 FEB 23 200 PUT	$3.50	-0.16	$3,740,040	$3.25	15,903	7.14%	$5,168,475
12/12/2022	PARA	PARA 100 17 FEB 23 20 PUT	$2.24	-0.51	$2,256,576	$3.57	14,279	59.37%	$5,097,603
10/27/2022	META	META 100 17 FEB 23 100 PUT	$11.13	-0.41	$3,341,655	$4.85	9,834	56.42%	$4,769,490
8/2/2022	NVDA	NVDA 100 17 FEB 23 170 PUT	$18.90	-0.32	$1,953,745	$17.64	2,599	6.67%	$4,584,636
12/16/2022	COIN	COIN 100 17 FEB 23 35 PUT	$6.15	-0.4	$5,068,125	$5.80	7,750	5.69%	$4,495,000
11/21/2022	JPM	JPM 100 17 FEB 23 130 PUT	$5.75	-0.39	$939,020	$6.05	7,381	5.22%	$4,465,505
12/5/2022	BX	BX 100 17 FEB 23 70 PUT	$2.72	-0.2	$2,758,800	$4.75	9,367	74.63%	$4,449,325
7/25/2022	MSFT	MSFT 100 17 FEB 23 265 PUT	$26.15	-0.5	$3,812,760	$27.92	1,534	6.77%	$4,282,928

Date	Ticker	Contract	Price	Delt	Premium	Last	Current O	Price %	Current Valu
11/11/2022	WHR	WHR 100 17 FEB 23 150 PUT	$11	-0.42	$948,200	$13.95	2,989	26.82%	$4,169,655
12/9/2022	W	W 100 17 FEB 23 30 PUT	$2.87	-0.22	$2,971,630	$3.31	12,450	15.33%	$4,120,950
11/18/2022	TSLA	TSLA 100 17 FEB 23 100 PUT	$2.22	-0.06	$1,908,090	$2.40	16,050	8.11%	$3,852,000
12/1/2022	SNOW	SNOW 100 17 FEB 23 145 PUT	$16.40	-0.44	$2,115,880	$18	2,132	9.76%	$3,837,600
12/1/2022	AMD	AMD 100 17 FEB 23 80 PUT	$8.80	-0.52	$1,239,300	$16.10	2,318	82.95%	$3,731,980
11/9/2022	DIS	DIS 100 17 FEB 23 85 PUT	$5.75	-0.4	$2,490,075	$5	7,217	13.04%	$3,608,500
11/29/2022	TXN	TXN 100 17 FEB 23 175 PUT	$10.85	-0.5	$1,170,750	$13.16	2,663	21.29%	$3,504,508
11/30/2022	MARA	MARA 100 17 FEB 23 5 PUT	$1.11	-0.27	$1,363,936	$1.69	20,584	52.25%	$3,478,696
11/29/2022	OXY	OXY 100 17 FEB 23 70 PUT	$6.45	-0.48	$1,197,340	$9.30	3,635	44.19%	$3,380,550
9/23/2022	CRM	CRM 100 17 FEB 23 145 PUT	$14.30	-0.42	$1,643,070	$18.10	1,776	26.57%	$3,214,560
12/5/2022	GME	GME 100 17 FEB 23 25 PUT	$4.52	-0.37	$1,447,620	$7.11	4,436	57.30%	$3,153,996
11/21/2022	U	U 100 17 FEB 23 30 PUT	$4.35	-0.33	$1,339,450	$5.25	5,963	20.69%	$3,130,575
12/15/2022	ARES	ARES 100 17 FEB 23 60 PUT	$2.05	-0.2	$1,032,175	$2.06	15,126	0.49%	$3,115,956
11/10/2022	BYND	BYND 100 17 FEB 23 15 PUT	$4.04	-0.4	$855,100	$4.20	7,364	3.96%	$3,092,880
9/22/2022	CRM	CRM 100 17 FEB 23 150 PUT	$14.99	-0.43	$1,002,330	$22.65	1,314	51.10%	$2,976,210
12/6/2022	CVX	CVX 100 17 FEB 23 175 PUT	$9.75	-0.47	$1,005,000	$12.11	2,409	24.21%	$2,917,299
12/5/2022	C	C 100 17 FEB 23 45 PUT	$2.38	-0.43	$2,067,780	$3.05	9,455	28.15%	$2,883,775
12/6/2022	BX	BX 100 17 FEB 23 80 PUT	$7.22	-0.46	$956,080	$10.25	2,706	41.97%	$2,773,650
7/29/2022	OXY	OXY 100 17 FEB 23 67.5 PUT	$10.73	-0.44	$833,280	$7.35	3,471	31.50%	$2,551,185
11/29/2022	FCX	FCX 100 17 FEB 23 32 PUT	$1.58	-0.24	$1,598,960	$1.03	24,214	34.81%	$2,494,042
12/6/2022	XOM	XOM 100 17 FEB 23 105 PUT	$6	-0.46	$2,361,920	$5.30	4,635	11.67%	$2,456,550
9/15/2022	CRM	CRM 100 17 FEB 23 135 PUT	$7.45	-0.24	$1,017,750	$11.65	1,993	56.38%	$2,321,845
11/15/2022	KNX	KNX 100 17 FEB 23 50 PUT	$1.82	-0.24	$1,453,880	$2.05	11,253	12.64%	$2,306,865
12/9/2022	ON	ON 100 17 FEB 23 70 PUT	$5.60	-0.4	$855,570	$9.18	2,441	63.93%	$2,240,838
12/12/2022	LEN	LEN 100 17 FEB 23 77.5 PUT	$2.29	-0.21	$2,355,430	$1.52	14,164	33.62%	$2,152,928
10/27/2022	GOOG	GOOG 100 17 FEB 23 85 PUT	$4.35	-0.3	$1,784,640	$3.45	6,120	20.69%	$2,111,400
10/28/2022	ASTS	ASTS 100 17 FEB 23 5 PUT	$0.75	-0.23	$960,800	$1.50	13,296	100%	$1,994,400
12/16/2022	DE	DE 100 17 FEB 23 380 PUT	$7.50	-0.2	$987,000	$6.25	3,139	16.67%	$1,961,875
10/27/2022	META	META 100 17 FEB 23 90 PUT	$7	-0.29	$1,729,000	$2.54	7,604	63.71%	$1,931,416
12/14/2022	UNH	UNH 100 17 FEB 23 500 PUT	$7.50	-0.21	$1,180,410	$11.50	1,673	53.33%	$1,923,950
12/15/2022	AMD	AMD 100 17 FEB 23 60 PUT	$3.15	-0.28	$1,443,840	$3.49	5,245	10.79%	$1,830,505
11/23/2022	JPM	JPM 100 17 FEB 23 125 PUT	$3.20	-0.25	$753,720	$4.20	4,298	31.25%	$1,805,160
11/14/2022	PFE	PFE 100 17 FEB 23 50 PUT	$2.75	-0.5	$903,972	$1.64	10,882	40.36%	$1,784,648
12/15/2022	JNJ	JNJ 100 17 FEB 23 175 PUT	$3.75	-0.4	$988,760	$4.65	3,649	24%	$1,696,785
12/5/2022	ARI	ARI 100 17 FEB 23 10 PUT	$0.49	-0.25	$1,297,450	$0.50	33,141	2.04%	$1,657,050
11/28/2022	AMAT	AMAT 100 17 FEB 23 105 PUT	$8.65	-0.46	$1,148,000	$8.05	1,937	6.94%	$1,559,285
11/15/2022	CAT	CAT 100 17 FEB 23 220 PUT	$9.40	-0.31	$882,660	$7.78	1,950	17.23%	$1,517,100
12/5/2022	DHI	DHI 100 17 FEB 23 75 PUT	$2.33	-0.22	$1,652,050	$1.40	10,707	39.91%	$1,498,980
11/8/2022	TXN	TXN 100 17 FEB 23 155 PUT	$5.94	-0.29	$1,251,250	$4.49	3,325	24.41%	$1,492,925
12/16/2022	GOOS	GOOS 100 17 FEB 23 17 PUT	$1.33	-0.33	$1,407,539	$1.39	10,542	4.51%	$1,465,338
12/7/2022	AMGN	AMGN 100 17 FEB 23 275 PUT	$8.74	-0.37	$1,096,480	$13.75	1,042	57.32%	$1,432,750
12/16/2022	XP	XP 100 17 FEB 23 13 PUT	$0.96	-0.33	$1,260,000	$0.83	16,004	13.54%	$1,328,332
12/8/2022	MET	MET 100 17 FEB 23 67.5 PUT	$1.33	-0.22	$1,044,360	$1.65	7,960	24.06%	$1,313,400
12/16/2022	DXC	DXC 100 17 FEB 23 27 PUT	$2.55	-0.51	$1,107,720	$2.45	5,023	3.92%	$1,230,635
12/16/2022	PYPL	PYPL 100 17 FEB 23 60 PUT	$2.40	-0.22	$874,346	$2.38	5,145	0.83%	$1,224,510
11/15/2022	TSM	TSM 100 17 FEB 23 85 PUT	$7.40	-0.53	$784,400	$9.70	1,257	31.08%	$1,219,290
9/30/2022	PINS	PINS 100 17 FEB 23 25 PUT	$4.94	-0.44	$1,534,500	$2.86	4,171	42.11%	$1,192,906
11/11/2022	SE	SE 100 17 FEB 23 50 PUT	$8.50	-0.42	$1,669,165	$4.40	2,607	48.24%	$1,147,080
8/11/2022	BA	BA 100 17 FEB 23 180 PUT	$25.45	-0.53	$2,024,380	$9.14	1,225	64.09%	$1,119,650
12/12/2022	PINS	PINS 100 17 FEB 23 24 PUT	$2.99	-0.47	$1,237,561	$2.38	4,324	20.40%	$1,029,112
8/29/2022	SNOW	SNOW 100 17 FEB 23 110 PUT	$5.50	-0.1	$1,275,680	$4.20	2,432	23.64%	$1,021,440
11/21/2022	DASH	DASH 100 17 FEB 23 30 PUT	$0.81	-0.06	$1,733,562	$0.47	21,495	41.98%	$1,010,265
8/3/2022	PFSI	PFSI 100 17 FEB 23 40 PUT	$1.81	-0.13	$1,387,500	$0.75	13,254	58.56%	$994,050
11/15/2022	GOGO	GOGO 100 17 FEB 23 15 PUT	$1.22	-0.4	$1,097,955	$1.20	8,053	1.64%	$966,360
12/12/2022	UBS	UBS 100 17 FEB 23 17.5 PUT	$0.75	-0.37	$750,525	$0.70	12,864	6.67%	$900,480
11/9/2022	FCX	FCX 100 17 FEB 23 36 PUT	$5.05	-0.51	$1,050,090	$2.29	3,925	54.65%	$898,825
12/16/2022	VSTO	VSTO 100 17 FEB 23 25 PUT	$2.60	-0.54	$936,000	$2.39	3,753	8.08%	$896,967
10/26/2022	U	U 100 17 FEB 23 25 PUT	$3.88	-0.29	$1,602,755	$2.69	3,219	30.67%	$865,911

March 2023

Bullish: The March expiration has some massive bull positions in open interest including deep ITM calls in **JD (JD), Booking (BKNG), Block (SQ), Alibaba (BABA),** and **AMD (AMD)**. A few software names with notable large bull positions include **Workday (WDAY), HubSpot (HUBS),** and **Coupa (COUP)**, the latter bought out a few days after the calls were bought. **Starbucks (SBUX)** has 189,000 March $105 calls in open interest, a position rolled many times, while **Mondelez (MDLZ)** has 10,000 March $60 calls bought in OI as a leading snack play. Other large caps with large call positions in open interest include **JP Morgan (JPM), Cisco (CSCO), Walmart (WMT), Pinterest (PINS), Visa (V), Dow (DOW)** and **Boeing (BA)**. In Metals, **Alcoa (AA)** and **Freeport (FCX)** each have near $5M positions in calls. A few smaller names with unusual large call sin open interest for March include **Croc's (CROX), Goodyear (GT),** and **Pilgrim Pride (PPC)**.

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
11/3/2022	BKNG	BKNG 100 17 MAR 23 1700 CALL	$297.40	0.69	$333.10	3,049	12%	$101,562,190
11/7/2022	SBUX	SBUX 100 17 MAR 23 105 CALL	$2.30	0.25	$3.31	189,775	43.91%	$62,815,525
11/23/2022	JD	JD 100 17 MAR 23 45 CALL	$11.45	0.74	$14.51	24,531	26.72%	$35,594,481
11/4/2022	SQ	SQ 100 17 MAR 23 45 CALL	$20.54	0.83	$21.70	15,115	5.65%	$32,799,550
9/28/2022	BABA	BABA 100 17 MAR 23 80 CALL	$12.14	0.59	$13.52	23,138	11.37%	$31,282,576
11/2/2022	AMD	AMD 100 17 MAR 23 55 CALL	$11.75	0.67	$12.74	20,589	8.43%	$26,230,386
11/28/2022	WDAY	WDAY 100 17 MAR 23 155 CALL	$12.35	0.48	$27.20	9,438	120.24%	$25,671,360
4/1/2022	AAPL	AAPL 100 17 MAR 23 70 CALL	$105.30	0.97	$65.33	3,492	37.96%	$22,813,236
11/28/2022	HUBS	HUBS 100 17 MAR 23 320 CALL	$31.60	0.46	$26.70	7,289	15.51%	$19,461,630
6/13/2022	BA	BA 100 17 MAR 23 140 CALL	$12.50	0.43	$46.45	3,610	271.60%	$16,768,450
5/19/2022	MSFT	MSFT 100 17 MAR 23 170 CALL	$92	0.85	$91.50	1,740	0.54%	$15,921,000
11/28/2022	BABA	BABA 100 17 MAR 23 90 CALL	$5.15	0.36	$8.41	17,614	63.30%	$14,813,374
11/22/2022	COUP	COUP 100 17 MAR 23 50 CALL	$6.40	0.51	$29.30	5,028	357.81%	$14,732,040
9/13/2022	PINS	PINS 100 17 MAR 23 25 CALL	$4.45	0.58	$2.74	50,603	38.43%	$13,865,222
10/12/2022	BABA	BABA 100 17 MAR 23 85 CALL	$8.05	0.46	$10.70	11,858	32.92%	$12,688,060
11/23/2022	MSFT	MSFT 100 17 MAR 23 250 CALL	$16.80	0.53	$11.12	11,250	33.81%	$12,510,000
10/31/2022	META	META 100 17 MAR 23 95 CALL	$13.35	0.58	$27.05	3,818	102.62%	$10,327,690
8/23/2022	JPM	JPM 100 17 MAR 23 115 CALL	$10.30	0.54	$18.60	5,412	80.58%	$10,066,320
7/28/2022	JPM	JPM 100 17 MAR 23 120 CALL	$7.95	0.45	$13.56	7,309	70.57%	$9,911,004
10/13/2022	NVDA	NVDA 100 17 MAR 23 180 CALL	$3.23	0.17	$10.53	8,662	226.01%	$9,121,086
10/25/2022	NVDA	NVDA 100 17 MAR 23 175 CALL	$6.20	0.26	$12.40	6,064	100%	$7,519,360
7/20/2022	MDLZ	MDLZ 100 17 MAR 23 60 CALL	$5.90	0.58	$7	10,108	18.64%	$7,075,600
12/8/2022	WDAY	WDAY 100 17 MAR 23 170 CALL	$17.10	0.57	$15.85	4,013	7.31%	$6,360,605
8/26/2022	WMT	WMT 100 17 MAR 23 140 CALL	$6.49	0.41	$8.20	7,022	26.35%	$5,758,040
11/17/2022	PDD	PDD 100 17 MAR 23 70 CALL	$12.75	0.6	$21.97	2,600	72.31%	$5,712,200
10/27/2022	META	META 100 17 MAR 23 120 CALL	$7.25	0.37	$10.50	5,396	44.83%	$5,665,800
8/26/2022	CSCO	CSCO 100 17 MAR 23 45 CALL	$4.35	0.56	$3.90	14,130	10.34%	$5,510,700
8/25/2022	CSCO	CSCO 100 17 MAR 23 47.5 CALL	$3.62	0.51	$2.52	21,143	30.39%	$5,328,036
10/28/2022	AA	AA 100 17 MAR 23 45 CALL	$4.05	0.44	$3.95	12,544	2.47%	$4,954,880
9/23/2022	FCX	FCX 100 17 MAR 23 30 CALL	$2.81	0.45	$8.55	5,753	204.27%	$4,918,815
11/15/2022	META	META 100 17 MAR 23 150 CALL	$3.85	0.23	$2.75	16,035	28.57%	$4,409,625
9/19/2022	MO	MO 100 17 MAR 23 42.5 CALL	$2.86	0.49	$4.15	10,092	45.10%	$4,188,180
10/19/2022	LMT	LMT 100 17 MAR 23 465 CALL	$20.90	0.4	$33.95	1,208	62.44%	$4,101,160
12/1/2022	IT	IT 100 17 MAR 23 340 CALL	$35	0.65	$21.30	1,899	39.14%	$4,044,870
11/30/2022	IT	IT 100 17 MAR 23 330 CALL	$33.05	0.63	$26	1,524	21.33%	$3,962,400
8/26/2022	CCJ	CCJ 100 17 MAR 23 15 CALL	$12.30	0.91	$6.83	5,457	44.47%	$3,727,131
12/7/2022	BAC	BAC 100 17 MAR 23 31 CALL	$3.55	0.65	$2.78	12,840	21.69%	$3,569,520
11/14/2022	KO	KO 100 17 MAR 23 65 CALL	$1.36	0.33	$1.49	23,347	9.56%	$3,478,703

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
9/29/2022	OXY	OXY 100 17 MAR 23 70 CALL	$5.65	0.43	$2.70	12,457	52.21%	$3,363,390
11/9/2022	XOM	XOM 100 17 MAR 23 115 CALL	$6.30	0.44	$2.72	12,088	56.83%	$3,287,936
9/27/2022	PDD	PDD 100 17 MAR 23 65 CALL	$10.60	0.56	$28.40	1,116	167.92%	$3,169,440
12/12/2022	EQT	EQT 100 17 MAR 23 40 CALL	$3.80	0.49	$2.55	12,370	32.89%	$3,154,350
11/8/2022	SBUX	SBUX 100 17 MAR 23 95 CALL	$6.60	0.49	$8.01	3,805	21.36%	$3,047,805
11/8/2022	CEIX	CEIX 100 17 MAR 23 59 CALL	$14.40	0.69	$14.79	2,000	2.71%	$2,958,000
10/12/2022	WFC	WFC 100 17 MAR 23 40 CALL	$4.95	0.59	$3.83	7,473	22.63%	$2,862,159
9/14/2022	AA	AA 100 17 MAR 23 50 CALL	$6.35	0.51	$2.25	11,678	64.57%	$2,627,550
11/17/2022	NEM	NEM 100 17 MAR 23 37.5 CALL	$8.35	0.78	$9.40	2,658	12.57%	$2,498,520
11/28/2022	HD	HD 100 17 MAR 23 325 CALL	$18.94	0.49	$16.02	1,475	15.42%	$2,362,950
11/7/2022	RKT	RKT 100 17 MAR 23 7 CALL	$0.67	0.47	$1.40	16,793	108.96%	$2,351,020
12/12/2022	V	V 100 17 MAR 23 220 CALL	$10.05	0.46	$5.55	4,166	44.78%	$2,312,130
9/15/2022	CSCO	CSCO 100 17 MAR 23 40 CALL	$6	0.67	$7.85	2,719	30.83%	$2,134,415
9/22/2022	AMD	AMD 100 17 MAR 23 80 CALL	$7.54	0.46	$1.88	11,226	75.07%	$2,110,488
6/21/2022	PINS	PINS 100 17 MAR 23 7.5 CALL	$11.84	0.93	$17.75	1,101	49.92%	$1,954,275
12/16/2022	TGT	TGT 100 17 MAR 23 135 CALL	$18.15	0.68	$18.15	1,070	0%	$1,942,050
12/14/2022	ATVI	ATVI 100 17 MAR 23 70 CALL	$10.10	0.75	$10.10	1,695	0%	$1,711,950
12/16/2022	SE	SE 100 17 MAR 23 65 CALL	$4.90	0.41	$3.90	4,334	20.41%	$1,690,260
9/28/2022	INTC	INTC 100 17 MAR 23 30 CALL	$1.74	0.39	$0.80	20,913	54.02%	$1,673,040
8/29/2022	DOW	DOW 100 17 MAR 23 50 CALL	$6.83	0.64	$2.57	6,383	62.37%	$1,640,431
12/5/2022	BABA	BABA 100 17 MAR 23 115 CALL	$4.05	0.27	$2.38	6,771	41.23%	$1,611,498
11/10/2022	X	X 100 17 MAR 23 24 CALL	$2.17	0.46	$3.07	5,119	41.47%	$1,571,533
10/13/2022	SCHW	SCHW 100 17 MAR 23 75 CALL	$7.15	0.53	$7.66	2,044	7.13%	$1,565,704
11/2/2022	PPC	PPC 100 17 MAR 23 25 CALL	$2.02	0.52	$0.85	18,331	57.92%	$1,558,135
11/23/2022	JD	JD 100 17 MAR 23 52.5 CALL	$6.98	0.57	$9.20	1,664	31.81%	$1,530,880
11/18/2022	CROX	CROX 100 17 MAR 23 115 CALL	$9.96	0.44	$6.20	2,368	37.75%	$1,468,160
11/3/2022	SQ	SQ 100 17 MAR 23 67.5 CALL	$4.60	0.37	$5.85	2,428	27.17%	$1,420,380
11/11/2022	SQ	SQ 100 17 MAR 23 77.5 CALL	$9.40	0.51	$3.20	4,275	65.96%	$1,368,000
11/22/2022	NEM	NEM 100 17 MAR 23 40 CALL	$7.25	0.76	$7.50	1,678	3.45%	$1,258,500
9/16/2022	TBPH	TBPH 100 17 MAR 23 7.5 CALL	$3.30	0.8	$4	3,052	21.21%	$1,220,800
12/14/2022	COIN	COIN 100 17 MAR 23 35 CALL	$11.80	0.71	$7.10	1,604	39.83%	$1,138,840
11/1/2022	C	C 100 17 MAR 23 40 CALL	$7.60	0.76	$5.15	2,182	32.24%	$1,123,730
12/13/2022	MSFT	MSFT 100 17 MAR 23 295 CALL	$3.95	0.2	$1.31	8,295	66.84%	$1,086,645
12/19/2022	DOCU	DOCU 100 17 MAR 23 57.5 CALL	$6.95	0.52	$7.10	1,504	2.16%	$1,067,840
12/5/2022	UNH	UNH 100 17 MAR 23 580 CALL	$11.90	0.3	$6.85	1,539	42.44%	$1,054,215
7/13/2022	SHOP	SHOP 100 17 MAR 23 35 CALL	$6	0.55	$5.40	1,918	10%	$1,035,720
11/22/2022	MP	MP 100 17 MAR 23 35 CALL	$4.22	0.53	$1.25	8,237	70.38%	$1,029,625
11/1/2022	GT	GT 100 17 MAR 23 12 CALL	$1.16	0.49	$0.40	25,225	65.52%	$1,009,000

Bearish: Put positions in March expiration are again led by mega-caps like **AAPL, META, AMD, TSLA** but also notable size put buys for **Ford (F), Zoom (ZM), Micron (MU), Coinbase (COIN), Roblox (RBLX), Trade Desk (TTD)** and **Zscaler (ZS).** Two payment leaders **PayPal (PYPL)** and **Block (SQ)** have large March bearish put open interest and **Blackstone (BX)** shows up yet again with size put buys. **Capital One (COF)** another payments name with size put buys. **Best Buy (BBY)** and **Burlington (BURL)** two large retailers with size puts bought in open interest for March.

Date	Ticker	Contract	Price	Delt	Last	Current O	Price %	Current Valu
11/23/2022	AAPL	AAPL 100 17 MAR 23 155 PUT	$12.05	-0.51	$23.70	31,539	96.68%	$74,747,430
9/22/2022	F	F 100 17 MAR 23 15 PUT	$3	-0.62	$3.55	74,688	18.33%	$26,514,240
4/15/2021	AAPL	AAPL 100 17 MAR 23 145 PUT	$30.15	-0.49	$16.10	15,617	46.60%	$25,143,370
6/10/2022	META	META 100 17 MAR 23 150 PUT	$16.40	-0.28	$36.67	6,592	123.60%	$24,172,864
10/3/2022	F	F 100 17 MAR 23 16 PUT	$4.92	-0.78	$4.35	46,845	11.59%	$20,377,575
11/28/2022	ZM	ZM 100 17 MAR 23 75 PUT	$9.38	-0.43	$11.20	17,337	19.40%	$19,417,440
8/15/2022	BAC	BAC 100 17 MAR 23 35 PUT	$2.74	-0.39	$3.65	36,060	33.21%	$13,161,900
9/2/2022	AMD	AMD 100 17 MAR 23 70 PUT	$7.12	-0.29	$9.55	12,465	34.13%	$11,904,075
10/4/2022	F	F 100 17 MAR 23 14 PUT	$2.81	-0.6	$2.69	44,127	4.27%	$11,870,163
10/13/2022	F	F 100 17 MAR 23 13 PUT	$2.39	-0.55	$1.81	62,930	24.27%	$11,390,330
12/13/2022	TSLA	TSLA 100 17 MAR 23 140 PUT	$11.46	-0.28	$14.10	7,515	23.04%	$10,596,150
11/2/2022	MU	MU 100 17 MAR 23 50 PUT	$3.80	-0.32	$3.75	27,199	1.32%	$10,199,625
12/13/2022	COIN	COIN 100 17 MAR 23 45 PUT	$11.95	-0.49	$14	7,074	17.15%	$9,903,600
11/17/2022	WMT	WMT 100 17 MAR 23 150 PUT	$8.40	-0.5	$9.95	9,568	18.45%	$9,520,160
7/22/2022	AMD	AMD 100 17 MAR 23 85 PUT	$11.95	-0.38	$21.20	4,423	77.41%	$9,376,760
11/18/2021	BABA	BABA 100 17 MAR 23 100 PUT	$11.55	-0.17	$17.20	5,449	48.92%	$9,372,280
8/12/2022	WFC	WFC 100 17 MAR 23 45 PUT	$4.05	-0.44	$4.56	20,306	12.59%	$9,259,536
6/9/2022	CCL	CCL 100 17 MAR 23 10 PUT	$1.81	-0.28	$2.41	38,169	33.15%	$9,198,729
10/26/2022	AMZN	AMZN 100 17 MAR 23 80 PUT	$1.92	-0.09	$5.20	15,914	170.83%	$8,275,280
8/17/2022	PLUG	PLUG 100 17 MAR 23 25 PUT	$4.50	-0.31	$9.95	8,253	121.11%	$8,211,735
8/19/2022	C	C 100 17 MAR 23 52.5 PUT	$4.77	-0.46	$9.10	8,922	90.78%	$8,119,020
9/15/2022	META	META 100 17 MAR 23 140 PUT	$14.75	-0.35	$27.07	2,964	83.53%	$8,023,548
10/19/2022	NFLX	NFLX 100 17 MAR 23 250 PUT	$26.83	-0.32	$13.83	5,755	48.45%	$7,959,165
9/13/2022	RBLX	RBLX 100 17 MAR 23 40 PUT	$7.35	-0.33	$13.25	5,599	80.27%	$7,418,675
11/23/2021	BABA	BABA 100 17 MAR 23 110 PUT	$16.39	-0.25	$25	2,845	52.53%	$7,112,500
11/22/2022	MU	MU 100 17 MAR 23 55 PUT	$4.30	-0.37	$6.35	10,894	47.67%	$6,917,690
10/7/2022	ZS	ZS 100 17 MAR 23 170 PUT	$26.80	-0.41	$49.20	1,251	83.58%	$6,154,920
10/14/2022	ALB	ALB 100 17 MAR 23 250 PUT	$39	-1	$30.20	2,018	22.56%	$6,094,360
9/29/2022	CCL	CCL 100 17 MAR 23 11 PUT	$2.94	-0.52	$3.25	17,740	10.54%	$5,765,500
10/17/2022	ATVI	ATVI 100 17 MAR 23 70 PUT	$6	-0.4	$1.94	29,426	67.67%	$5,708,644
2/3/2022	PLTR	PLTR 100 17 MAR 23 12 PUT	$2.80	-0.33	$5.50	10,235	96.43%	$5,629,250
12/12/2022	SQ	SQ 100 17 MAR 23 55 PUT	$4.80	-0.25	$5.70	9,663	18.75%	$5,507,910
9/2/2022	TTD	TTD 100 17 MAR 23 55 PUT	$8.94	-0.31	$11.17	4,751	24.94%	$5,306,867
11/9/2022	DIS	DIS 100 17 MAR 23 90 PUT	$8.45	-0.48	$8.32	6,334	1.54%	$5,269,888
10/13/2022	F	F 100 17 MAR 23 12 PUT	$1.84	-0.46	$1.16	44,397	36.96%	$5,150,052
12/14/2022	GME	GME 100 17 MAR 23 21 PUT	$4.40	-0.35	$5.07	10,082	15.23%	$5,111,574
12/7/2022	BX	BX 100 17 MAR 23 75 PUT	$7.15	-0.39	$8.20	6,099	14.69%	$5,001,180
8/8/2022	WFC	WFC 100 17 MAR 23 42.5 PUT	$3.80	-0.42	$2.90	15,936	23.68%	$4,621,440
10/7/2022	SNAP	SNAP 100 17 MAR 23 10 PUT	$1.86	-0.34	$2.49	18,298	33.87%	$4,556,202
11/28/2022	ZM	ZM 100 17 MAR 23 80 PUT	$12.08	-0.52	$14.20	3,187	17.55%	$4,525,540
8/16/2022	PLUG	PLUG 100 17 MAR 23 27.5 PUT	$5.25	-0.33	$13.50	3,168	157.14%	$4,276,800
11/15/2022	JPM	JPM 100 17 MAR 23 135 PUT	$9.35	-0.5	$9.60	4,432	2.67%	$4,254,720

Date	Ticker	Contract	Price	Delt	Last	Current Ot	Price %	Current Valu
9/22/2022	SIMO	SIMO 100 17 MAR 23 65 PUT	$2.65	-0.29	$8.60	4,945	224.53%	$4,252,700
11/1/2022	WBD	WBD 100 17 MAR 23 17.5 PUT	$4.54	-0.72	$8	5,309	76.21%	$4,247,200
9/26/2022	CRWD	CRWD 100 17 MAR 23 145 PUT	$17.25	-0.32	$37.10	1,129	115.07%	$4,188,590
11/11/2022	PYPL	PYPL 100 17 MAR 23 85 PUT	$7.90	-0.35	$17.01	2,458	115.32%	$4,181,058
12/15/2022	VSTO	VSTO 100 17 MAR 23 30 PUT	$5.57	-0.8	$6.45	6,300	15.80%	$4,063,500
12/5/2022	BX	BX 100 17 MAR 23 80 PUT	$6.85	-0.38	$11	3,691	60.58%	$4,060,100
8/25/2022	DASH	DASH 100 17 MAR 23 60 PUT	$10.34	-0.33	$11.25	3,594	8.80%	$4,043,250
10/20/2022	T	T 100 17 MAR 23 17 PUT	$1.16	-0.49	$0.56	70,165	51.72%	$3,929,240
11/10/2022	IAC	IAC 100 17 MAR 23 45 PUT	$4.90	-0.36	$5.20	7,255	6.12%	$3,772,600
10/11/2022	PYPL	PYPL 100 17 MAR 23 80 PUT	$9.23	-0.36	$13.50	2,703	46.26%	$3,649,050
12/1/2022	BYND	BYND 100 17 MAR 23 10 PUT	$1.84	-0.2	$1.83	19,119	0.54%	$3,498,777
8/19/2022	BX	BX 100 17 MAR 23 90 PUT	$7.10	-0.28	$18.55	1,881	161.27%	$3,489,255
11/28/2022	BURL	BURL 100 17 MAR 23 150 PUT	$7.34	-0.17	$6.10	5,678	16.89%	$3,463,580
11/9/2022	MARA	MARA 100 17 MAR 23 5 PUT	$1.01	-0.11	$1.83	17,957	81.19%	$3,286,131
9/16/2022	RCL	RCL 100 17 MAR 23 50 PUT	$8.40	-0.4	$5.21	6,268	37.98%	$3,265,628
10/7/2022	SQ	SQ 100 17 MAR 23 57.5 PUT	$10.50	-0.4	$6.85	4,724	34.76%	$3,235,940
11/15/2022	COF	COF 100 17 MAR 23 100 PUT	$6.63	-0.35	$14.90	2,141	124.74%	$3,190,090
9/22/2022	IAC	IAC 100 17 MAR 23 55 PUT	$7.88	-0.41	$8.60	3,555	9.14%	$3,057,300
9/13/2022	SIRI	SIRI 100 17 MAR 23 8 PUT	$2.39	-0.67	$2.22	13,531	7.11%	$3,003,882
11/4/2022	OXY	OXY 100 17 MAR 23 72.5 PUT	$7.95	-0.41	$12.25	2,439	54.09%	$2,987,775
11/22/2022	PYPL	PYPL 100 17 MAR 23 75 PUT	$7.25	-0.38	$10.14	2,925	39.86%	$2,965,950
12/5/2022	BBY	BBY 100 17 MAR 23 72.5 PUT	$3.15	-0.23	$3.50	8,434	11.11%	$2,951,900
12/7/2022	RCL	RCL 100 17 MAR 23 40 PUT	$1.63	-0.13	$1.96	15,022	20.25%	$2,944,312
12/7/2022	HUBS	HUBS 100 17 MAR 23 270 PUT	$35.04	-0.41	$26.10	1,122	25.51%	$2,928,420
12/1/2022	W	W 100 17 MAR 23 30 PUT	$3.70	-0.2	$4.74	6,163	28.11%	$2,921,262
10/27/2022	AEHR	AEHR 100 17 MAR 23 35 PUT	$15.60	-0.68	$11	2,639	29.49%	$2,902,900
11/14/2022	OXY	OXY 100 17 MAR 23 75 PUT	$8.40	-0.46	$14.25	2,034	69.64%	$2,898,450
10/31/2022	FSLR	FSLR 100 17 MAR 23 140 PUT	$14.35	-0.39	$7.77	3,699	45.85%	$2,874,123
8/8/2022	MS	MS 100 17 MAR 23 85 PUT	$7.40	-0.43	$5.10	5,628	31.08%	$2,870,280
11/21/2022	GOOG	GOOG 100 17 MAR 23 99 PUT	$8.40	-0.51	$10.87	2,633	29.40%	$2,862,071
11/1/2022	AMZN	AMZN 100 17 MAR 23 96 PUT	$8.95	-0.41	$13.75	2,037	53.63%	$2,800,875
12/5/2022	DE	DE 100 17 MAR 23 390 PUT	$11.25	-0.23	$11.20	2,462	0.44%	$2,757,440
8/24/2022	IAC	IAC 100 17 MAR 23 65 PUT	$8.02	-0.4	$17.60	1,556	119.45%	$2,738,560
11/22/2022	JPM	JPM 100 17 MAR 23 130 PUT	$6.14	-0.38	$7.10	3,842	15.64%	$2,727,820
9/22/2022	SNOW	SNOW 100 17 MAR 23 150 PUT	$19.50	-0.29	$24.30	1,058	24.62%	$2,570,940
8/17/2022	BA	BA 100 17 MAR 23 195 PUT	$35.79	-0.66	$18.70	1,369	47.75%	$2,560,030
11/15/2022	NKE	NKE 100 17 MAR 23 110 PUT	$10.60	-0.5	$11.45	2,222	8.02%	$2,544,190
9/21/2022	DOCU	DOCU 100 17 MAR 23 57.5 PUT	$11.09	-0.43	$9.15	2,687	17.49%	$2,458,605
10/11/2022	SQ	SQ 100 17 MAR 23 47.5 PUT	$6.65	-0.28	$3.17	7,713	52.33%	$2,445,021
8/29/2022	BBY	BBY 100 17 MAR 23 80 PUT	$13.35	-0.54	$6.55	3,729	50.94%	$2,442,495
9/16/2022	ROKU	ROKU 100 17 MAR 23 60 PUT	$9.25	-0.27	$16.57	1,433	79.14%	$2,374,481
12/15/2022	COF	COF 100 17 MAR 23 85 PUT	$4.10	-0.28	$5.95	3,948	45.12%	$2,349,060

Date	Ticker	Contract	Price	Delt	Last	Current C	Price %	Current Valu
6/30/2022	QCOM	QCOM 100 17 MAR 23 100 PUT	$7.30	-0.21	$4.47	5,198	38.77%	$2,323,506
11/8/2022	UPST	UPST 100 17 MAR 23 15 PUT	$3.13	-0.23	$3.67	6,160	17.25%	$2,260,720
8/19/2022	AA	AA 100 17 MAR 23 45 PUT	$5.35	-0.29	$6.35	3,551	18.69%	$2,254,885
10/25/2022	JPM	JPM 100 17 MAR 23 125 PUT	$10.55	-0.5	$5.13	4,389	51.37%	$2,251,557
11/18/2022	CROX	CROX 100 17 MAR 23 105 PUT	$16.60	-0.45	$17.70	1,249	6.63%	$2,210,730
11/15/2022	SE	SE 100 17 MAR 23 50 PUT	$5	-0.23	$6.35	3,452	27%	$2,192,020
12/13/2022	SPWR	SPWR 100 17 MAR 23 22 PUT	$2.59	-0.4	$3.50	6,213	35.14%	$2,174,550
9/23/2022	SQ	SQ 100 17 MAR 23 52.5 PUT	$9.35	-0.35	$4.55	4,731	51.34%	$2,152,605
6/23/2022	MSFT	MSFT 100 17 MAR 23 205 PUT	$8.82	-0.18	$4.30	4,888	51.25%	$2,101,840
9/28/2022	TGT	TGT 100 17 MAR 23 150 PUT	$13.70	-0.39	$13.50	1,537	1.46%	$2,074,950
11/17/2022	XPEV	XPEV 100 17 MAR 23 10 PUT	$3.20	-0.53	$2.03	10,195	36.56%	$2,069,585
9/29/2022	SQ	SQ 100 17 MAR 23 50 PUT	$8.10	-0.31	$3.96	5,217	51.11%	$2,065,932
11/29/2022	BKI	BKI 100 17 MAR 23 55 PUT	$4.20	-0.29	$4.10	5,001	2.38%	$2,050,410
8/2/2022	GOOGL	GOOGL 100 17 MAR 23 114 PUT	$10.65	-0.43	$18.90	1,067	77.46%	$2,016,630
7/26/2022	GOOGL	GOOGL 100 17 MAR 23 92.5 PUT	$6.10	-0.27	$7.50	2,681	22.95%	$2,010,750
10/21/2022	ALB	ALB 100 17 MAR 23 220 PUT	$14.90	-0.22	$15.30	1,309	2.68%	$2,002,770
11/2/2022	GM	GM 100 17 MAR 23 34 PUT	$2	-0.27	$2.03	9,708	1.50%	$1,970,724
6/14/2022	NIO	NIO 100 17 MAR 23 22.5 PUT	$7	-0.47	$9.96	1,926	42.29%	$1,918,296
8/16/2022	BA	BA 100 17 MAR 23 165 PUT	$16.15	-0.37	$6.35	2,911	60.68%	$1,848,485
11/3/2022	UNH	UNH 100 17 MAR 23 500 PUT	$16.10	-0.26	$15.66	1,174	2.73%	$1,838,484
12/16/2022	MRNA	MRNA 100 17 MAR 23 165 PUT	$10.65	-0.24	$11.10	1,656	4.23%	$1,838,160
11/10/2022	MCD	MCD 100 17 MAR 23 260 PUT	$7.80	-0.3	$7.55	2,418	3.21%	$1,825,590
9/9/2022	CS	CS 100 17 MAR 23 5 PUT	$0.52	-0.33	$1.90	8,581	265.38%	$1,630,390
9/23/2022	DKNG	DKNG 100 17 MAR 23 12.5 PUT	$1.94	-0.27	$2.17	7,500	11.86%	$1,627,500
12/15/2022	PLUG	PLUG 100 17 MAR 23 10 PUT	$0.56	-0.14	$0.78	20,716	39.29%	$1,615,848
8/23/2022	AMAT	AMAT 100 17 MAR 23 110 PUT	$16.85	-0.52	$11.50	1,399	31.75%	$1,608,850
12/9/2022	W	W 100 17 MAR 23 45 PUT	$12.40	-0.52	$13.77	1,135	11.05%	$1,562,895
11/29/2022	SBUX	SBUX 100 17 MAR 23 95 PUT	$4.84	-0.37	$4.40	3,477	9.09%	$1,529,880
12/16/2022	AMZN	AMZN 100 17 MAR 23 73 PUT	$2.59	-0.19	$2.97	5,146	14.67%	$1,528,362
10/19/2022	CRK	CRK 100 17 MAR 23 16 PUT	$2.40	-0.3	$2.70	5,565	12.50%	$1,502,550
11/2/2022	MDB	MDB 100 17 MAR 23 150 PUT	$21.20	-0.31	$10.90	1,366	48.58%	$1,488,940
9/20/2022	CIM	CIM 100 17 MAR 23 6 PUT	$0.37	-0.22	$0.60	24,807	62.16%	$1,488,420
8/4/2022	ADI	ADI 100 17 MAR 23 170 PUT	$13.44	-0.38	$12.80	1,162	4.76%	$1,487,360
10/20/2022	NFLX	NFLX 100 17 MAR 23 245 PUT	$24.70	-0.32	$12.30	1,188	50.20%	$1,461,240
9/30/2022	DIS	DIS 100 17 MAR 23 75 PUT	$2.98	-0.17	$2.51	5,751	15.77%	$1,443,501
11/30/2022	UPST	UPST 100 17 MAR 23 10 PUT	$1.11	-0.12	$1.17	12,304	5.41%	$1,439,568
11/9/2022	HOOD	HOOD 100 17 MAR 23 10 PUT	$2.56	-0.53	$2.37	5,899	7.42%	$1,398,063
12/14/2022	NVAX	NVAX 100 17 MAR 23 22.5 PUT	$7.70	-0.5	$12	1,150	55.84%	$1,380,000
12/12/2022	URBN	URBN 100 17 MAR 23 23 PUT	$1.19	-0.22	$1.18	11,575	0.84%	$1,365,850
8/25/2022	WMT	WMT 100 17 MAR 23 130 PUT	$6.44	-0.36	$2.20	6,011	65.84%	$1,322,420
11/15/2022	JD	JD 100 17 MAR 23 45 PUT	$3.46	-0.23	$1.73	7,396	50%	$1,279,508
9/28/2022	DISH	DISH 100 17 MAR 23 10 PUT	$0.87	-0.15	$0.45	28,129	48.28%	$1,265,805

April 2023

Bullish: In April expiration we see some large ITM call positions in Software names **Nutanix (NTNX), Ring Central (RNG), Shopify (SHOP),** and **Five9 (FIVN)**, potential buyout targets in a hot M&A industry. **Novartis (NVS)** a Pharma with unusual size in ITM call open interest while **Royal Dutch Shell (SHEL)** has massive bullish positioning. **Liberty (LBTYA)** has 25,000 April $20 calls accumulated from buyers as an unusual one along with 30,000 of the $22.50 calls and **Fidelity Info (FIS)** April $70 calls as a name looking at strategic alternatives. **Valvoline (VVV)** a smaller name in the midst of a transformation with an unusually large call buy in open interest as well. A few more unusual ones are the **Weyerhaeuser (WY)** April $34 calls, **Laredo Petro (LPI)** April $80 calls and **Constellation (STZ)** April $265 calls. **United Parcel (UPS)** has two notable large call buys in open interest.

Date	Ticker	Contract	Price	Delt	Last	Current O	Price %	Current Valu
8/29/2022	NTNX	NTNX 100 21 APR 23 20 CALL	$2.80	0.52	$13	14,141	364.29%	$18,383,300
9/28/2022	NVS	NVS 100 21 APR 23 70 CALL	$9.70	0.68	$23.20	5,474	139.18%	$12,699,680
11/16/2022	RNG	RNG 100 21 APR 23 30 CALL	$12.33	0.78	$12.20	10,293	1.05%	$12,557,460
11/10/2022	RNG	RNG 100 21 APR 23 30 CALL	$11.20	0.75	$12.20	10,293	8.93%	$12,557,460
11/15/2022	SHOP	SHOP 100 21 APR 23 25 CALL	$18.20	0.89	$12.50	6,194	31.32%	$7,742,500
10/7/2022	SHOP	SHOP 100 21 APR 23 25 CALL	$7.30	0.68	$12.50	6,194	71.23%	$7,742,500
11/9/2022	FIVN	FIVN 100 21 APR 23 60 CALL	$6.60	0.48	$14.25	5,123	115.91%	$7,300,275
9/6/2022	NVDA	NVDA 100 21 APR 23 150 CALL	$17.10	0.5	$28.03	1,983	63.92%	$5,558,349
12/2/2022	JCI	JCI 100 21 APR 23 62.5 CALL	$8.56	0.73	$5.06	10,899	40.89%	$5,514,894
10/28/2022	SHEL	SHEL 100 21 APR 23 57.5 CALL	$4.40	0.5	$2.96	16,382	32.73%	$4,849,072
10/14/2022	NKE	NKE 100 21 APR 23 95 CALL	$8.05	0.47	$17.10	2,810	112.42%	$4,805,100
11/29/2022	SHEL	SHEL 100 21 APR 23 60 CALL	$3.55	0.46	$2.07	23,106	41.69%	$4,782,942
11/28/2022	SHEL	SHEL 100 21 APR 23 60 CALL	$3.03	0.42	$2.07	23,106	31.68%	$4,782,942
11/17/2022	PDD	PDD 100 21 APR 23 70 CALL	$14.45	0.62	$23.30	1,985	61.25%	$4,625,050
10/13/2022	SHOP	SHOP 100 21 APR 23 20 CALL	$8.30	0.76	$15.50	2,785	86.75%	$4,316,750
9/13/2022	NVDA	NVDA 100 21 APR 23 160 CALL	$12.90	0.41	$22.50	1,794	74.42%	$4,036,500
9/28/2022	NVS	NVS 100 21 APR 23 72.5 CALL	$7.60	0.62	$19.40	1,821	155.26%	$3,532,740
9/26/2022	MS	MS 100 21 APR 23 65 CALL	$17.95	0.76	$23.65	1,462	31.75%	$3,457,630
11/9/2022	STNG	STNG 100 21 APR 23 45 CALL	$11.20	0.69	$14.02	2,463	25.18%	$3,453,126
11/28/2022	PDD	PDD 100 21 APR 23 80 CALL	$10.80	0.53	$17.85	1,885	65.28%	$3,364,725
10/13/2022	CMCSA	CMCSA 100 21 APR 23 35 CALL	$1.58	0.33	$2.16	15,242	36.71%	$3,292,272
10/31/2022	PERI	PERI 100 21 APR 23 25 CALL	$3.24	0.53	$3.50	8,381	8.02%	$2,933,350
10/12/2022	AMD	AMD 100 21 APR 23 65 CALL	$7.25	0.48	$8.03	3,630	10.76%	$2,914,890
9/6/2022	KHC	KHC 100 21 APR 23 37.5 CALL	$2.96	0.51	$3.90	7,022	31.76%	$2,738,580
8/25/2022	XOM	XOM 100 21 APR 23 120 CALL	$4.23	0.28	$2.59	10,556	38.77%	$2,734,004
12/14/2022	IBM	IBM 100 21 APR 23 135 CALL	$18.40	0.73	$9.95	2,518	45.92%	$2,505,410
12/6/2022	LBTYA	LBTYA 100 21 APR 23 20 CALL	$1.29	0.46	$0.95	25,573	26.36%	$2,429,435
12/8/2022	TJX	TJX 100 21 APR 23 77.5 CALL	$6.70	0.58	$6	3,931	10.45%	$2,358,600
11/28/2022	FIS	FIS 100 21 APR 23 70 CALL	$4.30	0.44	$7.50	3,089	74.42%	$2,316,750
10/27/2022	VVV	VVV 100 21 APR 23 35 CALL	$1.15	0.27	$0.77	27,658	33.04%	$2,129,666
12/1/2022	MSFT	MSFT 100 21 APR 23 260 CALL	$16.34	0.49	$10.07	1,998	38.37%	$2,011,986
11/7/2022	CHWY	CHWY 100 21 APR 23 40 CALL	$4.60	0.45	$7.45	2,632	61.96%	$1,960,840
9/27/2022	SHOP	SHOP 100 21 APR 23 30 CALL	$5.62	0.58	$9.10	2,136	61.92%	$1,943,760
10/3/2022	NKE	NKE 100 21 APR 23 97.5 CALL	$5.15	0.37	$13.10	1,425	154.37%	$1,866,750
11/10/2022	RNG	RNG 100 21 APR 23 50 CALL	$3.70	0.37	$3.35	5,371	9.46%	$1,799,285
10/14/2022	AMD	AMD 100 21 APR 23 75 CALL	$4	0.33	$3.95	4,203	1.25%	$1,660,185
9/29/2022	AMD	AMD 100 21 APR 23 80 CALL	$5.65	0.38	$2.73	5,991	51.68%	$1,635,543
12/2/2022	LOW	LOW 100 21 APR 23 210 CALL	$21.54	0.59	$12.45	1,288	42.20%	$1,603,560

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
10/28/2022	GOOG	GOOG 100 21 APR 23 100 CALL	$8.65	0.52	$3.54	4,492	59.08%	$1,590,168
11/30/2022	GRAB	GRAB 100 21 APR 23 2.5 CALL	$0.90	0.73	$1.04	15,198	15.56%	$1,580,592
10/3/2022	LBTYK	LBTYK 100 21 APR 23 20 CALL	$1.10	0.36	$1.40	10,718	27.27%	$1,500,520
11/9/2022	STZ	STZ 100 21 APR 23 265 CALL	$8.30	0.33	$3.90	3,721	53.01%	$1,451,190
11/8/2022	STZ	STZ 100 21 APR 23 265 CALL	$10.07	0.35	$3.90	3,721	61.27%	$1,451,190
12/6/2022	UPS	UPS 100 21 APR 23 190 CALL	$6.85	0.35	$7.30	1,941	6.57%	$1,416,930
12/15/2022	CVNA	CVNA 100 21 APR 23 7.5 CALL	$1.65	0.58	$1.13	12,489	31.52%	$1,411,257
12/5/2022	SHEL	SHEL 100 21 APR 23 62.5 CALL	$2.55	0.37	$1.50	8,856	41.18%	$1,328,400
10/14/2022	ELAN	ELAN 100 21 APR 23 13 CALL	$1.45	0.49	$0.95	13,888	34.48%	$1,319,360
12/16/2022	RYTM	RYTM 100 21 APR 23 30 CALL	$5.05	0.56	$4.30	3,021	14.85%	$1,299,030
11/21/2022	MPC	MPC 100 21 APR 23 120 CALL	$12.45	0.55	$6.66	1,875	46.51%	$1,248,750
9/26/2022	AMT	AMT 100 21 APR 23 230 CALL	$16.20	0.46	$8.35	1,430	48.46%	$1,194,050
11/10/2022	CCK	CCK 100 21 APR 23 75 CALL	$9.20	0.6	$11.70	1,015	27.17%	$1,187,550
10/25/2022	RNW	RNW 100 21 APR 23 6 CALL	$0.80	0.51	$0.78	15,026	2.50%	$1,172,028
11/10/2022	UPS	UPS 100 21 APR 23 185 CALL	$7.80	0.37	$9.66	1,156	23.85%	$1,116,696
11/30/2022	LBTYA	LBTYA 100 21 APR 23 22.5 CALL	$0.74	0.32	$0.35	30,521	52.70%	$1,068,235
9/26/2022	LYV	LYV 100 21 APR 23 75 CALL	$11.20	0.57	$4.99	2,058	55.45%	$1,026,942
11/21/2022	TSM	TSM 100 21 APR 23 85 CALL	$5.70	0.45	$2.90	3,415	49.12%	$990,350
12/1/2022	WY	WY 100 21 APR 23 34 CALL	$1.42	0.41	$0.70	13,873	50.70%	$971,110
11/1/2022	MPW	MPW 100 21 APR 23 14 CALL	$0.70	0.32	$0.74	12,934	5.71%	$957,116
12/2/2022	LPI	LPI 100 21 APR 23 80 CALL	$5.40	0.37	$2	4,705	62.96%	$941,000
12/1/2022	LPI	LPI 100 21 APR 23 80 CALL	$6.10	0.39	$2	4,705	67.21%	$941,000
10/25/2022	MSFT	MSFT 100 21 APR 23 280 CALL	$12	0.36	$4.71	1,966	60.75%	$925,986
11/16/2022	TWLO	TWLO 100 21 APR 23 55 CALL	$7.91	0.54	$4.70	1,955	40.58%	$918,850
12/5/2022	ROK	ROK 100 21 APR 23 290 CALL	$11.40	0.33	$7.20	1,268	36.84%	$912,960
11/22/2022	ONON	ONON 100 21 APR 23 20 CALL	$2.05	0.47	$1.20	7,572	41.46%	$908,640
11/10/2022	RNG	RNG 100 21 APR 23 45 CALL	$4.30	0.43	$3.10	2,633	27.91%	$816,230
11/23/2022	STNE	STNE 100 21 APR 23 13 CALL	$1.30	0.44	$0.65	10,848	50%	$705,120
10/12/2022	VOD	VOD 100 21 APR 23 11 CALL	$1.19	0.52	$0.46	13,790	61.34%	$634,340
9/26/2022	TTWO	TTWO 100 21 APR 23 130 CALL	$6.35	0.34	$1.97	3,035	68.98%	$597,895
12/1/2022	FTCH	FTCH 100 21 APR 23 5 CALL	$1.62	0.69	$0.60	9,177	62.96%	$550,620
11/11/2022	AMAT	AMAT 100 21 APR 23 135 CALL	$5.20	0.3	$1.89	2,859	63.65%	$540,351
9/23/2022	AMT	AMT 100 21 APR 23 250 CALL	$11.50	0.39	$3.45	1,467	70%	$506,115

Bearish: **Advanced Micro (AMD)** with a lot of put buys in the $65 and $60 strike in April and **Trade Desk (TTD)** in the $60 and $55 puts. **Marriott (MAR)** and **Hilton (HLT)** saw large April put buys recently. **Danaher (DHR), ON Semi (ON), Micron (MU),** and **Comcast (CMCSA)** a few large caps with large April puts bought in OI.

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
11/2/2022	AAPL	AAPL 100 21 APR 23 135 PUT	$7.15	-0.28	$11.20	66,326	56.64%	$74,285,120
11/11/2022	TSLA	TSLA 100 21 APR 23 150 PUT	$13.50	-0.21	$21.55	12,003	59.63%	$25,866,465
10/27/2022	NVAX	NVAX 100 21 APR 23 40 PUT	$20.20	-0.55	$29.92	6,767	48.12%	$20,246,864
9/14/2022	AAPL	AAPL 100 21 APR 23 145 PUT	$10.20	-0.33	$17.30	8,860	69.61%	$15,327,800
10/14/2022	NKLA	NKLA 100 21 APR 23 3 PUT	$1.01	-0.33	$1.30	105,817	28.71%	$13,756,210
11/8/2022	HAS	HAS 100 21 APR 23 55 PUT	$2.85	-0.26	$4.17	30,252	46.32%	$12,615,084
9/12/2022	AAPL	AAPL 100 21 APR 23 155 PUT	$11.57	-0.37	$24.60	4,932	112.62%	$12,132,720
10/28/2022	AMZN	AMZN 100 21 APR 23 90 PUT	$6.65	-0.29	$10.80	10,007	62.41%	$10,807,560
9/14/2022	AAPL	AAPL 100 21 APR 23 150 PUT	$11.76	-0.37	$20.32	4,781	72.79%	$9,714,992
11/2/2022	AMZN	AMZN 100 21 APR 23 85 PUT	$6.20	-0.29	$8.15	9,697	31.45%	$7,903,055
6/28/2022	NVCR	NVCR 100 21 APR 23 100 PUT	$44.70	-0.43	$39.70	1,695	11.19%	$6,729,150
10/7/2022	AMD	AMD 100 21 APR 23 60 PUT	$8.77	-0.39	$5.36	10,360	38.88%	$5,552,960
9/20/2022	AMD	AMD 100 21 APR 23 65 PUT	$6.50	-0.28	$7.43	6,425	14.31%	$4,773,775
10/5/2022	TTD	TTD 100 21 APR 23 60 PUT	$11.80	-0.39	$16.40	2,588	38.98%	$4,244,320
9/29/2022	TTD	TTD 100 21 APR 23 60 PUT	$12.40	-0.38	$16.40	2,588	32.26%	$4,244,320
12/2/2022	MPW	MPW 100 21 APR 23 11 PUT	$0.95	-0.25	$1.93	19,464	103.16%	$3,756,552
11/2/2022	MAR	MAR 100 21 APR 23 155 PUT	$13.50	-0.42	$13.40	2,648	0.74%	$3,548,320
8/26/2022	AAPL	AAPL 100 21 APR 23 120 PUT	$3.49	-0.12	$5.70	5,681	63.32%	$3,238,170
11/23/2022	BAC	BAC 100 21 APR 23 38 PUT	$2.89	-0.48	$6.32	4,812	118.69%	$3,041,184
9/20/2022	TTD	TTD 100 21 APR 23 55 PUT	$8.80	-0.31	$13.25	2,217	50.57%	$2,937,525
11/22/2022	NKLA	NKLA 100 21 APR 23 2 PUT	$0.60	-0.27	$0.62	45,988	3.33%	$2,851,256
11/22/2022	TTCF	TTCF 100 21 APR 23 5 PUT	$3.27	-0.55	$3.72	7,598	13.76%	$2,826,456
10/25/2022	DVN	DVN 100 21 APR 23 60 PUT	$5.07	-0.23	$7.30	3,751	43.98%	$2,738,230
12/16/2022	ZIM	ZIM 100 21 APR 23 15 PUT	$2.95	-0.35	$3.10	8,027	5.08%	$2,488,370
8/24/2022	MAR	MAR 100 21 APR 23 145 PUT	$10.50	-0.3	$8.80	2,794	16.19%	$2,458,720
9/1/2022	NVDA	NVDA 100 21 APR 23 120 PUT	$14.20	-0.29	$4.99	4,924	64.86%	$2,457,076
10/28/2022	NVAX	NVAX 100 21 APR 23 30 PUT	$12.20	-0.45	$18.65	1,221	52.87%	$2,277,165
11/14/2022	SHOP	SHOP 100 21 APR 23 55 PUT	$17.95	-0.71	$19.92	1,119	10.97%	$2,229,048
12/12/2022	DHR	DHR 100 21 APR 23 270 PUT	$17.45	-0.43	$22	1,011	26.07%	$2,224,200
9/2/2022	NVDA	NVDA 100 21 APR 23 135 PUT	$20.62	-0.4	$8.43	2,490	59.12%	$2,099,070
11/16/2022	TTCF	TTCF 100 21 APR 23 2.5 PUT	$0.60	-0.34	$1.33	15,051	121.67%	$2,001,783
12/8/2022	MU	MU 100 21 APR 23 50 PUT	$3.60	-0.3	$4.53	4,280	25.83%	$1,938,840
9/20/2022	ON	ON 100 21 APR 23 65 PUT	$8.90	-0.36	$8.08	2,362	9.21%	$1,908,496
9/19/2022	CMCSA	CMCSA 100 21 APR 23 32.5 PUT	$2.90	-0.37	$1.96	9,568	32.41%	$1,875,328
9/15/2022	CMCSA	CMCSA 100 21 APR 23 32.5 PUT	$2.99	-0.38	$1.96	9,568	34.45%	$1,875,328
11/28/2022	DEN	DEN 100 21 APR 23 85 PUT	$8.50	-0.38	$9.51	1,964	11.88%	$1,867,764
9/2/2022	NVDA	NVDA 100 21 APR 23 130 PUT	$18	-0.36	$7.27	2,480	59.61%	$1,802,960
8/8/2022	MU	MU 100 21 APR 23 60 PUT	$7.75	-0.39	$10.45	1,689	34.84%	$1,765,005
12/15/2022	SPCE	SPCE 100 21 APR 23 5 PUT	$1.43	-0.48	$1.69	9,500	18.18%	$1,605,500
10/21/2022	ON	ON 100 21 APR 23 60 PUT	$8.10	-0.35	$5.70	2,613	29.63%	$1,489,410
12/2/2022	LOW	LOW 100 21 APR 23 200 PUT	$10	-0.32	$12.76	1,163	27.60%	$1,483,988
9/21/2022	MU	MU 100 21 APR 23 62.5 PUT	$13.55	-0.66	$10.05	1,469	25.83%	$1,476,345

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
12/6/2022	UPS	UPS 100 21 APR 23 175 PUT	$12.63	-0.46	$10.70	1,360	15.28%	$1,455,200
11/7/2022	INVH	INVH 100 21 APR 23 30 PUT	$2.40	-0.4	$2.27	6,160	5.42%	$1,398,320
8/18/2022	TSM	TSM 100 21 APR 23 90 PUT	$9.65	-0.45	$11.45	1,215	18.65%	$1,391,175
12/5/2022	JPM	JPM 100 21 APR 23 120 PUT	$5.05	-0.28	$5.10	2,411	0.99%	$1,229,610
12/2/2022	FTCH	FTCH 100 21 APR 23 11 PUT	$5.55	-0.69	$5.50	2,051	0.90%	$1,128,050
11/11/2022	DLR	DLR 100 21 APR 23 85 PUT	$2.30	-0.13	$3.35	3,352	45.65%	$1,122,920
12/12/2022	BEN	BEN 100 21 APR 23 25 PUT	$1.60	-0.34	$1.82	6,035	13.75%	$1,098,370
11/1/2022	EBAY	EBAY 100 21 APR 23 50 PUT	$11.25	-0.8	$9.50	1,077	15.56%	$1,023,150
10/24/2022	HST	HST 100 21 APR 23 15 PUT	$1	-0.24	$0.60	16,122	40%	$967,320
12/15/2022	HAL	HAL 100 21 APR 23 32 PUT	$2.26	-0.28	$2.16	4,261	4.42%	$920,376
12/1/2022	MNTV	MNTV 100 21 APR 23 6 PUT	$0.50	-0.19	$0.48	17,300	4%	$830,400
12/2/2022	XPEV	XPEV 100 21 APR 23 17.5 PUT	$6.65	-0.58	$7.85	1,049	18.05%	$823,465
11/4/2022	TWLO	TWLO 100 21 APR 23 45 PUT	$9.50	-0.44	$6.70	1,218	29.47%	$816,060
9/21/2022	ONON	ONON 100 21 APR 23 17.5 PUT	$2.80	-0.37	$2.75	2,604	1.79%	$716,100
11/7/2022	SJR	SJR 100 21 APR 23 25 PUT	$3.50	-0.36	$2.20	2,914	37.14%	$641,080
8/19/2022	RIO	RIO 100 21 APR 23 67.5 PUT	$12.21	-0.7	$5.37	1,152	56.02%	$618,624
10/3/2022	NKE	NKE 100 21 APR 23 90 PUT	$11.15	-0.51	$4.19	1,468	62.42%	$615,092
11/7/2022	TWLO	TWLO 100 21 APR 23 35 PUT	$4.20	-0.23	$2.24	2,658	46.67%	$595,392
10/14/2022	FSR	FSR 100 21 APR 23 5 PUT	$1.10	-1	$0.68	8,476	38.18%	$576,368
11/11/2022	YUMC	YUMC 100 21 APR 23 45 PUT	$2.25	-0.21	$1.30	4,337	42.22%	$563,810
10/24/2022	OKTA	OKTA 100 21 APR 23 55 PUT	$10.55	-0.41	$4.85	1,093	54.03%	$530,105
11/7/2022	RIO	RIO 100 21 APR 23 57.5 PUT	$6.20	-0.44	$2.05	2,580	66.94%	$528,900

May 2023

Bullish: The May expiration is a newer one that lacks a lot of open interest. **Antero (AR) is** a natural gas play has seen large ITM call buys as has **Conoco (COP). Steel Dynamics (STLD)** and **Teck (TECK)** are two favorite metals names with large bullish open interest and **Freeport (FCX)** also has some notable call OI.

Date	Ticke	Contract	Price	Delt	Last	Current OI	Price %	Current Valu
11/3/2022	FRPT	FRPT 100 19 MAY 23 70 CALL	$8.40	0.54	$7.90	15,204	5.95%	$12,011,160
10/25/2022	COP	COP 100 19 MAY 23 90 CALL	$37.80	0.86	$35.15	1,714	7.01%	$6,024,710
10/18/2022	CAT	CAT 100 19 MAY 23 220 CALL	$6.60	0.26	$29.10	1,924	340.91%	$5,598,840
11/4/2022	AAPL	AAPL 100 19 MAY 23 145 CALL	$12.30	0.5	$7.15	7,088	41.87%	$5,067,920
10/12/2022	TMUS	TMUS 100 19 MAY 23 125 CALL	$21.70	0.68	$22.45	1,718	3.46%	$3,856,910
10/5/2022	Z	Z 100 19 MAY 23 35 CALL	$4.48	0.49	$5.45	6,141	21.65%	$3,346,845
12/9/2022	AR	AR 100 19 MAY 23 25 CALL	$10	0.8	$11.80	2,620	18%	$3,091,600
12/9/2022	AR	AR 100 19 MAY 23 20 CALL	$13.80	0.9	$15.20	1,600	10.14%	$2,432,000
10/25/2022	STLD	STLD 100 19 MAY 23 105 CALL	$10.83	0.48	$11.20	2,074	3.42%	$2,322,880
11/2/2022	TECK	TECK 100 19 MAY 23 36 CALL	$3.15	0.44	$4.95	4,061	57.14%	$2,010,195
11/10/2022	ABT	ABT 100 19 MAY 23 105 CALL	$7.86	0.53	$9.95	1,917	26.59%	$1,907,415
9/20/2022	DHI	DHI 100 19 MAY 23 75 CALL	$8.79	0.53	$16.24	1,174	84.76%	$1,906,576
5/6/2022	UBER	UBER 100 19 MAY 23 32.5 CALL	$3.74	0.46	$1.37	13,900	63.37%	$1,904,300
10/21/2022	FCX	FCX 100 19 MAY 23 35 CALL	$3.80	0.48	$6.41	2,826	68.68%	$1,811,466
12/2/2022	DASH	DASH 100 19 MAY 23 60 CALL	$9.70	0.54	$8.85	1,821	8.76%	$1,611,585
11/11/2022	CAT	CAT 100 19 MAY 23 250 CALL	$18.25	0.47	$12.55	1,193	31.23%	$1,497,215
11/9/2022	CLMT	CLMT 100 19 MAY 23 12 CALL	$8	0.85	$3.50	4,158	56.25%	$1,455,300
12/2/2022	QFIN	QFIN 100 19 MAY 23 22.5 CALL	$1.75	0.36	$2	7,121	14.29%	$1,424,200
11/9/2022	DKNG	DKNG 100 19 MAY 23 15 CALL	$1.64	0.45	$1.24	10,744	24.39%	$1,332,256
10/24/2022	NIO	NIO 100 19 MAY 23 12.5 CALL	$1.63	0.47	$1.93	6,502	18.40%	$1,254,886
10/31/2022	COP	COP 100 19 MAY 23 140 CALL	$11.55	0.46	$2.83	3,558	75.50%	$1,006,914
12/16/2022	BAX	BAX 100 19 MAY 23 50 CALL	$4.60	0.54	$4.36	2,086	5.22%	$909,496
12/13/2022	IFF	IFF 100 19 MAY 23 120 CALL	$4.40	0.32	$3.80	2,108	13.64%	$801,040
10/27/2022	COP	COP 100 19 MAY 23 120 CALL	$20.55	0.64	$7.70	1,034	62.53%	$796,180
10/24/2022	SLB	SLB 100 19 MAY 23 60 CALL	$4.90	0.43	$2.30	3,212	53.06%	$738,760
10/20/2022	CVS	CVS 100 19 MAY 23 97.5 CALL	$5.75	0.42	$5.33	1,097	7.30%	$584,701
11/10/2022	OXY	OXY 100 19 MAY 23 90 CALL	$3.80	0.29	$0.98	5,879	74.21%	$576,142
11/16/2022	OXY	OXY 100 19 MAY 23 77.5 CALL	$8.50	0.51	$2.97	1,718	65.06%	$510,246
11/9/2022	OXY	OXY 100 19 MAY 23 72.5 CALL	$10.50	0.57	$3.78	1,053	64%	$398,034
10/26/2022	OXY	OXY 100 19 MAY 23 80 CALL	$8.60	0.49	$2.13	1,861	75.23%	$396,393
11/23/2022	PAGS	PAGS 100 19 MAY 23 12.5 CALL	$1.15	0.43	$0.35	10,881	69.57%	$380,835

Bearish: The May expiration lacks much open interest but **Apple (AAPL)** saw massive put buys through mid-November across multiple strikes. **Schlumberger (SLB)** another large cap with size puts bought along with **Caterpillar (CAT)**.

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
11/15/2022	AAPL	AAPL 100 19 MAY 23 130 PUT	$5.50	-0.21	$10.17	54,756	84.91%	$55,686,852
11/14/2022	AAPL	AAPL 100 19 MAY 23 130 PUT	$6.70	-0.25	$10.17	54,756	51.79%	$55,686,852
11/11/2022	AAPL	AAPL 100 19 MAY 23 135 PUT	$9.15	-0.32	$12.55	21,680	37.16%	$27,208,400
11/11/2022	AAPL	AAPL 100 19 MAY 23 145 PUT	$11.95	-0.4	$18.30	8,556	53.14%	$15,657,480
11/15/2022	AAPL	AAPL 100 19 MAY 23 150 PUT	$12.05	-0.41	$22.05	6,763	82.99%	$14,912,415
11/16/2022	SI	SI 100 19 MAY 23 35 PUT	$12.80	-0.42	$18.48	2,307	44.38%	$4,263,336
10/27/2022	CAT	CAT 100 19 MAY 23 210 PUT	$18.50	-0.42	$10.10	3,909	45.41%	$3,948,090
12/13/2022	SLB	SLB 100 19 MAY 23 47.5 PUT	$4	-0.34	$4.25	5,996	6.25%	$2,548,300
10/31/2022	SLB	SLB 100 19 MAY 23 47.5 PUT	$4.65	-0.32	$4.25	5,996	8.60%	$2,548,300
11/15/2022	ASTS	ASTS 100 19 MAY 23 7.5 PUT	$2.30	-0.34	$3.90	6,511	69.57%	$2,539,290
12/5/2022	CAT	CAT 100 19 MAY 23 200 PUT	$8.05	-0.22	$8.02	3,068	0.37%	$2,460,536
11/28/2022	CVS	CVS 100 19 MAY 23 100 PUT	$5.95	-0.44	$8.80	2,416	47.90%	$2,126,080
12/12/2022	ETN	ETN 100 19 MAY 23 150 PUT	$7.10	-0.32	$8.40	2,145	18.31%	$1,801,800
11/29/2022	HD	HD 100 19 MAY 23 305 PUT	$19.70	-0.37	$17.80	1,008	9.64%	$1,794,240
10/28/2022	COP	COP 100 19 MAY 23 115 PUT	$11.19	-0.33	$13.05	1,239	16.62%	$1,616,895
11/10/2022	CPNG	CPNG 100 19 MAY 23 22.5 PUT	$5	-0.49	$6.60	2,430	32%	$1,603,800
11/28/2022	ROST	ROST 100 19 MAY 23 105 PUT	$6.25	-0.28	$5.60	2,518	10.40%	$1,410,080
12/7/2022	STT	STT 100 19 MAY 23 77.5 PUT	$6.10	-0.36	$6	2,196	1.64%	$1,317,600
10/31/2022	PINS	PINS 100 19 MAY 23 22.5 PUT	$3.40	-0.32	$2.76	4,460	18.82%	$1,230,960
11/8/2022	FCX	FCX 100 19 MAY 23 32 PUT	$3.75	-0.32	$2.11	5,224	43.73%	$1,102,264
9/20/2022	CHRW	CHRW 100 19 MAY 23 85 PUT	$3.80	-0.2	$3.90	2,502	2.63%	$975,780
11/16/2022	LEN	LEN 100 19 MAY 23 85 PUT	$9.10	-0.41	$5.70	1,412	37.36%	$804,840
9/29/2022	PFSI	PFSI 100 19 MAY 23 30 PUT	$1.67	-0.13	$1.15	6,764	31.14%	$777,860
12/15/2022	TAL	TAL 100 19 MAY 23 7 PUT	$1.88	-0.42	$1.37	3,978	27.13%	$544,986
11/3/2022	PINS	PINS 100 19 MAY 23 20 PUT	$2.77	-0.28	$1.80	2,970	35.02%	$534,600

June 2023

Bullish: The June expiration contains a lot of open interest led by bullish call positions in large caps like **AAPL, TMUS, BA, KO, CVX, FSLR, GS, CAT, PG, MSFT** and **C. Pinduoduo (PDD)** has a massive buy position in June $75 calls and $90 calls. **Abbott (ABT), Stryker (SYK)** and **Medtronic (MDT)** a theme with large cap medical device call buys positioned for June. **Peloton (PTON)** has an interesting position of 49,000 June $15 calls as part of a takeover spread bet. **Datadog (DDOG)** a highflier in Software with over 12,000 June $110 calls bought. **MetLife (MET)** with over 11,000 June $75 calls stands out as it also has size in the $72.5 calls. **Raytheon (RTX)** a Defense name with a recent size June call buyer while **Valvoline (VVV)** shows up once again as an unusual large call buy name.

Date	Ticker	Contract	Price	Delt	Last	Current OI	Price %	Current Valu
6/9/2022	AAPL	AAPL 100 16 JUN 23 60 CALL	$85.20	0.92	$75.90	22,880	10.92%	$173,659,200
10/11/2022	PDD	PDD 100 16 JUN 23 75 CALL	$7.80	0.44	$23.30	23,476	198.72%	$54,699,080
2/8/2022	TMUS	TMUS 100 16 JUN 23 110 CALL	$26.80	0.7	$45.45	10,558	69.59%	$47,986,110
4/1/2022	AAPL	AAPL 100 16 JUN 23 65 CALL	$109.25	0.98	$78.10	3,268	28.51%	$25,523,080
6/15/2021	AAPL	AAPL 100 16 JUN 23 100 CALL	$37.65	0.77	$36.65	6,844	2.66%	$25,083,260
4/1/2022	AAPL	AAPL 100 16 JUN 23 70 CALL	$105.60	0.97	$64.97	3,489	38.48%	$22,668,033
10/17/2022	BA	BA 100 16 JUN 23 155 CALL	$14.72	0.46	$42.80	4,431	190.76%	$18,964,680
11/25/2022	EL	EL 100 16 JUN 23 230 CALL	$20.35	0.5	$32.10	5,804	57.74%	$18,630,840
6/22/2022	PDD	PDD 100 16 JUN 23 90 CALL	$9.35	0.43	$14.80	12,307	58.29%	$18,214,360
11/10/2022	MSFT	MSFT 100 16 JUN 23 250 CALL	$23.26	0.53	$18.90	7,646	18.74%	$14,450,940
5/10/2022	NFLX	NFLX 100 16 JUN 23 220 CALL	$27.50	0.47	$87	1,540	216.36%	$13,398,000
9/1/2022	KO	KO 100 16 JUN 23 60 CALL	$5.90	0.58	$6.05	21,223	2.54%	$12,839,915
12/14/2022	META	META 100 16 JUN 23 135 CALL	$14	0.49	$10.40	11,433	25.71%	$11,890,320
4/11/2022	AAPL	AAPL 100 16 JUN 23 90 CALL	$79.45	0.86	$46.07	2,554	42.01%	$11,766,278
10/5/2022	GS	GS 100 16 JUN 23 300 CALL	$40.95	0.59	$59.70	1,895	45.79%	$11,313,150
11/4/2022	PFE	PFE 100 16 JUN 23 47.5 CALL	$3.95	0.51	$6.40	15,431	62.03%	$9,875,840
9/13/2022	CVX	CVX 100 16 JUN 23 145 CALL	$27.70	0.66	$32.30	2,986	16.61%	$9,644,780
9/7/2022	FSLR	FSLR 100 16 JUN 23 150 CALL	$17.06	0.49	$26.38	3,650	54.63%	$9,628,700
11/10/2022	MSFT	MSFT 100 16 JUN 23 175 CALL	$73.15	0.88	$87.30	1,101	19.34%	$9,611,730
9/20/2022	CSCO	CSCO 100 16 JUN 23 40 CALL	$5.65	0.62	$8.65	10,711	53.10%	$9,265,015
10/24/2022	BABA	BABA 100 16 JUN 23 70 CALL	$8.85	0.49	$26.03	3,480	194.12%	$9,058,440
10/12/2022	JPM	JPM 100 16 JUN 23 110 CALL	$9.15	0.47	$23.93	3,752	161.53%	$8,978,536
1/27/2022	GS	GS 100 16 JUN 23 310 CALL	$59.78	0.64	$83.59	1,047	39.83%	$8,751,873
10/7/2022	PG	PG 100 16 JUN 23 125 CALL	$10.68	0.53	$29.80	2,902	179.03%	$8,647,960
9/15/2021	PFE	PFE 100 16 JUN 23 40 CALL	$7.25	0.66	$12.41	6,779	71.17%	$8,412,739
11/4/2022	CAT	CAT 100 16 JUN 23 230 CALL	$25.35	0.55	$24	3,273	5.33%	$7,855,200
10/31/2022	ATVI	ATVI 100 16 JUN 23 85 CALL	$4.20	0.35	$3.20	24,477	23.81%	$7,832,640
10/28/2022	META	META 100 16 JUN 23 115 CALL	$11.90	0.47	$18.30	4,029	53.78%	$7,373,070
4/19/2022	NEE	NEE 100 16 JUN 23 82.5 CALL	$8.60	0.52	$7.50	9,661	12.79%	$7,245,750
11/10/2022	BLMN	BLMN 100 16 JUN 23 15 CALL	$10	0.88	$6.90	10,004	31%	$6,902,760
10/17/2022	ABT	ABT 100 16 JUN 23 105 CALL	$9.85	0.53	$12.30	5,413	24.87%	$6,657,990
10/31/2022	META	META 100 16 JUN 23 120 CALL	$7.40	0.36	$16	4,136	116.22%	$6,617,600
9/14/2022	PTON	PTON 100 16 JUN 23 15 CALL	$2.26	0.5	$1.34	49,105	40.71%	$6,580,070
7/5/2022	C	C 100 16 JUN 23 45 CALL	$6	0.55	$3.45	18,328	42.50%	$6,323,160
9/26/2022	PG	PG 100 16 JUN 23 135 CALL	$12.15	0.55	$19.78	3,174	62.80%	$6,278,172
10/12/2022	WMT	WMT 100 16 JUN 23 125 CALL	$17.32	0.65	$23.03	2,706	32.97%	$6,231,918
10/24/2022	BIDU	BIDU 100 16 JUN 23 90 CALL	$10.45	0.46	$30.27	1,904	189.67%	$5,763,408
12/12/2022	DDOG	DDOG 100 16 JUN 23 110 CALL	$5.30	0.3	$4.42	12,869	16.60%	$5,688,098

Date	Ticker	Contract	Price	Delt	Last	Current OI	Price %	Current Valu
11/7/2022	MSFT	MSFT 100 16 JUN 23 260 CALL	$11.35	0.35	$14.44	3,799	27.22%	$5,485,756
11/8/2022	ADBE	ADBE 100 16 JUN 23 350 CALL	$25.10	0.42	$29.10	1,883	15.94%	$5,479,530
10/14/2022	ABBV	ABBV 100 16 JUN 23 145 CALL	$12.80	0.51	$22.06	2,449	72.34%	$5,402,494
8/12/2022	FSLR	FSLR 100 16 JUN 23 130 CALL	$15.90	0.51	$38.46	1,312	141.89%	$5,045,952
9/21/2022	PEP	PEP 100 16 JUN 23 165 CALL	$16.87	0.59	$23.35	2,137	38.41%	$4,989,895
12/14/2022	SYK	SYK 100 16 JUN 23 250 CALL	$28	0.61	$21.70	2,233	22.50%	$4,845,610
12/15/2022	CVX	CVX 100 16 JUN 23 170 CALL	$15.87	0.54	$15.20	3,150	4.22%	$4,788,000
8/31/2022	SQ	SQ 100 16 JUN 23 80 CALL	$14.10	0.54	$6.15	7,621	56.38%	$4,686,915
11/16/2022	MGM	MGM 100 16 JUN 23 38 CALL	$5.15	0.57	$3.57	12,708	30.68%	$4,536,756
9/19/2022	ABBV	ABBV 100 16 JUN 23 140 CALL	$13.90	0.55	$25.38	1,783	82.59%	$4,525,254
9/22/2022	MCD	MCD 100 16 JUN 23 250 CALL	$20	0.53	$31.60	1,420	58%	$4,487,200
5/11/2022	XOM	XOM 100 16 JUN 23 100 CALL	$6.60	0.38	$12.53	3,551	89.85%	$4,449,403
12/2/2022	SBUX	SBUX 100 16 JUN 23 105 CALL	$9.51	0.54	$6.15	7,112	35.33%	$4,373,880
6/7/2022	MET	MET 100 16 JUN 23 75 CALL	$5.31	0.41	$3.72	11,736	29.94%	$4,365,792
10/20/2022	BIDU	BIDU 100 16 JUN 23 100 CALL	$15.45	0.56	$25.15	1,709	62.78%	$4,298,135
10/25/2022	NKE	NKE 100 16 JUN 23 100 CALL	$7.75	0.44	$14.40	2,913	85.81%	$4,194,720
9/16/2022	FSLR	FSLR 100 16 JUN 23 160 CALL	$14.95	0.44	$21.75	1,912	45.48%	$4,158,600
8/16/2021	PFE	PFE 100 16 JUN 23 45 CALL	$7.10	0.59	$8.05	5,128	13.38%	$4,128,040
10/17/2022	KO	KO 100 16 JUN 23 55 CALL	$5.22	0.56	$9.70	4,088	85.82%	$3,965,360
6/8/2022	MET	MET 100 16 JUN 23 72.5 CALL	$5.80	0.44	$4.88	7,925	15.86%	$3,867,400
12/15/2022	RTX	RTX 100 16 JUN 23 95 CALL	$9.40	0.61	$9.12	4,188	2.98%	$3,819,456
10/19/2022	GILD	GILD 100 16 JUN 23 67.5 CALL	$5.38	0.49	$20.67	1,844	284.20%	$3,811,548
10/28/2022	LMT	LMT 100 16 JUN 23 500 CALL	$40	0.5	$27.10	1,397	32.25%	$3,785,870
11/9/2022	PG	PG 100 16 JUN 23 140 CALL	$9.10	0.49	$16.76	2,218	84.18%	$3,717,368
9/27/2022	INTC	INTC 100 16 JUN 23 30 CALL	$2.35	0.41	$1.47	24,503	37.45%	$3,601,941
10/5/2022	C	C 100 16 JUN 23 35 CALL	$10.70	0.77	$10.72	3,258	0.19%	$3,492,576
11/17/2022	VVV	VVV 100 16 JUN 23 35 CALL	$2.73	0.47	$1.70	20,118	37.73%	$3,420,060
6/1/2022	PG	PG 100 16 JUN 23 145 CALL	$14.15	0.53	$12.25	2,791	13.43%	$3,418,975
11/30/2022	MDT	MDT 100 16 JUN 23 70 CALL	$10.60	0.69	$9.76	3,296	7.92%	$3,216,896
9/20/2022	WMB	WMB 100 16 JUN 23 30 CALL	$4	0.6	$5.05	6,212	26.25%	$3,137,060
6/16/2022	PYPL	PYPL 100 16 JUN 23 72.5 CALL	$15.65	0.61	$8.50	3,673	45.69%	$3,122,050
6/1/2022	XOM	XOM 100 16 JUN 23 97.5 CALL	$12.40	0.54	$14.23	2,157	14.76%	$3,069,411
8/11/2022	AIG	AIG 100 16 JUN 23 55 CALL	$7.15	0.57	$11.80	2,489	65.03%	$2,937,020
6/13/2022	BAC	BAC 100 16 JUN 23 33 CALL	$4	0.52	$2.62	11,072	34.50%	$2,900,864
11/28/2022	AMC	AMC 100 16 JUN 23 11 CALL	$1.30	0.45	$0.39	73,882	70%	$2,881,398
3/29/2022	BMY	BMY 100 16 JUN 23 70 CALL	$8.06	0.57	$6.83	4,216	15.26%	$2,879,528
6/28/2022	ORCL	ORCL 100 16 JUN 23 70 CALL	$8.70	0.55	$14.01	1,993	61.03%	$2,792,193
6/13/2022	NEE	NEE 100 16 JUN 23 75 CALL	$7.90	0.5	$14.50	1,924	83.54%	$2,789,800

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
6/8/2022	TXN	TXN 100 16 JUN 23 170 CALL	$18.90	0.5	$15.10	1,842	20.11%	$2,781,420
9/27/2022	C	C 100 16 JUN 23 50 CALL	$2.40	0.32	$1.72	16,085	28.33%	$2,766,620
12/9/2022	ABBV	ABBV 100 16 JUN 23 165 CALL	$12.80	0.54	$8.95	3,012	30.08%	$2,695,740
11/3/2022	PINS	PINS 100 16 JUN 23 25 CALL	$4.11	0.55	$4.15	6,452	0.97%	$2,677,580
9/20/2022	CSCO	CSCO 100 16 JUN 23 37.5 CALL	$7.29	0.7	$11.50	2,322	57.75%	$2,670,300
12/6/2022	CRM	CRM 100 16 JUN 23 140 CALL	$14.60	0.51	$11.50	2,276	21.23%	$2,617,400
9/16/2022	TMUS	TMUS 100 16 JUN 23 145 CALL	$13.25	0.52	$11.70	2,188	11.70%	$2,559,960
11/17/2022	TTD	TTD 100 16 JUN 23 50 CALL	$11.40	0.63	$7.05	3,583	38.16%	$2,526,015
10/31/2022	CI	CI 100 16 JUN 23 350 CALL	$20.80	0.42	$18.30	1,357	12.02%	$2,483,310
11/29/2022	VALE	VALE 100 16 JUN 23 18 CALL	$1.32	0.4	$1.06	23,086	19.70%	$2,447,116
7/29/2022	XOM	XOM 100 16 JUN 23 120 CALL	$4.45	0.27	$4	6,001	10.11%	$2,400,400
9/19/2022	KMB	KMB 100 16 JUN 23 120 CALL	$11.40	0.55	$21.63	1,093	89.74%	$2,364,159
9/8/2022	BAC	BAC 100 16 JUN 23 38 CALL	$2.39	0.4	$0.85	27,715	64.44%	$2,355,775
9/1/2022	GM	GM 100 16 JUN 23 40 CALL	$5.10	0.53	$2.47	9,177	51.57%	$2,266,719
9/20/2022	YUM	YUM 100 16 JUN 23 115 CALL	$10.44	0.53	$20.90	1,052	100.19%	$2,198,680
9/21/2022	PM	PM 100 16 JUN 23 90 CALL	$11.72	0.64	$16.30	1,341	39.08%	$2,185,830
6/10/2022	OXY	OXY 100 16 JUN 23 60 CALL	$16.10	0.65	$9.35	2,214	41.93%	$2,070,090
12/6/2022	IQ	IQ 100 16 JUN 23 3.5 CALL	$0.92	0.63	$1.34	15,214	45.65%	$2,038,676
9/20/2022	KMI	KMI 100 16 JUN 23 17 CALL	$2.04	0.58	$1.56	13,012	23.53%	$2,029,872
12/8/2022	DOCU	DOCU 100 16 JUN 23 47.5 CALL	$9.10	0.57	$15.85	1,271	74.18%	$2,014,535
11/22/2022	NEM	NEM 100 16 JUN 23 47.5 CALL	$4.30	0.49	$3.90	5,164	9.30%	$2,013,960
6/16/2022	MU	MU 100 16 JUN 23 60 CALL	$9.05	0.53	$3.58	5,441	60.44%	$1,947,878
8/1/2022	CELH	CELH 100 16 JUN 23 130 CALL	$15.10	0.46	$14.52	1,341	3.84%	$1,947,132
6/28/2022	ORCL	ORCL 100 16 JUN 23 67.5 CALL	$9.75	0.58	$15.90	1,216	63.08%	$1,933,440
10/26/2022	GOOGL	GOOGL 100 16 JUN 23 110 CALL	$5.95	0.37	$2.50	7,633	57.98%	$1,908,250
11/22/2022	LVS	LVS 100 16 JUN 23 48 CALL	$4.45	0.46	$5.75	3,234	29.21%	$1,859,550
10/5/2022	MU	MU 100 16 JUN 23 70 CALL	$2.96	0.29	$1.35	13,293	54.39%	$1,794,555
7/8/2022	NKE	NKE 100 16 JUN 23 110 CALL	$14.15	0.55	$8.45	2,083	40.28%	$1,760,135
6/14/2022	OXY	OXY 100 16 JUN 23 70 CALL	$12.18	0.54	$5.05	3,471	58.54%	$1,752,855
12/16/2022	KO	KO 100 16 JUN 23 65 CALL	$2.80	0.44	$2.60	6,683	7.14%	$1,737,580
11/22/2022	WYNN	WYNN 100 16 JUN 23 90 CALL	$7.30	0.42	$8.90	1,935	21.92%	$1,722,150
12/12/2022	ABNB	ABNB 100 16 JUN 23 100 CALL	$14.15	0.55	$8.76	1,941	38.09%	$1,700,316
12/16/2022	UNP	UNP 100 16 JUN 23 210 CALL	$16.50	0.53	$15	1,114	9.09%	$1,671,000
11/14/2022	TMUS	TMUS 100 16 JUN 23 155 CALL	$9.55	0.46	$6.60	2,506	30.89%	$1,653,960
10/24/2022	MSFT	MSFT 100 16 JUN 23 285 CALL	$12.40	0.35	$6.70	2,413	45.97%	$1,616,710
10/6/2022	JNJ	JNJ 100 16 JUN 23 180 CALL	$4.75	0.3	$7.10	2,243	49.47%	$1,592,530
11/4/2022	NTES	NTES 100 16 JUN 23 75 CALL	$6	0.4	$8.60	1,805	43.33%	$1,552,300
11/29/2022	QCOM	QCOM 100 16 JUN 23 120 CALL	$14	0.55	$10.15	1,493	27.50%	$1,515,395

Bearish: The June expirations contains a lot of put open interest and mega-caps dominate the flows as usual but **Block (SQ), Charter (CHTR), Roblox (RBLX), Salesforce (CRM), Tyson (TSN), Airbnb (ABNB), Royal Caribbean (RCL), CrowdStrike (CRWD), FedEx (FDX), BJ's (BJ), Seagate (STX), Cloudflare (NET),** and **Tarde Desk (TTD)** a few interesting ones with notable put buys in open interest.

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
11/10/2022	AAPL	AAPL 100 16 JUN 23 130 PUT	$7.80	-0.26	$10.90	64,098	39.74%	$69,866,820
11/18/2022	AAPL	AAPL 100 16 JUN 23 135 PUT	$8	-0.27	$13.29	32,148	66.12%	$42,724,692
11/28/2022	AMC	AMC 100 16 JUN 23 6 PUT	$2.07	-0.23	$2.81	125,310	35.75%	$35,212,110
2/25/2022	SQ	SQ 100 16 JUN 23 80 PUT	$9.40	-0.17	$23.80	11,806	153.19%	$28,098,280
4/19/2022	AMD	AMD 100 16 JUN 23 85 PUT	$12.13	-0.31	$22.50	10,051	85.49%	$22,614,750
10/25/2022	TSLA	TSLA 100 16 JUN 23 230 PUT	$44.56	-0.44	$81.95	2,129	83.91%	$17,447,155
11/12/2021	MSFT	MSFT 100 16 JUN 23 270 PUT	$18.20	-0.22	$36	4,174	97.80%	$15,026,400
9/19/2022	CHTR	CHTR 100 16 JUN 23 270 PUT	$13.95	-0.15	$20.50	7,177	46.95%	$14,712,850
5/6/2022	INTC	INTC 100 16 JUN 23 42.5 PUT	$5.30	-0.41	$15.79	9,187	197.92%	$14,506,273
6/24/2022	CRM	CRM 100 16 JUN 23 175 PUT	$20.80	-0.35	$47.45	2,777	128.13%	$13,176,865
9/1/2021	MU	MU 100 16 JUN 23 55 PUT	$5.60	-0.21	$7.75	16,080	38.39%	$12,462,000
8/5/2022	INTC	INTC 100 16 JUN 23 32.5 PUT	$3.05	-0.33	$6.44	18,708	111.15%	$12,047,952
5/9/2022	INTC	INTC 100 16 JUN 23 37.5 PUT	$3.55	-0.3	$11	8,725	209.86%	$9,597,500
11/15/2022	RBLX	RBLX 100 16 JUN 23 45 PUT	$12.50	-0.49	$19.05	5,005	52.40%	$9,534,525
12/2/2022	QCOM	QCOM 100 16 JUN 23 120 PUT	$11.10	-0.38	$16.75	5,665	50.90%	$9,488,875
12/7/2021	UBER	UBER 100 16 JUN 23 35 PUT	$6.55	-0.32	$10.67	8,889	62.90%	$9,484,563
5/2/2022	SQ	SQ 100 16 JUN 23 100 PUT	$25.25	-0.36	$40.65	2,233	60.99%	$9,077,145
12/3/2021	SQ	SQ 100 16 JUN 23 115 PUT	$10.60	-0.15	$47.90	1,754	351.89%	$8,401,660
6/17/2022	C	C 100 16 JUN 23 42.5 PUT	$4.90	-0.36	$3.41	21,806	30.41%	$7,435,846
6/16/2022	COIN	COIN 100 16 JUN 23 55 PUT	$22.30	-0.31	$23.85	3,079	6.95%	$7,343,415
12/2/2022	META	META 100 16 JUN 23 115 PUT	$13.45	-0.35	$16.06	4,567	19.41%	$7,334,602
3/4/2022	SQ	SQ 100 16 JUN 23 65 PUT	$8.40	-0.15	$13.62	5,366	62.14%	$7,308,492
12/14/2021	SQ	SQ 100 16 JUN 23 105 PUT	$8.46	-0.13	$44.59	1,627	427.07%	$7,254,793
4/12/2022	INTC	INTC 100 16 JUN 23 45 PUT	$5.60	-0.42	$17.25	3,719	208.04%	$6,415,275
4/25/2022	F	F 100 16 JUN 23 12 PUT	$1.54	-0.26	$1.58	39,536	2.60%	$6,246,688
11/4/2022	AAL	AAL 100 16 JUN 23 12 PUT	$1.32	-0.26	$1.41	42,705	6.82%	$6,021,405
10/10/2022	CRM	CRM 100 16 JUN 23 140 PUT	$16.32	-0.36	$19.90	3,007	21.94%	$5,983,930
7/6/2022	DIS	DIS 100 16 JUN 23 90 PUT	$9.19	-0.34	$10.37	5,671	12.84%	$5,880,827
3/10/2022	SQ	SQ 100 16 JUN 23 75 PUT	$12.19	-0.19	$19.80	2,967	62.43%	$5,874,660
6/3/2022	TSN	TSN 100 16 JUN 23 77.5 PUT	$5.86	-0.3	$11.45	4,991	95.39%	$5,714,695
6/28/2022	CCL	CCL 100 16 JUN 23 7.5 PUT	$1.45	-0.2	$1.31	42,235	9.66%	$5,532,785
12/16/2022	GME	GME 100 16 JUN 23 45 PUT	$27	-0.56	$26.96	1,950	0.15%	$5,257,200
5/6/2022	TSM	TSM 100 16 JUN 23 85 PUT	$9.60	-0.36	$11.37	4,619	18.44%	$5,251,803
9/14/2022	ABNB	ABNB 100 16 JUN 23 105 PUT	$12	-0.26	$24.45	2,141	103.75%	$5,234,745
10/27/2022	SIMO	SIMO 100 16 JUN 23 50 PUT	$6.33	-0.34	$4.10	12,317	35.23%	$5,049,970
10/4/2022	JPM	JPM 100 16 JUN 23 110 PUT	$10.20	-0.41	$3.84	12,958	62.35%	$4,975,872
11/16/2022	PINS	PINS 100 16 JUN 23 24 PUT	$4.05	-0.36	$3.75	13,018	7.41%	$4,881,750
11/28/2022	RCL	RCL 100 16 JUN 23 60 PUT	$10.50	-0.42	$13.10	3,716	24.76%	$4,867,960
9/28/2021	MS	MS 100 16 JUN 23 80 PUT	$7.80	-0.24	$5.25	8,744	32.69%	$4,590,600
6/6/2022	TXN	TXN 100 16 JUN 23 170 PUT	$21.10	-0.46	$14.75	3,008	30.09%	$4,436,800
12/12/2022	TSLA	TSLA 100 16 JUN 23 125 PUT	$10.95	-0.19	$14.50	3,049	32.42%	$4,421,050
6/7/2022	IBM	IBM 100 16 JUN 23 150 PUT	$19.95	-0.59	$16.90	2,615	15.29%	$4,419,350

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
9/19/2022	CRWD	CRWD 100 16 JUN 23 150 PUT	$20.10	-0.29	$43.45	1,016	116.17%	$4,414,520
11/1/2022	MARA	MARA 100 16 JUN 23 17.5 PUT	$8.30	-0.41	$13.62	3,237	64.10%	$4,408,794
5/9/2022	CMCSA	CMCSA 100 16 JUN 23 40 PUT	$5.65	-0.45	$5.83	7,493	3.19%	$4,368,419
9/23/2022	MARA	MARA 100 16 JUN 23 10 PUT	$4.45	-0.27	$6.55	6,635	47.19%	$4,345,925
10/17/2022	AMC	AMC 100 16 JUN 23 3 PUT	$0.74	-0.11	$0.87	48,930	17.57%	$4,256,910
5/11/2022	SQ	SQ 100 16 JUN 23 60 PUT	$14.10	-0.26	$11	3,800	21.99%	$4,180,000
12/8/2022	FDX	FDX 100 16 JUN 23 170 PUT	$16.10	-0.41	$17	2,432	5.59%	$4,134,400
7/11/2022	AMZN	AMZN 100 16 JUN 23 75 PUT	$3.60	-0.12	$5.65	7,289	56.94%	$4,118,285
10/13/2022	MSFT	MSFT 100 16 JUN 23 215 PUT	$16.20	-0.31	$10.80	3,776	33.33%	$4,078,080
5/19/2022	XOM	XOM 100 16 JUN 23 100 PUT	$17.55	-0.57	$7.05	5,754	59.83%	$4,056,570
11/7/2022	CM	CM 100 16 JUN 23 45 PUT	$3.36	-0.41	$6.50	6,157	93.45%	$4,002,050
12/15/2022	NEE	NEE 100 16 JUN 23 97.5 PUT	$13.35	-0.74	$13.15	3,000	1.50%	$3,945,000
11/23/2021	BABA	BABA 100 16 JUN 23 70 PUT	$6.40	-0.1	$5.25	7,187	17.97%	$3,773,175
7/20/2022	CCL	CCL 100 16 JUN 23 10 PUT	$2.34	-0.31	$2.73	13,592	16.67%	$3,710,616
11/15/2022	SQ	SQ 100 16 JUN 23 70 PUT	$12.85	-0.35	$16.50	2,244	28.40%	$3,702,600
10/27/2022	BJ	BJ 100 16 JUN 23 75 PUT	$7.60	-0.41	$8.40	4,307	10.53%	$3,617,880
9/20/2022	CHTR	CHTR 100 16 JUN 23 260 PUT	$11.10	-0.13	$13.40	2,672	20.72%	$3,580,480
8/1/2022	GM	GM 100 16 JUN 23 35 PUT	$4.29	-0.36	$3.55	9,906	17.25%	$3,516,630
8/16/2022	C	C 100 16 JUN 23 60 PUT	$8.95	-0.62	$16.10	2,166	79.89%	$3,487,260
6/1/2022	UBER	UBER 100 16 JUN 23 22.5 PUT	$4.35	-0.36	$2.61	13,326	40%	$3,478,086
12/12/2022	CSCO	CSCO 100 16 JUN 23 50 PUT	$4.20	-0.51	$4.95	6,926	17.86%	$3,428,370
9/19/2022	UNH	UNH 100 16 JUN 23 500 PUT	$36.05	-0.38	$25	1,367	30.65%	$3,417,500
11/18/2022	TGT	TGT 100 16 JUN 23 145 PUT	$10.24	-0.29	$14.60	2,339	42.58%	$3,414,940
5/17/2022	CSCO	CSCO 100 16 JUN 23 45 PUT	$3.80	-0.31	$2.55	13,344	32.89%	$3,402,720
11/15/2022	SHOP	SHOP 100 16 JUN 23 45 PUT	$10.60	-0.46	$12.25	2,750	15.57%	$3,368,750
11/7/2022	FSLR	FSLR 100 16 JUN 23 170 PUT	$31.85	-0.54	$26.90	1,238	15.54%	$3,330,220
10/13/2022	ATVI	ATVI 100 16 JUN 23 70 PUT	$7.55	-0.37	$3.40	9,712	54.97%	$3,302,080
5/11/2022	SQ	SQ 100 16 JUN 23 50 PUT	$10.85	-0.2	$6.50	5,077	40.09%	$3,300,050
12/13/2022	ABT	ABT 100 16 JUN 23 110 PUT	$6	-0.4	$8.60	3,831	43.33%	$3,294,660
9/28/2022	STX	STX 100 16 JUN 23 55 PUT	$7.60	-0.39	$8.15	3,969	7.24%	$3,234,735
12/16/2022	FSLR	FSLR 100 16 JUN 23 160 PUT	$22.60	-0.45	$22.20	1,431	1.77%	$3,176,820
10/12/2022	PDD	PDD 100 16 JUN 23 45 PUT	$6.95	-0.24	$1.44	21,668	79.28%	$3,120,192
11/4/2022	FSLR	FSLR 100 16 JUN 23 135 PUT	$13.90	-0.3	$11.05	2,720	20.50%	$3,005,600
10/19/2022	EQT	EQT 100 16 JUN 23 30 PUT	$2.89	-0.18	$2.75	10,687	4.84%	$2,938,925
10/31/2022	FSLR	FSLR 100 16 JUN 23 140 PUT	$18.65	-0.38	$12.45	2,294	33.24%	$2,856,030
5/10/2022	CMCSA	CMCSA 100 16 JUN 23 37.5 PUT	$4.45	-0.36	$4.70	6,064	5.62%	$2,850,080
12/16/2022	ABNB	ABNB 100 16 JUN 23 85 PUT	$10.75	-0.36	$12.25	2,304	13.95%	$2,822,400
11/15/2022	OXY	OXY 100 16 JUN 23 70 PUT	$8.10	-0.35	$12.05	2,291	48.77%	$2,760,655
8/2/2022	DOW	DOW 100 16 JUN 23 47.5 PUT	$4.65	-0.34	$3.85	7,146	17.20%	$2,751,210
8/11/2022	SCHW	SCHW 100 16 JUN 23 70 PUT	$7.20	-0.4	$3.36	8,105	53.33%	$2,723,280
10/31/2022	CAT	CAT 100 16 JUN 23 210 PUT	$18.45	-0.39	$12.02	2,243	34.85%	$2,696,086
5/11/2022	MRVL	MRVL 100 16 JUN 23 55 PUT	$12.30	-0.4	$17.35	1,534	41.06%	$2,661,490

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
7/22/2021	MS	MS 100 16 JUN 23 85 PUT	$10.35	-0.34	$7.34	3,187	29.08%	$2,339,258
11/30/2022	XPEV	XPEV 100 16 JUN 23 12.5 PUT	$4.10	-0.44	$4.43	5,262	8.05%	$2,331,066
5/10/2022	TXN	TXN 100 16 JUN 23 150 PUT	$15.40	-0.33	$7.72	3,001	49.87%	$2,316,772
9/19/2022	BA	BA 100 16 JUN 23 145 PUT	$19.93	-0.41	$6.10	3,763	69.39%	$2,295,430
10/31/2022	META	META 100 16 JUN 23 75 PUT	$7.07	-0.23	$3.13	7,283	55.73%	$2,279,579
12/7/2022	HLF	HLF 100 16 JUN 23 10 PUT	$1.30	-0.23	$1.19	19,088	8.46%	$2,271,472
12/15/2022	TTD	TTD 100 16 JUN 23 50 PUT	$10	-0.43	$11.40	1,966	14%	$2,241,240
6/23/2022	CMCSA	CMCSA 100 16 JUN 23 35 PUT	$3.40	-0.33	$3.45	6,415	1.47%	$2,213,175
12/13/2022	ABT	ABT 100 16 JUN 23 105 PUT	$4.54	-0.32	$6.40	3,441	40.97%	$2,202,240
12/13/2022	AMAT	AMAT 100 16 JUN 23 110 PUT	$11.80	-0.4	$14.90	1,446	26.27%	$2,154,540
9/30/2022	MET	MET 100 16 JUN 23 60 PUT	$5.67	-0.42	$1.90	11,132	66.49%	$2,115,080
10/12/2022	RBLX	RBLX 100 16 JUN 23 30 PUT	$6.35	-0.26	$7.75	2,678	22.05%	$2,075,450
7/28/2022	CMCSA	CMCSA 100 16 JUN 23 45 PUT	$7.61	-0.65	$9.50	2,152	24.84%	$2,044,400
11/28/2022	BMY	BMY 100 16 JUN 23 80 PUT	$5.14	-0.48	$7	2,873	36.19%	$2,011,100
6/22/2022	CMCSA	CMCSA 100 16 JUN 23 32.5 PUT	$2.55	-0.25	$2.35	8,533	7.84%	$2,005,255
11/30/2022	PEP	PEP 100 16 JUN 23 185 PUT	$10	-0.46	$10.80	1,806	8%	$1,950,480
5/5/2022	MS	MS 100 16 JUN 23 75 PUT	$7.60	-0.32	$3.65	5,262	51.97%	$1,920,630
12/9/2022	NEM	NEM 100 16 JUN 23 52.5 PUT	$7.99	-0.6	$7.90	2,413	1.13%	$1,906,270
12/15/2022	AMZN	AMZN 100 16 JUN 23 74 PUT	$4.65	-0.23	$5.46	3,473	17.42%	$1,896,258
9/22/2022	BYND	BYND 100 16 JUN 23 15 PUT	$5.40	-0.3	$6.50	2,882	20.37%	$1,873,300
11/17/2022	NET	NET 100 16 JUN 23 40 PUT	$6.75	-0.25	$6.95	2,687	2.96%	$1,867,465
12/15/2022	FDX	FDX 100 16 JUN 23 150 PUT	$8.20	-0.25	$9.20	2,022	12.20%	$1,860,240
8/4/2022	UPS	UPS 100 16 JUN 23 180 PUT	$14.64	-0.34	$16	1,145	9.29%	$1,832,000
11/21/2022	LCID	LCID 100 16 JUN 23 12 PUT	$3.60	-0.45	$5.29	3,295	46.94%	$1,743,055
12/14/2022	AMZN	AMZN 100 16 JUN 23 82 PUT	$6.25	-0.28	$8.40	2,075	34.40%	$1,743,000
11/28/2022	NEE	NEE 100 16 JUN 23 95 PUT	$12.98	-0.73	$11.10	1,546	14.48%	$1,716,060
8/23/2022	ADI	ADI 100 16 JUN 23 150 PUT	$11.75	-0.32	$8.20	1,976	30.21%	$1,620,320
11/16/2022	BA	BA 100 16 JUN 23 165 PUT	$16.40	-0.36	$11.10	1,450	32.32%	$1,609,500
12/7/2022	ABNB	ABNB 100 16 JUN 23 70 PUT	$5.95	-0.21	$6.23	2,576	4.71%	$1,604,848
11/15/2022	COOP	COOP 100 16 JUN 23 35 PUT	$2.57	-0.21	$2.55	6,213	0.78%	$1,584,315
11/8/2022	ORCL	ORCL 100 16 JUN 23 72.5 PUT	$5.88	-0.37	$3.35	4,723	43.03%	$1,582,205
4/27/2022	SPOT	SPOT 100 16 JUN 23 75 PUT	$11	-0.22	$12	1,291	9.09%	$1,549,200
12/16/2022	CVX	CVX 100 16 JUN 23 145 PUT	$6.37	-0.22	$6.20	2,477	2.67%	$1,535,740
9/26/2022	SNOW	SNOW 100 16 JUN 23 105 PUT	$11.32	-0.15	$10.20	1,502	9.89%	$1,532,040
6/10/2022	NVDA	NVDA 100 16 JUN 23 117.5 PUT	$10.95	-0.17	$6.50	2,340	40.64%	$1,521,000
10/17/2022	BA	BA 100 16 JUN 23 135 PUT	$19.40	-0.4	$4.32	3,462	77.73%	$1,495,584
11/7/2022	CCL	CCL 100 16 JUN 23 5 PUT	$0.60	-0.13	$0.49	29,883	18.33%	$1,464,267
12/6/2022	WYNN	WYNN 100 16 JUN 23 82.5 PUT	$10.45	-0.38	$11.05	1,297	5.74%	$1,433,185
9/13/2022	FSLR	FSLR 100 16 JUN 23 130 PUT	$16.65	-0.34	$9.06	1,568	45.59%	$1,420,608
12/12/2022	FCX	FCX 100 16 JUN 23 30 PUT	$1.97	-0.19	$2.03	6,854	3.05%	$1,391,362
8/8/2022	CNC	CNC 100 16 JUN 23 85 PUT	$6.50	-0.3	$7.30	1,870	12.31%	$1,365,100
8/23/2022	AMAT	AMAT 100 16 JUN 23 92.5 PUT	$10.45	-0.32	$7.30	1,827	30.14%	$1,333,710

July 2023

Bullish: The July expiration has very little open interest but the unusual call buys in **Spectrum (SPB)** and **Tidewater (TDW)** notables while the **Airbnb (ABNB)** position one to keep an eye on for entry.

Date	Ticke	Contract	Price	Delt	Last	Current O	Price %	Current Valu
9/7/2022	BTU	BTU 100 21 JUL 23 27 CALL	$6.44	0.6	$7.30	10,023	13.35%	$7,316,790
9/6/2022	BTU	BTU 100 21 JUL 23 27 CALL	$7.18	0.62	$7.30	10,023	1.67%	$7,316,790
12/9/2022	SPB	SPB 100 21 JUL 23 70 CALL	$4.69	0.38	$4.10	11,000	12.58%	$4,510,000
8/11/2022	JPM	JPM 100 21 JUL 23 120 CALL	$12.85	0.54	$17.30	2,144	34.63%	$3,709,120
12/2/2022	ABNB	ABNB 100 21 JUL 23 95 CALL	$20.60	0.66	$11.85	2,592	42.48%	$3,071,520
12/5/2022	PDD	PDD 100 21 JUL 23 95 CALL	$15.30	0.55	$14.20	1,147	7.19%	$1,628,740
12/6/2022	TDW	TDW 100 21 JUL 23 25 CALL	$11.35	0.8	$9.56	1,101	15.77%	$1,052,556
11/28/2022	EBAY	EBAY 100 21 JUL 23 45 CALL	$5.20	0.55	$4.60	2,072	11.54%	$953,120
9/30/2022	AAPL	AAPL 100 21 JUL 23 175 CALL	$7.40	0.32	$2.53	3,672	65.81%	$929,016
12/15/2022	ZIM	ZIM 100 21 JUL 23 10 CALL	$8.23	0.83	$7.50	1,001	8.87%	$750,750

Bearish: **Biogen (BIIB)** and **Novavax (NVAX)** two Biotech stocks with notable July put buys and **eBay (EBAY)** an interesting one, otherwise a quiet expiration.

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
7/18/2022	AAPL	AAPL 100 21 JUL 23 170 PUT	$30.11	-0.63	$36.25	3,688	20.39%	$13,369,000
12/2/2022	BIIB	BIIB 100 21 JUL 23 300 PUT	$33.42	-0.43	$37.10	1,627	11.01%	$6,036,170
11/22/2022	AMZN	AMZN 100 21 JUL 23 90 PUT	$10.19	-0.38	$12.70	3,826	24.63%	$4,859,020
12/6/2022	NTNX	NTNX 100 21 JUL 23 37.5 PUT	$8	-0.74	$7.70	3,000	3.75%	$2,310,000
10/14/2022	JPM	JPM 100 21 JUL 23 110 PUT	$10.85	-0.42	$4.50	3,671	58.53%	$1,651,950
12/15/2022	NVAX	NVAX 100 21 JUL 23 17.5 PUT	$7.67	-0.43	$9.22	1,383	20.21%	$1,275,126
12/9/2022	XPEV	XPEV 100 21 JUL 23 12.5 PUT	$4.07	-0.4	$4.67	2,552	14.74%	$1,191,784
11/28/2022	EBAY	EBAY 100 21 JUL 23 45 PUT	$5.05	-0.44	$5.80	2,000	14.85%	$1,160,000
11/23/2022	PDD	PDD 100 21 JUL 23 60 PUT	$10.70	-0.31	$5.70	1,278	46.73%	$728,460

September 2023

Bullish: The September expiration features mostly large cap positioning with some call size in **Apple (AAPL), Microsoft (MSFT), Oracle (ORCL)** and **Tesla (TSLA).** We do notice large call buys in **JP Morgan (JPM), Moran Stanley (MS)** and **Bank America (BAC)** for the large banks.

Date	Ticke	Contract	Volum	Price	OI	Delt	IV	Premium	Last	Current O	Price %	OI %	Current Valu
4/1/2022	AAPL	AAPL 100 15 SEP 23 70 CALL	1,308	$105	87	0.97	49.93%	$13,734,000	$65	6,049	38.10%	333.62%	$39,318,500
10/27/2022	MSFT	MSFT 100 15 SEP 23 200 CALL	3,152	$47.15	167	0.71	37.75%	$15,019,280	$62.85	4,099	33.30%	23.50%	$25,762,215
11/23/2022	TSLA	TSLA 100 15 SEP 23 175 CALL	10,011	$45.50	406	0.65	63.80%	$45,650,160	$24	10,388	47.25%	0.28%	$24,931,200
11/2/2022	MSFT	MSFT 100 15 SEP 23 225 CALL	6,004	$31.05	196	0.59	35.43%	$19,783,180	$38.60	5,778	24.32%	6.81%	$22,303,080
10/27/2022	MSFT	MSFT 100 15 SEP 23 215 CALL	2,555	$37.65	136	0.63	37.97%	$9,747,325	$62.25	2,535	65.34%	5.80%	$15,780,375
9/20/2022	JPM	JPM 100 15 SEP 23 115 CALL	2,400	$14.51	1,518	0.55	32.21%	$3,468,000	$22.20	5,061	53%	29.17%	$11,235,420
9/14/2022	JPM	JPM 100 15 SEP 23 115 CALL	1,267	$14.06	93	0.54	32.49%	$1,792,805	$22.20	5,061	57.89%	272.13%	$11,235,420
9/19/2022	ORCL	ORCL 100 15 SEP 23 62.5 CALL	4,000	$12.65	4	0.67	35.04%	$5,160,000	$23.80	4,014	88.14%	0.25%	$9,553,320
9/15/2022	JPM	JPM 100 15 SEP 23 120 CALL	2,000	$12.97	885	0.52	31.45%	$2,640,000	$22.60	3,630	74.25%	25.82%	$8,203,800
11/30/2022	AAPL	AAPL 100 15 SEP 23 90 CALL	1,617	$57.20	1,912	0.9	49.25%	$9,241,155	$51.98	1,384	9.13%	60.78%	$7,194,032
11/3/2022	AAPL	AAPL 100 15 SEP 23 90 CALL	1,783	$56	503	0.89	48.10%	$9,966,970	$51.98	1,384	7.18%	39.46%	$7,194,032
10/31/2022	META	META 100 15 SEP 23 145 CALL	5,531	$5.25	631	0.25	49.88%	$2,959,085	$11.16	5,429	112.57%	11.90%	$6,058,764
12/5/2022	JPM	JPM 100 15 SEP 23 130 CALL	1,847	$15.10	2,532	0.57	30.60%	$2,807,440	$13.05	4,453	13.58%	1.69%	$5,811,165
9/21/2022	BAC	BAC 100 15 SEP 23 30 CALL	6,047	$6.50	4,347	0.66	38.32%	$3,930,550	$5.03	10,299	22.62%	0.91%	$5,180,397
8/8/2022	BAC	BAC 100 15 SEP 23 30 CALL	3,770	$6.50	598	0.67	36.10%	$2,469,350	$5.03	10,299	22.62%	135.78%	$5,180,397
12/13/2022	BABA	BABA 100 15 SEP 23 110 CALL	1,103	$11.95	815	0.46	53.68%	$1,301,540	$9.33	5,143	21.92%	168.14%	$4,798,419
12/5/2022	FSLR	FSLR 100 15 SEP 23 175 CALL	1,002	$27.11	0	0.57	48.44%	$2,716,422	$21.70	2,019	19.96%	101.50%	$4,381,230
10/21/2022	TSLA	TSLA 100 15 SEP 23 250 CALL	2,212	$37.60	1,037	0.53	60.55%	$8,604,680	$8.25	5,036	78.06%	55%	$4,154,700
8/30/2021	AAPL	AAPL 100 15 SEP 23 175 CALL	2,654	$17	696	0.45	29.75%	$4,644,500	$3.77	10,372	77.82%	209.61%	$3,910,244
10/17/2022	JPM	JPM 100 15 SEP 23 135 CALL	1,360	$7	311	0.35	30.60%	$938,400	$11.45	3,165	63.57%	89.41%	$3,623,925
11/21/2022	SHOP	SHOP 100 15 SEP 23 40 CALL	2,101	$7.40	1,152	0.56	70.05%	$1,554,740	$6.77	3,450	8.51%	6.06%	$2,335,650
10/17/2022	JPM	JPM 100 15 SEP 23 140 CALL	1,660	$5.24	892	0.29	29.86%	$879,800	$8.90	2,501	69.85%	2%	$2,225,890
10/27/2022	MS	MS 100 15 SEP 23 87.5 CALL	2,000	$7.40	490	0.45	33.63%	$1,500,000	$8.90	2,488	20.27%	0.08%	$2,214,320
10/6/2022	MSFT	MSFT 100 15 SEP 23 290 CALL	1,721	$16.90	868	0.38	31.41%	$2,908,490	$10	2,123	40.83%	18%	$2,123,000
10/28/2022	PINS	PINS 100 15 SEP 23 12.5 CALL	1,500	$12.60	3	0.9	77.88%	$1,927,500	$12.90	1,511	2.38%	0.53%	$1,949,190
11/30/2022	MS	MS 100 15 SEP 23 95 CALL	2,270	$8.63	1,068	0.5	31.58%	$2,031,650	$5.34	3,045	38.12%	8.78%	$1,626,030
11/29/2022	MS	MS 100 15 SEP 23 95 CALL	902	$8.52	256	0.49	31.83%	$780,230	$5.34	3,045	37.32%	162.95%	$1,626,030
10/19/2022	GOOG	GOOG 100 15 SEP 23 120 CALL	3,572	$8.30	2,510	0.4	35.99%	$3,000,480	$2.70	5,923	67.47%	2.61%	$1,599,210
11/15/2022	V	V 100 15 SEP 23 240 CALL	1,630	$13.50	0	0.39	28.53%	$2,200,500	$9.20	1,515	31.85%	7.06%	$1,393,800
12/9/2022	META	META 100 15 SEP 23 160 CALL	1,020	$8.30	643	0.32	48.25%	$851,700	$8.15	1,663	1.81%	0%	$1,355,345
11/29/2022	SHOP	SHOP 100 15 SEP 23 45 CALL	1,504	$7.20	1,505	0.53	68.38%	$1,097,920	$5.12	2,637	28.89%	12.36%	$1,350,144
6/21/2022	MSFT	MSFT 100 15 SEP 23 340 CALL	2,163	$8.89	1,383	0.21	28.46%	$2,108,925	$3.60	3,408	59.51%	3.89%	$1,226,880
10/24/2022	GOOG	GOOG 100 15 SEP 23 102.5 CALL	1,296	$15.40	519	0.59	39.78%	$2,086,560	$6.86	1,602	55.45%	11.74%	$1,098,972
12/16/2022	BABA	BABA 100 15 SEP 23 135 CALL	1,795	$4.95	822	0.25	52.67%	$897,500	$4.80	1,645	3.03%	37.14%	$789,600
9/19/2022	UAL	UAL 100 15 SEP 23 42 CALL	1,100	$7.10	10	0.56	52.57%	$786,500	$5.10	1,451	28.17%	30.72%	$740,010
9/22/2022	PYPL	PYPL 100 15 SEP 23 85 CALL	1,042	$19.80	146	0.64	51.82%	$2,068,370	$6.50	1,127	67.17%	5.13%	$732,550

Bearish: **Tesla (TSLA)** dominates the bear flow in September 2023 expiration while **Lilly (LLY), Blackstone (BX), Warner (WBD), Micron (MU), Wells Fargo (WFC),** and **JB Hunt (JBHT)** a few of the interesting large put positions.

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
9/21/2022	TSLA	TSLA 100 15 SEP 23 200 PUT	$20.88	-0.15	$61.48	16,817	194.44%	$103,390,916
6/13/2022	AMZN	AMZN 100 15 SEP 23 130 PUT	$31.85	-0.65	$45.23	10,406	42.01%	$47,066,338
6/29/2022	TSLA	TSLA 100 15 SEP 23 300 PUT	$30.70	-0.08	$148.90	2,186	385.02%	$32,549,540
10/14/2022	TSLA	TSLA 100 15 SEP 23 175 PUT	$29.75	-0.27	$43.80	7,095	47.23%	$31,076,100
10/7/2022	TSLA	TSLA 100 15 SEP 23 175 PUT	$25.75	-0.23	$43.80	7,095	70.10%	$31,076,100
5/20/2022	NVDA	NVDA 100 15 SEP 23 160 PUT	$36.50	-0.37	$24.90	4,413	31.78%	$10,988,370
12/6/2022	AMD	AMD 100 15 SEP 23 70 PUT	$11.15	-0.39	$13.25	5,385	18.83%	$7,135,125
10/7/2022	TSLA	TSLA 100 15 SEP 23 125 PUT	$11.01	-0.11	$19.05	3,072	73.02%	$5,852,160
9/30/2022	BAC	BAC 100 15 SEP 23 30 PUT	$3.80	-0.41	$2.35	24,643	38.16%	$5,791,105
8/11/2022	GOOGL	GOOGL 100 15 SEP 23 120 PUT	$13.60	-0.41	$31.50	1,640	131.62%	$5,166,000
7/19/2022	BAC	BAC 100 15 SEP 23 33 PUT	$4	-0.42	$3.65	13,284	8.75%	$4,848,660
11/22/2022	AMD	AMD 100 15 SEP 23 80 PUT	$15.05	-0.47	$18.85	2,366	25.25%	$4,459,910
9/30/2022	LLY	LLY 100 15 SEP 23 300 PUT	$27.37	-0.33	$14.60	2,926	46.66%	$4,271,960
7/18/2022	GOOG	GOOG 100 15 SEP 23 99 PUT	$9.10	-0.3	$11.15	3,258	22.53%	$3,632,670
11/21/2022	SQ	SQ 100 15 SEP 23 65 PUT	$16.15	-0.4	$13.75	2,111	14.86%	$2,902,625
10/24/2022	BX	BX 100 15 SEP 23 75 PUT	$9.65	-0.3	$12.90	2,182	33.68%	$2,814,780
2/10/2022	BAC	BAC 100 15 SEP 23 45 PUT	$5.10	-0.36	$13.37	2,070	162.16%	$2,767,590
11/16/2022	WBD	WBD 100 15 SEP 23 10 PUT	$1.70	-0.34	$2.15	12,427	26.47%	$2,671,805
11/16/2022	WFC	WFC 100 15 SEP 23 42.5 PUT	$3.40	-0.32	$4.73	5,579	39.12%	$2,638,867
7/15/2022	NVDA	NVDA 100 15 SEP 23 130 PUT	$18.55	-0.26	$13.10	1,955	29.38%	$2,561,050
11/14/2022	MSFT	MSFT 100 15 SEP 23 205 PUT	$11.73	-0.22	$11.15	2,160	4.94%	$2,408,400
12/8/2022	MU	MU 100 15 SEP 23 50 PUT	$5.49	-0.31	$6.49	3,266	18.21%	$2,119,634
11/30/2022	MU	MU 100 15 SEP 23 55 PUT	$8.20	-0.41	$9.15	2,219	11.59%	$2,030,385
6/27/2022	WFC	WFC 100 15 SEP 23 37.5 PUT	$4.30	-0.35	$2.71	7,437	36.98%	$2,015,427
12/7/2022	BX	BX 100 15 SEP 23 85 PUT	$16.40	-0.5	$18.44	1,075	12.44%	$1,982,300
12/7/2022	MRVL	MRVL 100 15 SEP 23 45 PUT	$9.65	-0.48	$7.85	2,195	18.65%	$1,723,075
10/19/2022	GOOG	GOOG 100 15 SEP 23 82 PUT	$5.40	-0.21	$6.35	2,645	17.59%	$1,679,575
11/16/2022	QCOM	QCOM 100 15 SEP 23 110 PUT	$11.50	-0.31	$13.30	1,172	15.65%	$1,558,760
7/29/2022	PYPL	PYPL 100 15 SEP 23 55 PUT	$4.80	-0.13	$4.95	2,704	3.13%	$1,338,480
10/21/2022	NVDA	NVDA 100 15 SEP 23 100 PUT	$13.20	-0.24	$5.60	2,311	57.58%	$1,294,160
9/30/2022	JBHT	JBHT 100 15 SEP 23 160 PUT	$18.36	-0.4	$10.70	1,064	41.72%	$1,138,480
10/31/2022	DAL	DAL 100 15 SEP 23 30 PUT	$3.15	-0.28	$2.91	3,829	7.62%	$1,114,239
11/2/2022	FSLR	FSLR 100 15 SEP 23 125 PUT	$12	-0.23	$10.65	1,026	11.25%	$1,092,690
7/11/2022	ORCL	ORCL 100 15 SEP 23 62.5 PUT	$5.05	-0.28	$2.09	3,415	58.61%	$713,735

December 2023

Bullish: These further out monthlies lack much open interest being newly created but some intriguing December call open interest names below.

Date	Ticke	Contract	Price	Delt	IV	Last	Current O	Price %	Current Valu
7/21/2022	PAR	PAR 100 15 DEC 23 22.5 CALL	$22.25	0.87	77.89%	$12.60	4,102	43.37%	$5,168,520
6/14/2022	PPG	PPG 100 15 DEC 23 135 CALL	$9.70	0.36	34.01%	$19	2,018	95.88%	$3,834,200
5/2/2022	MANU	MANU 100 15 DEC 23 12 CALL	$3.80	0.69	38.35%	$10.90	3,479	186.84%	$3,792,110
11/18/2022	NFE	NFE 100 15 DEC 23 60 CALL	$8.20	0.49	60.37%	$8.20	3,705	0%	$3,038,100
7/25/2022	Z	Z 100 15 DEC 23 40 CALL	$9	0.6	62.39%	$6.80	4,210	24.44%	$2,862,800
11/16/2022	FSLR	FSLR 100 15 DEC 23 210 CALL	$17.95	0.41	48%	$15	1,765	16.43%	$2,647,500
12/6/2022	KO	KO 100 15 DEC 23 60 CALL	$7.92	0.63	23.92%	$7.60	1,275	4.04%	$969,000

January 2024

Bullish: The January expirations always contain a ton of notable open interest, so I have excluded the overly active mega caps to look for more interesting names.

Date	Ticker	Contract	Price	Delta	IV	Last	Current O	Price %	Current Valu
9/14/2021	UAL	UAL 100 19 JAN 24 45 CALL	$11.31	0.62	45.02%	$5.65	58,450	50.04%	$33,024,250
10/19/2021	ON	ON 100 19 JAN 24 45 CALL	$10.55	0.62	40.63%	$26.40	7,674	150.24%	$20,259,360
3/4/2022	BA	BA 100 19 JAN 24 180 CALL	$42.79	0.62	43.40%	$39.78	4,869	7.03%	$19,368,882
10/19/2022	PG	PG 100 19 JAN 24 120 CALL	$21.95	0.65	29.45%	$35.90	5,305	63.55%	$19,044,950
6/17/2022	PCG	PCG 100 19 JAN 24 10 CALL	$2.35	0.62	49.31%	$6.83	27,061	190.64%	$18,482,663
5/24/2022	PINS	PINS 100 19 JAN 24 10 CALL	$9.50	0.85	80.04%	$15.20	11,541	60%	$17,542,320
9/23/2022	AEM	AEM 100 19 JAN 24 40 CALL	$7.20	0.55	47.35%	$14.46	12,115	100.83%	$17,518,290
9/8/2022	MET	MET 100 19 JAN 24 80 CALL	$3.90	0.32	27.80%	$5.80	29,292	48.72%	$16,989,360
9/30/2022	CELH	CELH 100 19 JAN 24 120 CALL	$23.40	0.56	74.76%	$29.15	5,582	24.57%	$16,271,530
8/30/2022	LLY	LLY 100 19 JAN 24 220 CALL	$105.40	0.82	41.91%	$151.98	1,003	44.19%	$15,243,594
8/29/2022	ETSY	ETSY 100 19 JAN 24 100 CALL	$34.40	0.69	64.48%	$46.77	3,234	35.96%	$15,125,418
4/4/2022	ZM	ZM 100 19 JAN 24 65 CALL	$71	0.88	68.03%	$20.03	6,540	71.79%	$13,099,620
8/24/2022	AMGN	AMGN 100 19 JAN 24 230 CALL	$36.85	0.61	27.93%	$62.80	1,767	70.42%	$11,096,760
6/22/2022	MO	MO 100 19 JAN 24 40 CALL	$5.30	0.53	31.50%	$7.06	14,968	33.21%	$10,567,408
10/4/2022	PAR	PAR 100 19 JAN 24 22.5 CALL	$12.95	0.81	55.65%	$12.95	8,000	0%	$10,360,000
5/24/2022	FGEN	FGEN 100 19 JAN 24 12.5 CALL	$3	0.6	89.75%	$5.90	15,959	96.67%	$9,415,810
11/3/2021	MO	MO 100 19 JAN 24 35 CALL	$10.50	0.72	38.59%	$11.30	8,239	7.62%	$9,310,070
12/10/2021	DE	DE 100 19 JAN 24 400 CALL	$48.90	0.47	32.32%	$89.47	1,028	82.97%	$9,197,516
8/5/2022	SCHW	SCHW 100 19 JAN 24 65 CALL	$14	0.64	35.55%	$22.72	4,027	62.29%	$9,149,344
9/23/2022	SM	SM 100 19 JAN 24 22.5 CALL	$17.45	0.83	76.06%	$25.50	3,578	46.13%	$9,123,900
9/12/2022	FSLR	FSLR 100 19 JAN 24 150 CALL	$25.70	0.56	48.24%	$37.39	2,154	45.49%	$8,053,806
12/17/2021	WFC	WFC 100 19 JAN 24 47.5 CALL	$8.66	0.57	33.35%	$3.70	21,581	57.27%	$7,984,970
9/1/2022	APO	APO 100 19 JAN 24 80 CALL	$3	0.25	38.88%	$4.90	16,202	63.33%	$7,938,980
8/25/2022	PEP	PEP 100 19 JAN 24 170 CALL	$22.69	0.6	23.36%	$24.29	3,187	7.05%	$7,741,223
9/14/2022	MCD	MCD 100 19 JAN 24 260 CALL	$27.40	0.52	24.85%	$35.60	2,070	29.93%	$7,369,200
1/6/2022	GOLD	GOLD 100 19 JAN 24 13 CALL	$6	0.78	39.15%	$5.48	12,545	8.67%	$6,874,660
10/13/2021	JNJ	JNJ 100 19 JAN 24 155 CALL	$18.75	0.54	21.34%	$33.17	2,064	76.91%	$6,846,288
9/21/2022	HD	HD 100 19 JAN 24 290 CALL	$32.11	0.5	32.32%	$58.79	1,103	83.09%	$6,484,537
8/3/2022	DIS	DIS 100 19 JAN 24 105 CALL	$20.95	0.63	35.67%	$7.57	8,558	63.87%	$6,478,406
10/10/2022	GD	GD 100 19 JAN 24 230 CALL	$28.15	0.54	29.85%	$37	1,673	31.44%	$6,190,100
9/23/2021	F	F 100 19 JAN 24 15 CALL	$3.10	0.57	42.67%	$0.88	70,329	71.61%	$6,188,952
11/11/2021	MDLZ	MDLZ 100 19 JAN 24 57.5 CALL	$9.30	0.62	24.03%	$13.50	4,518	45.16%	$6,099,300
11/9/2022	CSIQ	CSIQ 100 19 JAN 24 33 CALL	$11.70	0.7	65.56%	$9.40	6,265	19.66%	$5,889,100
6/21/2022	Z	Z 100 19 JAN 24 35 CALL	$8.25	0.6	64.48%	$9.37	5,750	13.58%	$5,387,750
12/12/2022	AXSM	AXSM 100 19 JAN 24 30 CALL	$51.90	0.94	85.40%	$49.46	1,089	4.70%	$5,386,194
8/24/2022	NKE	NKE 100 19 JAN 24 110 CALL	$21.13	0.61	37.89%	$16.27	3,287	23%	$5,347,949
12/5/2022	C	C 100 19 JAN 24 57.5 CALL	$2.24	0.28	31.47%	$1.65	32,123	26.34%	$5,300,295
2/15/2022	VALE	VALE 100 19 JAN 24 17 CALL	$2.80	0.58	29.98%	$2.14	24,624	23.57%	$5,269,536

Date	Ticker	Contract	Price	Delta	IV	Last	Current Q	Price %	Current Valu
6/22/2022	GILD	GILD 100 19 JAN 24 60 CALL	$8.32	0.55	29.30%	$29.20	1,749	250.96%	$5,107,080
12/15/2022	RTX	RTX 100 19 JAN 24 95 CALL	$13.60	0.61	28.89%	$14	3,562	2.94%	$4,986,800
10/13/2021	V	V 100 19 JAN 24 250 CALL	$24	0.45	26.84%	$10.82	4,594	54.92%	$4,970,708
9/21/2022	WMT	WMT 100 19 JAN 24 135 CALL	$18.54	0.58	28.10%	$21.15	2,238	14.08%	$4,733,370
10/28/2022	CMI	CMI 100 19 JAN 24 250 CALL	$31.10	0.53	31.81%	$26.65	1,775	14.31%	$4,730,375
12/14/2022	DLO	DLO 100 19 JAN 24 15 CALL	$4.08	0.63	78.51%	$4.50	10,032	10.29%	$4,514,400
5/5/2022	STNE	STNE 100 19 JAN 24 10 CALL	$3.53	0.67	85.96%	$2.82	15,361	20.11%	$4,331,802
10/21/2021	STLD	STLD 100 19 JAN 24 100 CALL	$5.30	0.28	39.89%	$19.70	2,117	271.70%	$4,170,490
10/19/2022	ABT	ABT 100 19 JAN 24 120 CALL	$5.75	0.32	29%	$9.60	4,317	66.96%	$4,144,320
7/27/2022	MRNA	MRNA 100 19 JAN 24 260 CALL	$18.25	0.36	56.75%	$33.42	1,210	83.12%	$4,043,820
12/12/2022	SPB	SPB 100 19 JAN 24 80 CALL	$3.80	0.33	44.25%	$4	10,000	5.26%	$4,000,000
11/18/2021	EMR	EMR 100 19 JAN 24 85 CALL	$18.30	0.64	28.02%	$19	2,068	3.83%	$3,929,200
11/4/2022	KHC	KHC 100 19 JAN 24 37.5 CALL	$4.74	0.55	29.76%	$5.60	6,864	18.14%	$3,843,840
9/13/2022	CVS	CVS 100 19 JAN 24 100 CALL	$14.85	0.58	29.95%	$9.85	3,878	33.67%	$3,819,830
8/23/2022	BSX	BSX 100 19 JAN 24 40 CALL	$6.90	0.63	31.26%	$8.50	4,471	23.19%	$3,800,350
6/17/2022	UBER	UBER 100 19 JAN 24 27.5 CALL	$4.64	0.52	60.66%	$5.05	7,081	8.84%	$3,575,905
10/6/2021	TEVA	TEVA 100 19 JAN 24 12 CALL	$2.30	0.52	45.57%	$0.64	55,091	72.17%	$3,525,824
9/15/2022	PNC	PNC 100 19 JAN 24 160 CALL	$25.10	0.57	32.04%	$16.30	2,100	35.06%	$3,423,000
1/7/2022	SRPT	SRPT 100 19 JAN 24 125 CALL	$21.50	0.5	61.59%	$31.50	1,066	46.51%	$3,357,900
11/3/2022	SRPT	SRPT 100 19 JAN 24 130 CALL	$24.50	0.55	65.09%	$31.42	1,068	28.24%	$3,355,656
12/3/2021	CPB	CPB 100 19 JAN 24 38 CALL	$7.50	0.6	29%	$19.80	1,694	164%	$3,354,120
5/11/2022	U	U 100 19 JAN 24 35 CALL	$13.90	0.7	87.78%	$6.75	4,856	51.44%	$3,277,800
8/19/2022	SE	SE 100 19 JAN 24 80 CALL	$17.15	0.58	64.91%	$7.65	4,277	55.39%	$3,271,905
3/10/2022	TCOM	TCOM 100 19 JAN 24 32 CALL	$3.50	0.39	49.67%	$9.79	3,266	179.71%	$3,197,414
12/6/2022	VFC	VFC 100 19 JAN 24 37.5 CALL	$2.30	0.33	42.70%	$1.25	23,623	45.65%	$2,952,875
12/15/2022	ADSK	ADSK 100 19 JAN 24 220 CALL	$27.75	0.52	42.23%	$26.10	1,119	5.95%	$2,920,590
5/17/2022	UNP	UNP 100 19 JAN 24 250 CALL	$27.80	0.47	31.21%	$10.80	2,704	61.15%	$2,920,320
11/22/2022	GE	GE 100 19 JAN 24 85 CALL	$15.70	0.63	36.40%	$9.85	2,960	37.26%	$2,915,600
7/12/2022	BBY	BBY 100 19 JAN 24 70 CALL	$13.80	0.56	44.98%	$20.30	1,427	47.10%	$2,896,810
3/10/2022	DAL	DAL 100 19 JAN 24 33 CALL	$8.30	0.62	49.08%	$6.85	4,122	17.47%	$2,823,570
5/26/2022	FYBR	FYBR 100 19 JAN 24 30 CALL	$5.10	0.54	51.84%	$3.50	8,006	31.37%	$2,802,100
10/20/2022	VST	VST 100 19 JAN 24 15 CALL	$8.10	0.81	48.61%	$9.49	2,952	17.16%	$2,801,448
8/18/2022	PRU	PRU 100 19 JAN 24 110 CALL	$10.49	0.46	28.20%	$6.79	3,942	35.27%	$2,676,618
1/13/2022	BKR	BKR 100 19 JAN 24 20 CALL	$8.80	0.75	41.44%	$9.90	2,691	12.50%	$2,664,090
10/31/2022	TFC	TFC 100 19 JAN 24 40 CALL	$8.70	0.66	34.99%	$5.58	4,759	35.86%	$2,655,522
10/12/2022	INTC	INTC 100 19 JAN 24 27.5 CALL	$3.70	0.49	44.05%	$3.90	6,775	5.41%	$2,642,250
2/7/2022	X	X 100 19 JAN 24 25 CALL	$5.49	0.57	55.54%	$6	4,371	9.29%	$2,622,600

Date	Ticker	Contract	Price	Delta	IV	Last	Current Q	Price %	Current Valu
1/6/2022	FROG	FROG 100 19 JAN 24 20 CALL	$14.40	0.81	71.67%	$7.20	3,536	50%	$2,545,920
7/18/2022	KMB	KMB 100 19 JAN 24 135 CALL	$13.40	0.5	25.30%	$14	1,817	4.48%	$2,543,800
6/30/2022	SLB	SLB 100 19 JAN 24 52.5 CALL	$3.80	0.35	47.44%	$8.95	2,818	135.53%	$2,522,110
8/24/2022	VET	VET 100 19 JAN 24 15 CALL	$15.90	0.87	76.71%	$5.40	4,636	66.04%	$2,503,440
7/8/2022	ANF	ANF 100 19 JAN 24 18 CALL	$5.20	0.64	60.59%	$9.60	2,556	84.62%	$2,453,760
9/19/2022	KDP	KDP 100 19 JAN 24 37 CALL	$4.70	0.58	25.20%	$3.40	6,091	27.66%	$2,070,940
5/23/2022	SHEL	SHEL 100 19 JAN 24 47.5 CALL	$16.50	0.73	39.07%	$12.20	1,672	26.06%	$2,039,840
3/18/2022	AIG	AIG 100 19 JAN 24 57.5 CALL	$12.30	0.61	35.39%	$11.20	1,802	8.94%	$2,018,240
6/9/2022	DAC	DAC 100 19 JAN 24 65 CALL	$22.15	0.69	51.84%	$7	2,870	68.40%	$2,009,000
9/28/2022	PANW	PANW 100 19 JAN 24 200 CALL	$19.64	0.46	38.63%	$10.80	1,846	45.01%	$1,993,680
10/26/2022	PACB	PACB 100 19 JAN 24 10 CALL	$3.55	0.69	107.63%	$3	6,474	15.49%	$1,942,200
5/16/2022	SU	SU 100 19 JAN 24 37 CALL	$7.35	0.57	43.94%	$2.45	7,922	66.67%	$1,940,890
7/1/2022	AEO	AEO 100 19 JAN 24 10 CALL	$3.25	0.71	44.83%	$5.90	3,197	81.54%	$1,886,230
9/28/2022	STLA	STLA 100 19 JAN 24 12.5 CALL	$2.15	0.54	46.46%	$2.80	6,734	30.23%	$1,885,520
9/8/2022	RIVN	RIVN 100 19 JAN 24 40 CALL	$10.35	0.63	74.09%	$2.78	6,415	73.14%	$1,783,370
12/13/2022	MGM	MGM 100 19 JAN 24 38 CALL	$7.35	0.61	44.39%	$5.40	3,237	26.53%	$1,747,980
11/25/2022	AFL	AFL 100 19 JAN 24 70 CALL	$9.93	0.61	26.92%	$7.40	2,305	25.48%	$1,705,700
11/15/2022	LOW	LOW 100 19 JAN 24 250 CALL	$17.20	0.39	33.73%	$13.50	1,225	21.51%	$1,653,750
3/18/2022	CHWY	CHWY 100 19 JAN 24 65 CALL	$8.70	0.47	59.44%	$5.50	2,996	36.78%	$1,647,800
6/17/2022	SNAP	SNAP 100 19 JAN 24 15 CALL	$4.10	0.62	79.61%	$1.02	15,540	75.12%	$1,585,080
11/23/2022	CNP	CNP 100 19 JAN 24 30 CALL	$4.15	0.6	27.59%	$3.40	4,243	18.07%	$1,442,620
4/21/2022	CMC	CMC 100 19 JAN 24 42 CALL	$12.50	0.65	47.97%	$11	1,299	12%	$1,428,900
9/29/2022	ALT	ALT 100 19 JAN 24 25 CALL	$4.40	0.58	119.48%	$2.86	4,536	35%	$1,297,296
5/31/2022	ABNB	ABNB 100 19 JAN 24 125 CALL	$32.35	0.63	57.17%	$8.55	1,514	73.57%	$1,294,470
8/3/2022	BCRX	BCRX 100 19 JAN 24 8 CALL	$5.60	0.81	76.06%	$4.60	2,483	17.86%	$1,142,180
9/2/2022	PSTG	PSTG 100 19 JAN 24 30 CALL	$7.30	0.62	49.07%	$4.58	2,281	37.26%	$1,044,698
5/26/2022	ENVX	ENVX 100 19 JAN 24 10 CALL	$5.20	0.74	87.97%	$4.30	2,338	17.31%	$1,005,340
9/27/2022	CRSP	CRSP 100 19 JAN 24 65 CALL	$20.50	0.66	64.85%	$6.70	1,434	67.32%	$960,780
9/14/2021	UAL	UAL 100 19 JAN 24 43 CALL	$11.85	0.65	46.74%	$6.27	1,305	47.09%	$818,235
7/11/2022	DDOG	DDOG 100 19 JAN 24 125 CALL	$27.50	0.58	66.54%	$6.85	1,191	75.09%	$815,835
5/23/2022	PYPL	PYPL 100 19 JAN 24 120 CALL	$10.20	0.39	48.44%	$2.47	3,265	75.78%	$806,455
7/28/2022	ALKS	ALKS 100 19 JAN 24 35 CALL	$4.60	0.49	54.78%	$2.05	3,905	55.43%	$800,525

Bearish:

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
12/2/2022	ABNB	ABNB 100 19 JAN 24 100 PUT	$19.30	-0.37	$25.45	12,125	31.87%	$30,858,125
4/18/2022	RH	RH 100 19 JAN 24 320 PUT	$76.59	-0.36	$95.36	2,967	24.51%	$28,293,312
9/29/2021	CHTR	CHTR 100 19 JAN 24 470 PUT	$22.97	-0.11	$114.60	2,024	398.91%	$23,195,040
5/17/2022	PYPL	PYPL 100 19 JAN 24 60 PUT	$10.20	-0.23	$8.20	26,729	19.61%	$21,917,780
10/26/2021	UBER	UBER 100 19 JAN 24 32.5 PUT	$4.35	-0.19	$9.67	20,386	122.30%	$19,713,262
3/7/2022	PYPL	PYPL 100 19 JAN 24 80 PUT	$15.10	-0.28	$18.45	8,690	22.19%	$16,033,050
1/13/2022	CRWD	CRWD 100 19 JAN 24 180 PUT	$41.70	-0.38	$74.20	2,005	77.94%	$14,877,100
10/4/2021	LRCX	LRCX 100 19 JAN 24 380 PUT	$48.40	-0.18	$44.55	2,993	7.95%	$13,333,815
5/9/2022	NKE	NKE 100 19 JAN 24 115 PUT	$20	-0.43	$18.85	6,264	5.75%	$11,807,640
5/26/2022	INTC	INTC 100 19 JAN 24 30 PUT	$2.20	-0.16	$5.70	20,606	159.09%	$11,745,420
8/15/2022	NVAX	NVAX 100 19 JAN 24 40 PUT	$16.55	-0.25	$30.35	3,630	83.38%	$11,017,050
12/1/2022	SNOW	SNOW 100 19 JAN 24 120 PUT	$21.80	-0.23	$23.80	3,821	9.17%	$9,093,980
3/31/2022	AXP	AXP 100 19 JAN 24 150 PUT	$13.60	-0.23	$20.30	4,477	49.26%	$9,088,310
2/18/2022	SQ	SQ 100 19 JAN 24 65 PUT	$11.80	-0.18	$17.16	5,159	45.42%	$8,852,844
2/2/2022	PLTR	PLTR 100 19 JAN 24 13 PUT	$4	-0.32	$6.60	13,393	65%	$8,839,380
8/4/2022	BAX	BAX 100 19 JAN 24 70 PUT	$14	-0.74	$16.50	4,570	17.86%	$7,540,500
11/18/2022	SI	SI 100 19 JAN 24 15 PUT	$5.03	-0.14	$6.19	11,988	23.06%	$7,420,572
11/8/2022	U	U 100 19 JAN 24 30 PUT	$11.55	-0.43	$9.68	7,540	16.19%	$7,298,720
5/16/2022	COIN	COIN 100 19 JAN 24 22.5 PUT	$6.20	-0.07	$6.35	11,211	2.42%	$7,118,985
10/20/2022	MAR	MAR 100 19 JAN 24 150 PUT	$20.70	-0.38	$18	3,932	13.04%	$7,077,600
6/16/2022	RCL	RCL 100 19 JAN 24 25 PUT	$5.20	-0.19	$1.75	39,030	66.35%	$6,830,250
5/17/2022	GE	GE 100 19 JAN 24 75 PUT	$11.82	-0.39	$8.40	8,044	28.93%	$6,756,960
10/11/2021	SRPT	SRPT 100 19 JAN 24 100 PUT	$37.70	-0.35	$23.40	2,832	37.93%	$6,626,880
1/5/2022	TRIP	TRIP 100 19 JAN 24 20 PUT	$3.30	-0.19	$4.50	12,178	36.36%	$5,480,100
11/22/2022	MCD	MCD 100 19 JAN 24 270 PUT	$19.63	-0.39	$21.70	2,476	10.55%	$5,372,920
6/10/2022	BX	BX 100 19 JAN 24 90 PUT	$12.55	-0.29	$23.20	2,313	84.86%	$5,366,160
4/26/2022	SPOT	SPOT 100 19 JAN 24 100 PUT	$23.80	-0.33	$31	1,701	30.25%	$5,273,100
4/7/2022	FDX	FDX 100 19 JAN 24 180 PUT	$21.70	-0.32	$29.85	1,662	37.56%	$4,961,070
6/10/2022	ROKU	ROKU 100 19 JAN 24 60 PUT	$13.25	-0.21	$21.80	2,187	64.53%	$4,767,660
12/8/2022	AVGO	AVGO 100 19 JAN 24 470 PUT	$45.60	-0.29	$38.60	1,217	15.35%	$4,697,620
8/15/2022	PARA	PARA 100 19 JAN 24 22.5 PUT	$3.60	-0.29	$7.09	6,156	96.94%	$4,364,604
9/7/2022	FISV	FISV 100 19 JAN 24 95 PUT	$8	-0.29	$8.95	4,700	11.87%	$4,206,500
2/1/2022	RDFN	RDFN 100 19 JAN 24 15 PUT	$2.50	-0.11	$9.90	4,219	296%	$4,176,810
9/14/2022	TTWO	TTWO 100 19 JAN 24 130 PUT	$20.15	-0.41	$34.10	1,200	69.23%	$4,092,000
3/31/2022	NET	NET 100 19 JAN 24 70 PUT	$11.75	-0.14	$30.30	1,320	157.87%	$3,999,600
5/10/2022	DISH	DISH 100 19 JAN 24 12.5 PUT	$1.85	-0.14	$2.65	14,731	43.24%	$3,903,715
10/3/2022	MOS	MOS 100 19 JAN 24 50 PUT	$10.86	-0.39	$11.15	2,977	2.67%	$3,319,355
7/21/2022	WSM	WSM 100 19 JAN 24 130 PUT	$26.20	-0.34	$30.28	1,075	15.57%	$3,255,100
10/17/2022	CVS	CVS 100 19 JAN 24 90 PUT	$10.85	-0.41	$7.50	4,084	30.88%	$3,063,000
12/12/2022	PINS	PINS 100 19 JAN 24 22.5 PUT	$4.55	-0.33	$4.08	7,488	10.33%	$3,055,104
11/4/2022	KHC	KHC 100 19 JAN 24 37.5 PUT	$4.34	-0.41	$2.95	10,334	32.03%	$3,048,530
12/8/2021	MQ	MQ 100 19 JAN 24 12.5 PUT	$5.40	-1	$6.40	4,669	18.52%	$2,988,160

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
8/31/2022	UAL	UAL 100 19 JAN 24 33 PUT	$6.46	-0.32	$4.25	7,009	34.21%	$2,978,825
7/5/2022	UAL	UAL 100 19 JAN 24 33 PUT	$7.60	-0.32	$4.25	7,009	44.08%	$2,978,825
12/12/2022	DD	DD 100 19 JAN 24 60 PUT	$4.40	-0.25	$4.80	6,085	9.09%	$2,920,800
2/15/2022	Z	Z 100 19 JAN 24 60 PUT	$15.20	-0.32	$22.90	1,272	50.66%	$2,912,880
9/21/2022	COP	COP 100 19 JAN 24 125 PUT	$28.40	-0.47	$26.40	1,097	7.04%	$2,896,080
5/19/2022	OKTA	OKTA 100 19 JAN 24 65 PUT	$14.10	-0.23	$14.55	1,972	3.19%	$2,869,260
12/14/2022	CSCO	CSCO 100 19 JAN 24 47.5 PUT	$3.95	-0.39	$5	5,684	26.58%	$2,842,000
3/25/2022	BA	BA 100 19 JAN 24 120 PUT	$7.95	-0.13	$6.20	4,565	22.01%	$2,830,300
8/30/2022	CME	CME 100 19 JAN 24 190 PUT	$22.80	-0.39	$26.90	1,051	17.98%	$2,827,190
11/17/2022	ADI	ADI 100 19 JAN 24 140 PUT	$13.10	-0.28	$10.10	2,796	22.90%	$2,823,960
11/21/2022	OXY	OXY 100 19 JAN 24 52.5 PUT	$5.55	-0.21	$6.25	4,467	12.61%	$2,791,875
12/15/2022	NVAX	NVAX 100 19 JAN 24 22.5 PUT	$12.45	-0.4	$14.35	1,944	15.26%	$2,789,640
12/5/2022	GOOG	GOOG 100 19 JAN 24 102.5 PUT	$12.55	-0.42	$18.15	1,530	44.62%	$2,776,950
8/4/2022	FISV	FISV 100 19 JAN 24 90 PUT	$6.48	-0.23	$6.65	4,174	2.62%	$2,775,710
6/30/2022	SPCE	SPCE 100 19 JAN 24 8 PUT	$4.05	-0.31	$4.48	6,156	10.62%	$2,757,888
2/3/2022	SPCE	SPCE 100 19 JAN 24 8 PUT	$3.47	-0.23	$4.48	6,156	29.11%	$2,757,888
12/9/2022	MMM	MMM 100 19 JAN 24 100 PUT	$5.25	-0.19	$6.15	4,425	17.14%	$2,721,375
12/10/2021	JWN	JWN 100 19 JAN 24 17.5 PUT	$4	-0.27	$4.55	5,790	13.75%	$2,634,450
6/8/2022	GPN	GPN 100 19 JAN 24 105 PUT	$9.37	-0.24	$16.80	1,546	79.30%	$2,597,280
11/14/2022	BTU	BTU 100 19 JAN 24 30 PUT	$8.80	-0.35	$8.59	2,991	2.39%	$2,569,269
11/2/2022	XOM	XOM 100 19 JAN 24 100 PUT	$10.80	-0.31	$10.70	2,398	0.93%	$2,565,860
6/28/2022	ALB	ALB 100 19 JAN 24 180 PUT	$25.65	-0.25	$18.50	1,377	27.88%	$2,547,450
8/2/2022	GOOGL	GOOGL 100 19 JAN 24 88 PUT	$5.80	-0.18	$10.70	2,362	84.48%	$2,527,340
11/2/2022	MET	MET 100 19 JAN 24 60 PUT	$3.95	-0.21	$3.60	6,950	8.86%	$2,502,000
11/4/2022	WBD	WBD 100 19 JAN 24 10 PUT	$2.09	-0.34	$2.45	10,040	17.22%	$2,459,800
6/29/2022	RCL	RCL 100 19 JAN 24 20 PUT	$3.95	-0.13	$1.17	20,993	70.38%	$2,456,181
3/1/2022	MS	MS 100 19 JAN 24 87.5 PUT	$16.10	-0.46	$10.85	2,256	32.61%	$2,447,760
12/1/2022	ABT	ABT 100 19 JAN 24 105 PUT	$8.60	-0.38	$8	3,032	6.98%	$2,425,600
10/7/2022	SBUX	SBUX 100 19 JAN 24 105 PUT	$21.39	-0.65	$14.55	1,644	31.98%	$2,392,020
11/16/2022	HD	HD 100 19 JAN 24 260 PUT	$16.77	-0.22	$15.80	1,488	5.78%	$2,351,040
11/10/2022	MCHP	MCHP 100 19 JAN 24 65 PUT	$8.05	-0.3	$6.60	3,533	18.01%	$2,331,780
10/4/2022	OSTK	OSTK 100 19 JAN 24 30 PUT	$10.10	-0.38	$9.03	2,565	10.59%	$2,316,195
8/19/2022	MMM	MMM 100 19 JAN 24 140 PUT	$14.80	-0.41	$20.60	1,124	39.19%	$2,315,440
6/28/2022	BMY	BMY 100 19 JAN 24 77.5 PUT	$7.80	-0.43	$8.70	2,575	11.54%	$2,240,250
11/7/2022	BAC	BAC 100 19 JAN 24 20 PUT	$0.53	-0.06	$0.63	35,456	18.87%	$2,233,728
1/12/2022	DAL	DAL 100 19 JAN 24 40 PUT	$7.60	-0.38	$8.95	2,483	17.76%	$2,222,285
9/27/2022	W	W 100 19 JAN 24 20 PUT	$4.60	-0.13	$4.30	5,107	6.52%	$2,196,010
11/15/2022	TSN	TSN 100 19 JAN 24 60 PUT	$5.60	-0.34	$6	3,588	7.14%	$2,152,800
12/9/2022	MET	MET 100 19 JAN 24 70 PUT	$6.79	-0.37	$7	3,047	3.09%	$2,132,900
10/13/2022	DUK	DUK 100 19 JAN 24 110 PUT	$25.95	-0.79	$16.20	1,314	37.57%	$2,128,680
7/22/2022	AMGN	AMGN 100 19 JAN 24 255 PUT	$31.55	-0.52	$19.90	1,069	36.93%	$2,127,310
8/2/2022	DISH	DISH 100 19 JAN 24 15 PUT	$3.70	-0.27	$3.83	5,553	3.51%	$2,126,799

Notable Short Puts

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
9/23/2021	AAL	AAL 100 19 JAN 24 10 PUT	$1.20	-0.1	$1.39	126,574	15.83%	$17,593,786
9/28/2021	F	F 100 19 JAN 24 12 PUT	$2.13	-0.27	$2.20	92,923	3.29%	$20,443,060
10/18/2022	SCPL	SCPL 100 19 JAN 24 12.5 PUT	$1.98	-0.35	$0.80	47,614	59.60%	$3,809,120
9/23/2022	X	X 100 17 JAN 25 10 PUT	$1.75	-0.12	$1.07	47,510	38.86%	$5,083,570
9/22/2021	BAC	BAC 100 19 JAN 24 28 PUT	$2.63	-0.19	$2.27	44,569	13.69%	$10,117,163
11/21/2022	RCL	RCL 100 19 JAN 24 25 PUT	$2.03	-0.07	$1.75	39,030	13.79%	$6,830,250
2/3/2022	X	X 100 19 JAN 24 10 PUT	$1	-0.08	$0.57	36,032	43%	$2,053,824
11/4/2022	MPW	MPW 100 21 APR 23 8 PUT	$0.60	-0.17	$0.80	35,302	33.33%	$2,824,160
9/9/2022	ATVI	ATVI 100 19 JAN 24 55 PUT	$1.99	-0.12	$1.62	31,819	18.59%	$5,154,678
10/13/2021	WFC	WFC 100 19 JAN 24 40 PUT	$5.59	-0.31	$4.35	31,543	22.18%	$13,721,205
10/25/2022	USFD	USFD 100 16 JUN 23 22.5 PUT	$1.25	-0.19	$0.45	31,030	64%	$1,396,350
10/14/2022	RCL	RCL 100 19 JAN 24 22.5 PUT	$3.25	-0.11	$1.38	30,908	57.54%	$4,265,304
10/13/2022	RCL	RCL 100 19 JAN 24 22.5 PUT	$3.45	-0.11	$1.38	30,908	60%	$4,265,304
10/31/2022	ATVI	ATVI 100 16 JUN 23 60 PUT	$3.60	-0.22	$1.30	30,395	63.89%	$3,951,350
10/7/2022	AAPL	AAPL 100 17 FEB 23 130 PUT	$7.26	-0.31	$6.50	29,840	10.47%	$19,396,000
11/14/2022	AMD	AMD 100 16 JUN 23 60 PUT	$5.15	-0.23	$6.75	29,833	31.07%	$20,137,275
10/19/2021	AAL	AAL 100 19 JAN 24 17 PUT	$3.14	-0.29	$5.21	29,691	65.92%	$15,469,011
12/6/2022	AYX	AYX 100 17 FEB 23 40 PUT	$4	-0.41	$1.58	28,571	60.50%	$4,514,218
10/3/2022	C	C 100 17 JAN 25 45 PUT	$9.35	-0.45	$8	28,563	14.44%	$22,850,400
4/14/2022	BYND	BYND 100 19 JAN 24 10 PUT	$1.80	-0.04	$4.40	27,525	144.44%	$12,111,000
9/20/2022	MU	MU 100 17 MAR 23 50 PUT	$6	-0.41	$3.75	27,199	37.50%	$10,199,625
9/21/2022	BAC	BAC 100 17 JAN 25 35 PUT	$6.16	-0.44	$6.40	27,052	3.90%	$17,313,280
5/13/2022	BAC	BAC 100 19 JAN 24 25 PUT	$2.14	-0.18	$1.47	24,678	31.31%	$3,627,666
8/11/2022	BAC	BAC 100 21 JUN 24 35 PUT	$4.94	-0.39	$5.85	23,765	18.42%	$13,902,525
6/21/2022	UAL	UAL 100 21 JUN 24 20 PUT	$2.83	-0.13	$1.25	23,602	55.83%	$2,950,250
10/19/2022	XP	XP 100 17 FEB 23 14 PUT	$1.05	-0.23	$1.20	23,137	14.29%	$2,776,440
10/24/2022	SBLK	SBLK 100 19 MAY 23 10 PUT	$0.65	-0.1	$0.25	22,354	61.54%	$558,850
10/11/2022	PDD	PDD 100 16 JUN 23 45 PUT	$6.65	-0.24	$1.44	21,668	78.35%	$3,120,192
7/14/2022	C	C 100 16 JUN 23 35 PUT	$2.68	-0.22	$1.25	21,364	53.36%	$2,670,500
11/10/2022	ACI	ACI 100 19 JAN 24 20 PUT	$2.55	-0.36	$2.50	21,053	1.96%	$5,263,250
5/24/2022	AAL	AAL 100 21 JUN 24 10 PUT	$2	-0.17	$1.71	20,691	14.50%	$3,538,161
9/15/2022	AMZN	AMZN 100 19 JAN 24 80 PUT	$4.21	-0.11	$10.40	20,199	147.03%	$21,006,960
2/25/2022	SQ	SQ 100 19 JAN 24 110 PUT	$25.65	-0.32	$43.80	19,944	70.76%	$87,354,720
2/14/2022	SQ	SQ 100 19 JAN 24 110 PUT	$28.50	-0.35	$43.80	19,944	53.68%	$87,354,720
5/12/2022	WFC	WFC 100 19 JAN 24 30 PUT	$2.67	-0.18	$1.52	19,717	43.07%	$2,996,984
9/20/2022	F	F 100 17 JAN 25 8 PUT	$1.13	-0.15	$1.06	19,491	6.19%	$2,066,046
9/19/2022	INTC	INTC 100 19 JAN 24 22.5 PUT	$2.18	-0.22	$2.22	19,461	1.83%	$4,320,342
5/24/2022	INTC	INTC 100 19 JAN 24 22.5 PUT	$1.09	-0.08	$2.22	19,461	103.67%	$4,320,342
5/6/2022	INTC	INTC 100 19 JAN 24 22.5 PUT	$0.87	-0.07	$2.22	19,461	155.17%	$4,320,342
2/3/2022	ATVI	ATVI 100 19 JAN 24 45 PUT	$2	-0.08	$0.80	19,152	60%	$1,532,160
9/16/2022	AAL	AAL 100 17 FEB 23 13 PUT	$1.60	-0.37	$1.27	18,955	20.63%	$2,407,285
11/10/2022	ATVI	ATVI 100 17 FEB 23 70 PUT	$4.59	-0.37	$1.20	18,761	73.86%	$2,251,320

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
9/27/2022	BAC	BAC 100 17 JAN 25 32 PUT	$5.75	-0.42	$4.90	18,481	14.78%	$9,055,690
11/10/2022	DLTR	DLTR 100 17 FEB 23 140 PUT	$4.50	-0.2	$6.80	18,214	51.11%	$12,385,520
9/8/2022	INTC	INTC 100 16 JUN 23 27.5 PUT	$2.60	-0.32	$3.22	18,211	23.85%	$5,863,942
11/23/2022	UBER	UBER 100 19 MAY 23 17.5 PUT	$0.66	-0.09	$0.91	18,171	37.88%	$1,653,561
9/30/2022	NCLH	NCLH 100 17 MAY 24 5 PUT	$0.90	-0.09	$0.41	17,496	54.44%	$717,336
5/2/2022	T	T 100 19 JAN 24 17 PUT	$1.91	-0.38	$1.59	17,203	16.75%	$2,735,277
11/15/2022	BX	BX 100 17 FEB 23 75 PUT	$1.83	-0.12	$7.08	17,173	286.89%	$12,158,484
6/29/2022	AAL	AAL 100 21 JUN 24 13 PUT	$4	-0.33	$3.05	16,858	23.75%	$5,141,690
9/26/2022	WFC	WFC 100 16 JUN 23 35 PUT	$2.82	-0.28	$1.46	16,724	48.23%	$2,441,704
9/30/2022	UAL	UAL 100 17 JAN 25 20 PUT	$3.10	-0.14	$1.89	16,492	39.03%	$3,116,988
11/29/2022	TSLA	TSLA 100 17 MAR 23 160 PUT	$14.65	-0.29	$24.10	16,204	64.51%	$39,051,640
10/31/2022	NCLH	NCLH 100 17 MAY 24 7.5 PUT	$1.17	-0.09	$0.92	16,130	21.37%	$1,483,960
10/11/2022	NCLH	NCLH 100 17 MAY 24 7.5 PUT	$1.85	-0.16	$0.92	16,130	50.27%	$1,483,960
11/9/2022	VSTO	VSTO 100 16 JUN 23 30 PUT	$7.50	-0.68	$4.50	15,543	40%	$6,994,350
9/14/2021	UAL	UAL 100 19 JAN 24 25 PUT	$2.52	-0.12	$1.98	15,479	21.43%	$3,064,842
7/6/2022	CMCSA	CMCSA 100 16 JUN 23 42.5 PUT	$5.95	-0.55	$7.82	15,371	31.43%	$12,020,122
9/13/2022	RVNC	RVNC 100 21 APR 23 22.5 PUT	$2.89	-0.25	$4.20	15,042	45.33%	$6,317,640
12/15/2022	HD	HD 100 17 FEB 23 290 PUT	$4.40	-0.17	$5.34	14,366	21.36%	$7,671,444
10/29/2021	UBER	UBER 100 19 JAN 24 40 PUT	$8	-0.33	$14.80	14,272	85%	$21,122,560
10/18/2022	ENB	ENB 100 19 JAN 24 30 PUT	$2.15	-0.25	$1.20	13,312	44.19%	$1,597,440
1/28/2022	BYND	BYND 100 19 JAN 24 35 PUT	$8.80	-0.16	$25.66	12,777	191.59%	$32,785,782
12/16/2022	UBER	UBER 100 21 JUN 24 25 PUT	$5.40	-0.33	$5.70	12,638	5.56%	$7,203,660
12/8/2022	NVDA	NVDA 100 17 MAR 23 125 PUT	$4.10	-0.13	$4.40	12,534	7.32%	$5,514,960
9/20/2022	MPW	MPW 100 21 APR 23 9 PUT	$0.50	-0.15	$1.10	12,411	120%	$1,365,210
9/9/2022	AMD	AMD 100 17 MAR 23 75 PUT	$6.70	-0.29	$13	12,378	94.03%	$16,091,400
9/30/2022	BAC	BAC 100 15 SEP 23 23 PUT	$1.45	-0.18	$0.72	12,265	50.34%	$883,080
6/10/2022	PLUG	PLUG 100 19 JAN 24 17.5 PUT	$6.50	-0.35	$6.58	11,894	1.23%	$7,826,252
12/1/2022	PDD	PDD 100 16 JUN 23 55 PUT	$4.20	-0.14	$3.05	11,759	27.38%	$3,586,495
9/23/2022	BP	BP 100 16 JUN 23 32 PUT	$6	-0.61	$2.06	11,712	65.67%	$2,412,672
12/14/2022	TSLA	TSLA 100 21 JUL 23 185 PUT	$42.85	-0.53	$50.25	11,596	17.27%	$58,269,900
12/15/2022	PINS	PINS 100 19 JAN 24 25 PUT	$5.15	-0.36	$5.40	11,412	4.85%	$6,162,480
8/24/2022	FSLR	FSLR 100 16 JUN 23 100 PUT	$9.20	-0.26	$2.90	11,348	68.48%	$3,290,920
12/15/2022	ABBV	ABBV 100 17 FEB 23 145 PUT	$1.68	-0.15	$1.81	11,157	7.74%	$2,019,417
12/16/2022	TGT	TGT 100 17 FEB 23 130 PUT	$2.84	-0.2	$2.80	11,058	1.41%	$3,096,240
9/14/2022	GOOG	GOOG 100 21 APR 23 95 PUT	$6.10	-0.28	$9.63	10,745	57.87%	$10,347,435
10/4/2022	CSX	CSX 100 17 FEB 23 32.5 PUT	$4.80	-0.78	$2.15	10,726	55.21%	$2,306,090
8/17/2022	C	C 100 17 MAR 23 55 PUT	$5.30	-0.5	$10.73	10,680	102.45%	$11,459,640
12/9/2022	CRM	CRM 100 17 FEB 23 115 PUT	$3.15	-0.2	$3.10	10,652	1.59%	$3,302,120
5/25/2022	PTON	PTON 100 19 JAN 24 5 PUT	$1.22	-0.08	$0.89	10,615	27.05%	$944,735
11/2/2022	CLF	CLF 100 16 JUN 23 10 PUT	$1.13	-0.23	$0.69	10,466	38.94%	$722,154
12/15/2022	CAT	CAT 100 17 MAR 23 200 PUT	$4.75	-0.19	$4.59	10,394	3.37%	$4,770,846
11/29/2022	SHEL	SHEL 100 21 APR 23 50 PUT	$1.55	-0.21	$1.80	10,370	16.13%	$1,866,600

Date	Ticker	Contract	Price	Delta	Last	Current OI	Price %	Current Value
10/7/2022	C	C 100 21 JUN 24 42.5 PUT	$7.40	-0.42	$5.05	10,333	31.76%	$5,218,165
12/15/2022	PM	PM 100 17 MAR 23 90 PUT	$1.50	-0.19	$1.30	10,326	13.33%	$1,342,380
10/12/2022	AMZN	AMZN 100 16 JUN 23 56 PUT	$1.28	-0.04	$1.17	10,171	8.59%	$1,190,007
12/2/2021	GOLD	GOLD 100 19 JAN 24 10 PUT	$1.65	-0.1	$0.36	10,149	78.18%	$365,364
12/1/2022	HAS	HAS 100 21 APR 23 45 PUT	$0.84	-0.09	$1.30	10,060	54.76%	$1,307,800
12/15/2022	HON	HON 100 17 FEB 23 195 PUT	$3.70	-0.25	$3.36	10,008	9.19%	$3,362,688
12/2/2022	SGFY	SGFY 100 17 FEB 23 28 PUT	$0.55	-0.4	$0.55	10,007	0%	$550,385
11/28/2022	ATVI	ATVI 100 16 JUN 23 70 PUT	$5.19	-0.33	$3.40	9,712	34.49%	$3,302,080
11/3/2022	AAL	AAL 100 19 MAY 23 13 PUT	$1.68	-0.35	$1.77	9,366	5.36%	$1,657,782
12/2/2022	PSTG	PSTG 100 16 JUN 23 20 PUT	$0.80	-0.12	$0.90	9,276	12.50%	$834,840
12/19/2022	AAL	AAL 100 15 SEP 23 10 PUT	$1.04	-0.23	$1.06	9,131	1.92%	$967,886
9/20/2022	MS	MS 100 17 JAN 25 80 PUT	$11.96	-0.33	$10.80	8,780	9.70%	$9,482,400
11/9/2022	VSTO	VSTO 100 19 MAY 23 30 PUT	$7.07	-0.7	$7.07	8,558	0%	$6,050,506
12/15/2022	ROKU	ROKU 100 17 MAR 23 30 PUT	$1.29	-0.11	$1.62	8,543	25.58%	$1,383,966
8/29/2022	RCL	RCL 100 19 JAN 24 45 PUT	$12.90	-0.39	$7.90	8,451	38.76%	$6,676,290
12/5/2022	BBY	BBY 100 17 MAR 23 60 PUT	$1.11	-0.09	$1.04	8,426	6.31%	$876,304
2/24/2022	CHTR	CHTR 100 19 JAN 24 450 PUT	$32.99	-0.19	$97.90	8,352	196.76%	$81,766,080
12/6/2022	NRG	NRG 100 16 JUN 23 28 PUT	$1.40	-0.21	$1.85	8,323	32.14%	$1,539,755
5/6/2022	UBER	UBER 100 19 MAY 23 20 PUT	$2.68	-0.22	$1.54	8,279	42.54%	$1,274,966
8/8/2022	TSN	TSN 100 16 JUN 23 80 PUT	$6.60	-0.42	$15.28	8,121	131.52%	$12,408,888
7/1/2022	VZ	VZ 100 16 JUN 23 45 PUT	$1.97	-0.26	$9.15	8,092	364.47%	$7,404,180
10/18/2022	ENB	ENB 100 19 JAN 24 32.5 PUT	$3.01	-0.31	$1.65	8,055	45.18%	$1,329,075
11/8/2022	PBR	PBR 100 21 APR 23 12 PUT	$2.35	-0.57	$3.17	8,023	34.89%	$2,543,291
10/13/2021	UBER	UBER 100 19 JAN 24 42.5 PUT	$8.85	-0.32	$16.96	8,020	91.64%	$13,601,920
11/10/2022	OXY	OXY 100 17 FEB 23 65 PUT	$4.55	-0.34	$5.77	7,956	26.81%	$4,590,612
8/25/2022	T	T 100 21 APR 23 18 PUT	$1.54	-0.5	$1.22	7,905	20.78%	$964,410
9/14/2022	CMCSA	CMCSA 100 19 JAN 24 35 PUT	$5.46	-0.45	$4.60	7,876	15.75%	$3,622,960
9/21/2022	GOLD	GOLD 100 17 JAN 25 15 PUT	$3.31	-0.4	$2.45	7,869	25.98%	$1,927,905
11/10/2022	ZI	ZI 100 21 APR 23 20 PUT	$1	-0.12	$1.05	7,850	5%	$824,250
11/11/2021	VALE	VALE 100 19 JAN 24 10 PUT	$2.65	-0.35	$0.60	7,689	77.36%	$461,340
7/1/2022	TSM	TSM 100 16 JUN 23 70 PUT	$7.10	-0.33	$4.30	7,451	39.44%	$3,203,930
7/22/2022	MS	MS 100 21 JUN 24 80 PUT	$12.60	-0.4	$9.26	7,056	26.51%	$6,533,856
11/9/2022	LYFT	LYFT 100 17 FEB 23 10 PUT	$1.35	-0.33	$1.15	6,971	14.81%	$801,665
10/21/2022	FCX	FCX 100 16 JUN 23 30 PUT	$4.22	-0.35	$2.03	6,854	51.90%	$1,391,362
10/24/2022	NEM	NEM 100 17 MAR 23 40 PUT	$3.40	-0.38	$1.22	6,843	64.12%	$834,846
12/13/2022	XP	XP 100 17 FEB 23 15 PUT	$1.05	-0.35	$1.75	6,808	66.67%	$1,191,400
9/20/2022	BYD	BYD 100 17 JAN 25 30 PUT	$3.06	-0.11	$2.95	6,750	3.59%	$1,991,250
8/2/2022	F	F 100 15 SEP 23 15 PUT	$2.66	-0.37	$3.90	6,503	46.62%	$2,536,170
12/16/2022	PCG	PCG 100 21 JUL 23 15 PUT	$1.15	-0.33	$1.15	6,500	0%	$747,500
12/5/2022	SHEL	SHEL 100 21 APR 23 52.5 PUT	$1.90	-0.26	$2.76	6,424	45.26%	$1,773,024
9/1/2022	PARA	PARA 100 16 JUN 23 25 PUT	$4.96	-0.49	$8.45	6,390	70.36%	$5,399,550
12/14/2022	EQT	EQT 100 17 MAR 23 30 PUT	$1.30	-0.18	$1.55	6,222	19.23%	$964,410
11/4/2022	GOOG	GOOG 100 21 APR 23 80 PUT	$5.12	-0.32	$3.45	6,213	32.62%	$2,143,485
12/7/2022	XP	XP 100 19 MAY 23 13 PUT	$0.97	-0.2	$1.50	6,066	54.64%	$909,900
11/8/2022	FSLY	FSLY 100 17 JAN 25 7.5 PUT	$2.70	-0.23	$2.44	6,018	9.63%	$1,468,392
2/11/2022	JPM	JPM 100 19 JAN 24 75 PUT	$3	-0.06	$1.94	5,909	35.33%	$1,146,346
10/5/2022	WELL	WELL 100 17 MAR 23 47.5 PUT	$1.25	-0.13	$0.52	5,623	58.40%	$292,396
9/28/2022	KO	KO 100 17 JAN 25 32.5 PUT	$1.05	-0.08	$0.58	5,563	44.76%	$322,654
4/22/2022	UBER	UBER 100 19 MAY 23 32.5 PUT	$6.90	-0.44	$8.10	5,553	17.39%	$4,497,930
11/7/2022	INVH	INVH 100 21 APR 23 25 PUT	$1	-0.18	$0.78	5,542	22%	$432,276
12/12/2022	NEE	NEE 100 17 NOV 23 85 PUT	$7.50	-0.41	$8.50	5,501	13.33%	$4,675,850
10/4/2022	JPM	JPM 100 16 JUN 23 90 PUT	$4.02	-0.18	$1.34	5,393	66.67%	$722,662
10/3/2022	MET	MET 100 16 JUN 23 62.5 PUT	$6.22	-0.44	$2.18	5,347	64.95%	$1,165,646
11/29/2022	BAC	BAC 100 21 JUN 24 40 PUT	$6.30	-0.5	$8.39	5,306	33.17%	$4,451,734
11/28/2022	FSLR	FSLR 100 15 SEP 23 150 PUT	$16.83	-0.29	$19.91	5,106	18.30%	$10,166,046
12/16/2022	UNP	UNP 100 17 FEB 23 190 PUT	$3.12	-0.19	$3.50	5,087	12.18%	$1,780,450
12/15/2022	UPS	UPS 100 17 FEB 23 160 PUT	$2.90	-0.19	$3.60	5,042	24.14%	$1,815,120
10/27/2022	XRX	XRX 100 17 JAN 25 8 PUT	$1.15	-0.13	$1.25	5,003	8.70%	$625,375

Sector & Industry Breakdowns

***I am slimming down this section for 2023 as past years reports have all the background on the individual industries and will be launching a research-centric website designed for industry analysis. This year will take a greater focus on looking at each industry in the current environment and outlook for the next few years while, most importantly, identifying the best investments per industry.*

My goal here is to provide a clear and concise view of key valuation metrics, management efficiency ratios, and backdrop for each industry. I then briefly touch on some of the top stocks in each group. This is a brief analysis that can serve as a guide throughout the year as we see sector trends develop by closely monitoring earnings reports. It is important to remember that these are current snapshots and projections, and one must due his/her due diligence throughout the year follow the earnings reports and management commentary, as the trends in these metrics are more important than the metrics themselves. I strongly encourage you to read the most recent earnings transcript and transcripts from investment conferences to better understand these companies.

*Active sector rotation has become more vital than ever in managing portfolios throughout the year, so this section can serve as a guide as to the best of breed type names to target. The section also features key recent management commentary from leaders across industries as these executives have the most knowledge on their respective industries and can give us great insight into market trends. My agenda here is to make you an informed investor across every sector and industry maximizing investment opportunities while highlighting the top 10-20% of strong businesses. I have attempted to break down each section further to allow it to flow better and make it an easier read. It is important to note that market research and sell-side firms release 100+ page reports on each of these industry groups but we really just want to focus important metrics, the trends and overall what we need to know to find the quality investment opportunities, so I try to keep it as concise as possible. ***

	Valuation Measure	Momentum Measure	Growth Measure	Quality Measure
Communication Services				
Media & Entertainment	Price to Sales, EV/EBITDA	12-Mth Return and 1-Mth Reversal, Trading Volume	PEG Ratio	ROE (1-Yr)
Telecommunication Services	Dividend Yield	12-Mth Return and 1-Mth Reversal	Dividend Growth	ROC
Consumer Discretionary				
Retailing	P/E (Trailing), EV/EBITDA	Relative Strength - 10W/40W	Estimate Revision	ROC
Other Discretionary (Autos, Durables, Services)	Price to Book	12-Mth Return and 1-Mth Reversal, 11-Mth Return	Estimate Revision	ROC, ROA
Consumer Staples	EV/EBITDA, Fwd P/E	Trading Volume, 12-Mth Return and 1-Mth Reversal	PEG Ratio	ROC
Energy	Price to Book, Fwd P/E	Trading Volume	Estimate Revision, Earnings Torpedo	ROC
Financials				
Banks	Historical Relative P/E, Fwd P/E, Trailing P/E	12-Mth Return and 1-Mth Reversal	EPS Momentum, PEG Ratio	ROC
Insurance	Historical Relative P/E	Trading Volume,12-Mth Return and 1-Mth Reversal	PEG Ratio	ROC
Diversified Financials	Historical Relative P/E, Fwd P/E, Trailing P/E	Relative Strength - 30W/75W, 12-Mth Return and 1-Mth Reversal	EPS Momentum, PEG Ratio	ROE (1-Yr), ROC
Health Care				
Health Care Equipment & Services	FCF/EV, Price to Free Cash Flow	12-Mth Return and 1-Mth Reversal	PEG Ratio, Estimate Revision	ROC
Pharmaceuticals, Biotech & Life Sciences	Price to Sales	Trading Volume	Estimate Revision	ROE (5-Yr, Debt Adj)
Industrials				
Capital Goods	EV/EBITDA, FCF/EV	12-Mth Return and 1-Mth Reversal	Earnings Torpedo, Estimate Revision	ROE (5-Yr), ROE (5-Yr, Debt Adj)
Other Industrials (Services, Transports)	EV/EBITDA, Trailing P/E	12-Mth Return and 1-Mth Reversal, Trading Volume	PEG Ratio	ROC, ROE (1-Yr, Debt Adj)
Information Technology	EV/EBITDA, FCF/EV	Trading Volume	Estimate Revision	ROA, ROE (1-Yr)
Materials	EV/EBITDA, Price to Cash Flow	12-Mth Return and 1-Mth Reversal	PEG Ratio	ROE (1-Yr, Debt Adj), ROE (5-Yr, Debt Adj)
Real Estate	Price to Cash Flow, EV/EBITDA	12-Mth Return and 1-Mth Reversal	Estimate Revision	ROC
Utilities	Price to Sales, Historical Relative P/E, Fwd P/E	Relative Strength - 10W/40W, Relative Strength - 30W/75W	PEG Ratio, Estimate Revision	ROE (1-Yr)

	EARLY CYCLE Rebounds	MID CYCLE Peaks	LATE CYCLE Moderates	RECESSION CYCLE Contracts
FINANCIALS	+			
REAL ESTATE	++			––
CONSUMER DISCRETIONARY	++	–	––	
INFORMATION TECHNOLOGY	+	+	––	––
INDUSTRIALS	++			––
MATERIALS	+	––	++	
CONSUMER STAPLES			++	++
HEALTH CARE	––		++	++
ENERGY	––		++	
COMMUNICATION SERVICES		+		–
UTILITIES	––	–	+	++
	Economically sensitive sectors may tend to outperform, while more defensive sectors have tended to underperform.	Making marginal portfolio allocation changes to manage drawdown risk with sectors may enhance risk-adjusted returns during this cycle.	Defensive and inflation-resistant sectors tend to perform better, while more cyclical sectors underperform.	Since performance is generally negative in recessions, investors should focus on the most defensive, historically stable sectors.

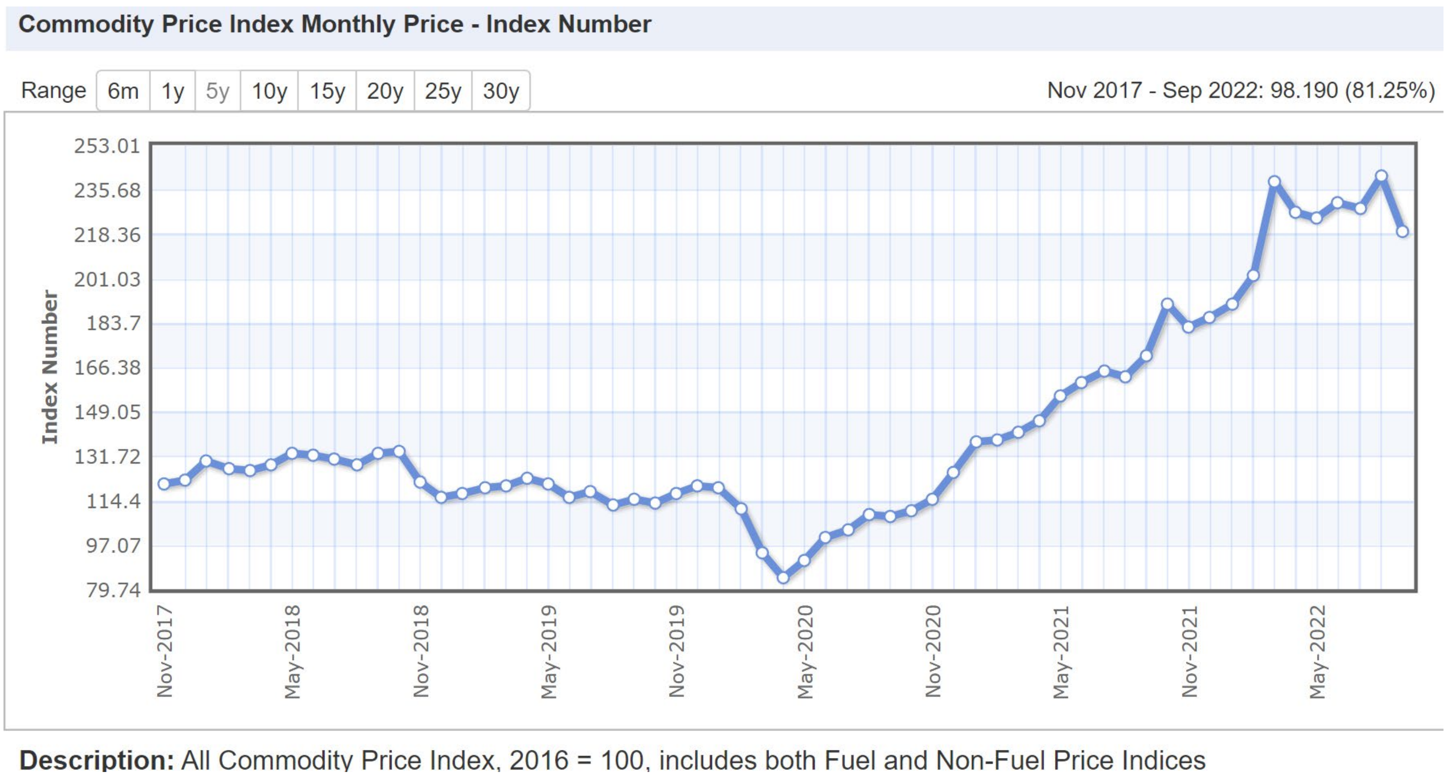
	EV/ Sales			Revenue Growth		P/E			EPS Growth		EV/ EBITDA		Net Debt/ EBITDA		FCF Yield	
Company	CY22E	CY23E	CY24E	CY23E	CY24E	CY22E	CY23E	CY24E	CY23E	CY24E	CY22E	CY23E	CY22E	CY23E	TTM	CY22
Communication Services Average	3.1x	2.9x	2.7x	6%	6%	24.9x	22.6x	16.1x	19%	23%	12.7x	11.3x	2.2x	2.2x	11%	4%
Consumer Discretionary Average	2.7x	2.4x	2.2x	9%	7%	15.5x	22.3x	15.2x	(8%)	38%	13.9x	12.4x	3.3x	2.9x	6%	3%
Consumer Staples Average	3.1x	3.0x	2.9x	3%	4%	22.4x	20.3x	18.5x	8%	8%	15.7x	14.5x	2.3x	2.2x	5%	3%
Energy Average	2.6x	2.6x	2.7x	(2%)	(2%)	12.5x	11.5x	12.1x	1%	(6%)	7.0x	7.0x	1.2x	1.2x	6%	9%
Financials Average	4.0x	3.7x	3.5x	7%	6%	16.6x	14.1x	12.5x	20%	11%	15.4x	14.7x	1.5x	1.5x	11%	5%
Healthcare Average	5.0x	4.9x	4.6x	2%	6%	25.0x	23.3x	20.8x	4%	11%	17.6x	16.9x	1.2x	1.1x	6%	5%
Industrials Average	3.3x	3.2x	3.0x	3%	5%	19.5x	19.8x	17.4x	(6%)	15%	-14.5x	13.7x	-6.4x	1.9x	4%	3%
Technology Average	6.1x	5.6x	5.0x	5%	10%	24.1x	22.9x	18.2x	5%	21%	17.1x	15.9x	0.8x	0.8x	5%	4%
Materials Average	2.6x	2.5x	2.6x	1%	0%	17.1x	16.6x	15.4x	(1%)	7%	11.0x	10.5x	1.8x	1.7x	7%	5%
Real Estate Average	11.5x	10.9x	10.4x	5%	5%	69.9x	44.0x	37.2x	22%	15%	19.1x	18.0x	5.3x	4.9x	4%	3%
Utilities Average	4.9x	4.8x	4.6x	3%	4%	18.7x	17.7x	16.5x	5%	8%	13.0x	11.9x	5.5x	5.0x	NA	(1%)

Basic Materials

The materials group is one of my least favorite areas to invest/trade due to the cyclical nature and number of external factors that are less predictable. The stocks tend to move in correlation with commodity prices, whether it be a mining company with metal prices, an energy company with oil/gas prices, or a materials company impacted by costs of commodities impacting its margins and bottom-line. It is a group that is very sensitive to inflation, currency movements, and global macroeconomic data. Demand is strongly correlated with the strength of the global manufacturing economy.

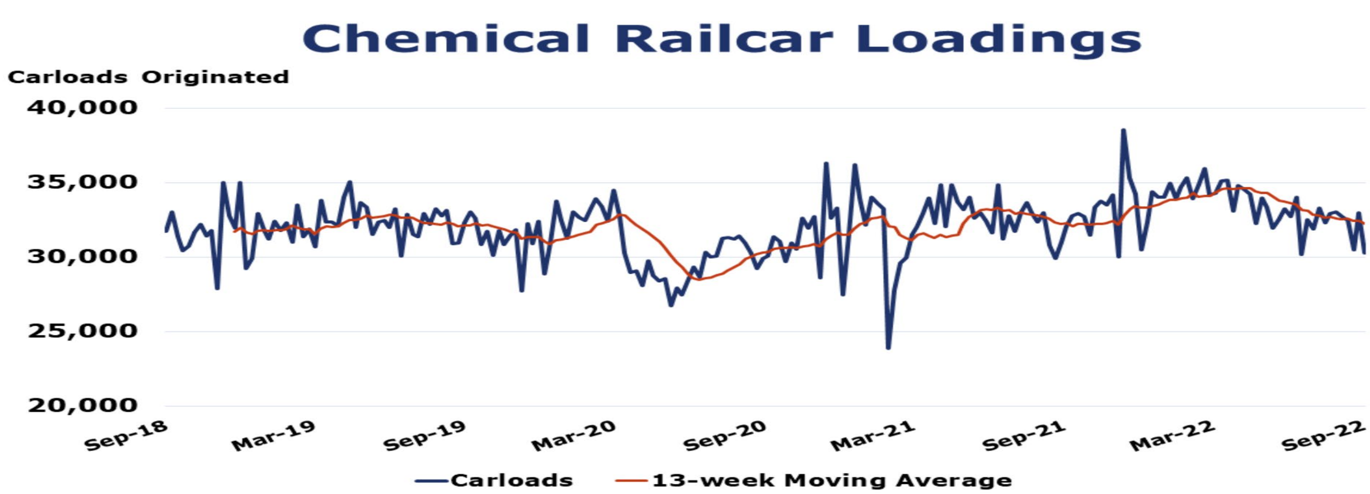
2023 Basic Materials Sector Outlook

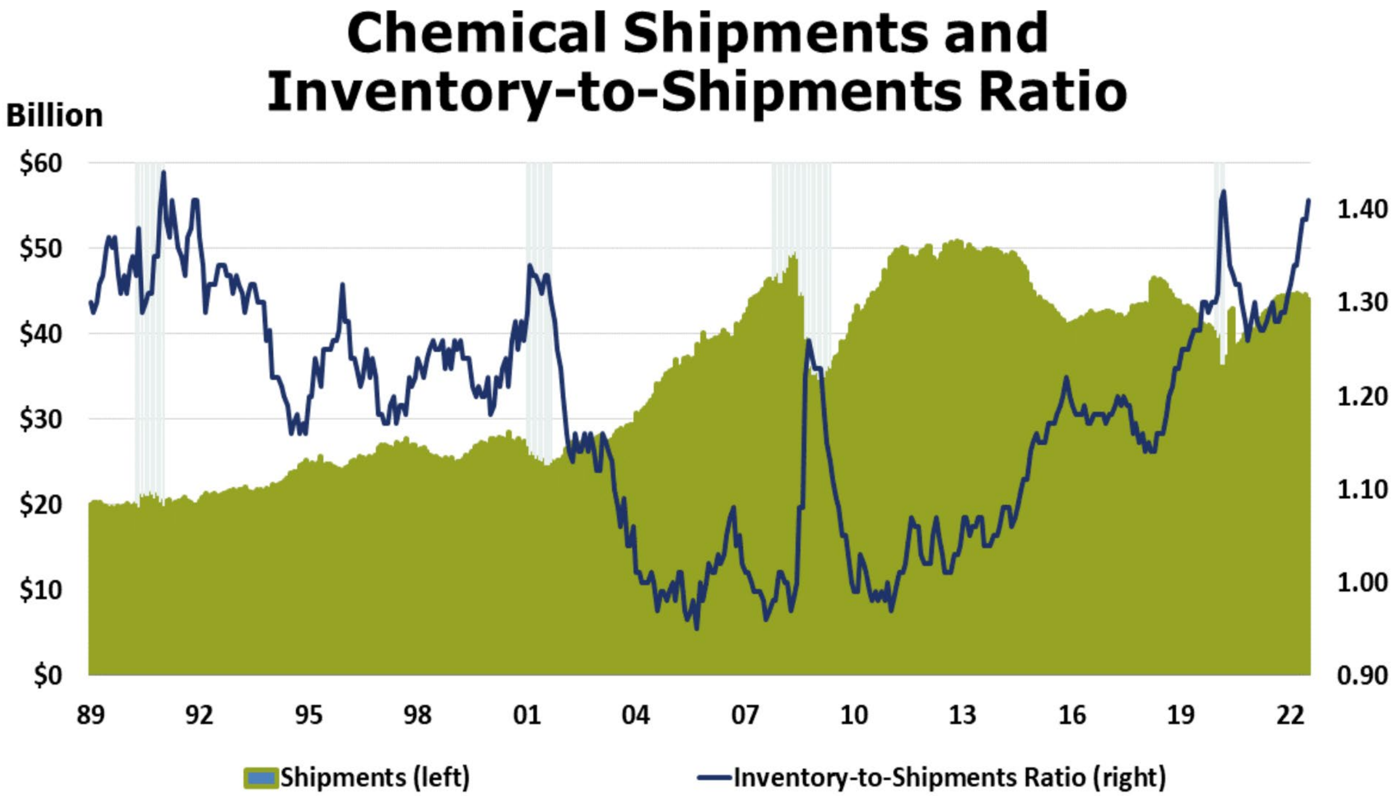
Commodity Price Index Chart



Chemicals

Chemical Activity Barometer Chart





Chemicals – Diversified & Commodity

Resources: Chemical Week, ICIS, American Chemistry Council, ChemOrbis

Components: DD, DOW, EMN, HUN, HWKN, ASH, CE, LYB, NEU, BAK, IOSP, GPRE, FF, UNVR

International & Private Peers: BASF, Covestro, Wacker, Arkema, Sinopec, Sabic, Ineos, Formosa Plastics, Exxon Chemical, Mitsubishi Chemical, LG Chem, Reliance Industries, Petro-China, Toray Industries, Evonik, Bayer, Sumitomo Chemicals, Lotte Chemical, Solvay, Lubrizol Corporation, Infineum, Dorf Ketal

Intro

This group saw mixed performance in 2022 with former standout Celanese (CE) one of the worst performers down 40% and Eastman (EMN) was down 30%. Univar (UNVR) in the news recently with M&A interest while Lyondell (LYB) and Ashland (ASH) notable outperformance.

U.S. chemical producers grew by 3.9% in 2022, but chemical output is expected to fall by 1.2% in 2023. Chemical industry capital spending grew 9.0% to $33.5 billion this year with higher spending on capacity expansions, upgrades, and sustainability projects – including significant investments in lower emissions technologies and advanced recycling. Growth in capital spending is expected to slow to 3.6% next year.

Chemical names are seeing 2023 estimates revised lower on a weaker Macro outlook while challenges such as Ukraine/Russia causing an energy crisis in Europe and China lockdowns two major headwinds that have potential to clear in 2023. PE is likely the weakest of the major chains with ~12% new N. American capacity being added in 2022/23 as demand remains soft. Commodity chemicals are likely to see continued pressure though valuation would argue not much more absolute downside risk. The combination of significant new capacity, weak demand, and high inventory levels means that PE will be one of the most challenged chemical chains over the next year.

Industry Analysis

Cyclical - Historically, ethylene equities trade at a range of 5x-9x EBITDA across the cycle, with multiples trading inversely to earnings levels. Thus, multiples are highest toward the bottom of margin cycles and lowest at the margin peak of the commodity cycle. Unlike other cyclical industries where you can add one new production line at a time and cyclicality is driven primarily by demand; chemical capacity adds often need to be very large world scale plants to drive down unit cost. This often results in supply driving cyclicality.

End-Markets: The end-markets for various chemical chains vary significantly. For example, TiO2 sees nearly 60% of its consumption in paints and coatings while polyethylene sees a majority of its consumption in packaging.

	Global Chemicals				
	DOW	lyondellbasell	EASTMAN	Celanese	Ashland always solving
Ticker	DOW	LYB	EMN	CE	ASH
End Market Exposure					
Autos & Transport	15%	30%	21%	25%	-
Consumer Goods & HPC	15%	15%	15%	20%	31%
Electronics	15%	-	2%	10%	-
Food & Feed/Bev	-	-	7%	5%	-
Healthcare	-	-	-	-	27%
Housing & Construction	20%	10%	14%	25%	20%
Manufacturing	-	-	10%	-	14%
Metals & Mining	-	-	-	-	-
Oil & Gas	-	25%	5%	-	2%
Paper & Packaging	5%	15%	-	-	-
Plastics	20%	-	15%	-	-
Other	10%	5%	11%	15%	6%
Geographic Exposure					
Asia/Pacific	23%	13%	25%	27%	19%
Americas	46%	56%	48%	33%	49%
Europe	23%	27%	17%	39%	32%
Africa/Middle East	9%	4%	11%	1%	0%

Industry Backdrop & Investment Considerations

Supply/Demand – Pricing – Margins; Tight Macro Correlations (ISM); Supply Disruptions

Auto production, housing/building & construction, and the resiliency of the global consumer are all key end-markets to monitor on the Macro side.

Cost matters for chemical production but probably more important than absolute cost is relative cost. The U.S. industry based on natural gas versus the European and Asian industries based on oil enjoys a significant cost advantage. Brent oil-to-Henry Hub gas is a key indicator of the health of the U.S. industry.

Inventory swings in chemicals can be drastic and often catch both investors and the industry itself by surprise. Inventory destocking or restocking can have a 1-2% impact in a given year on apparent demand. North American polyethylene supply had a CAGR of ~6% over the 2014–2019-time frame, driven by an advantaged feedstock (i.e., shale gas) and a similar growth rate in demand. Over the 2019-2023 window, supply should slightly outpace demand (CAGR of 5% vs 4% for demand) according to Chemical Market Analytics.

Indicators, Metrics & Stock Selection Framework

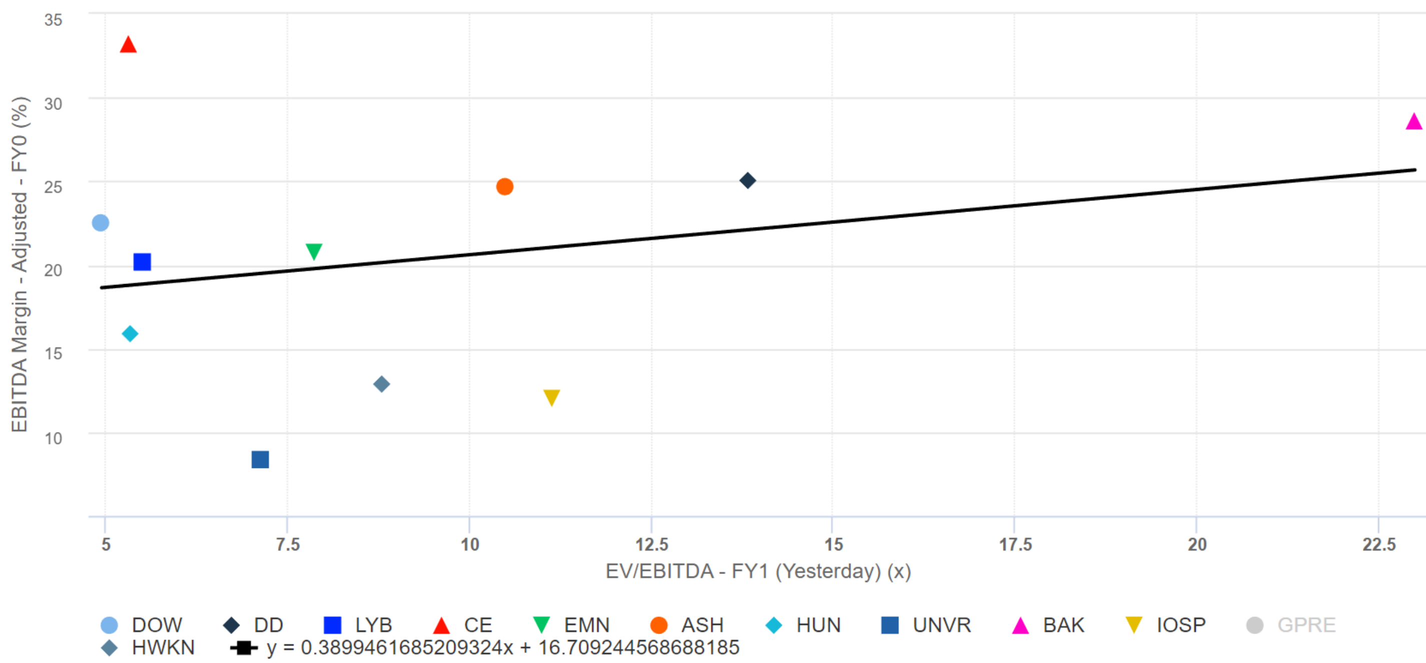
PMI, Industrial Production Index

EV/EBITDA, EBITDA CAGR, Revenue CAGR, EBITDA Margins, ROIC, FCF Yield, EBITDA to Cash Flow Conversion (CFFO), Net Debt to EBITDA

Cost Structure & Cash Conversion

Valuation & Comps

EV/EBITDA to EBITDA Margins



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Commodity Chemicals							#VALUE!		
ASH	Ashland Inc	6.0B	10.50X	6%	11.19%	23.26%	6.60%	(12.652%)	2.02X
BAK	Braskem SA (ADR)	4.0B	22.99X	96%	(2.997%)	7.75%		17.57%	1.29X
CE	Celanese Corporation	11.1B	5.31X	25%	5.72%	26.38%	8.55%	25.82%	1.00X
DD	DuPont de Nemours Inc	34.2B	13.82X	-14%	9.1%	25.81%	1.76%	(8.892%)	2.62X
DOW	Dow Inc	35.3B	4.94X	30%	12.32%	13.2%	13.25%	17.41%	0.96X
EMN	Eastman Chemical Co	10.2B	7.87X	4%	7.67%	16.61%	4.26%	8.12%	2.24X
FF	FutureFuel Corp.	0.4B		-44%		16.51%		(50.043%)	-9.07X
GPRE	Green Plains Inc	1.7B	90.06X		40.26%	(3.72%)	-16.70%	(6.854%)	2.65X
HUN	Huntsman Corporation	5.4B	5.35X	26%	8.11%	13.48%	12.01%	14.02%	0.39X
HWKN	Hawkins, Inc.	0.8B	8.80X	26%	(3.132%)	13.83%		10.31%	1.09X
IOSP	Innospec Inc.	2.7B	11.13X	-5%	5.6%	11.54%		10.46%	-0.69X
LYB	LyondellBasell Industries NV	26.5B	5.51X	28%	1.9%	9.73%	14.48%	21.41%	1.27X
NEU	NewMarket Corporation	3.1B		-10%		14.35%		4.53%	1.72X
UNVR	Univar Solutions Inc	5.3B	7.14X	6%	11.81%	8.7%	7.28%	9.13%	2.68X

Management Commentary

Lyondell (LYB) on the importance of China… "And then we're hopeful that China, which has been kind of missing in action for the better part of a year actually starts to demonstrate growth again. And so that's important from a global GDP perspective. But as you know, China is the world's largest consumer of petrochemicals, in particular, polyethylene, which is our biggest business. And so China growth actually has to come back. We hope that, that starts to happen in spring, so in the second quarter. And then -- so assuming that -- assuming China comes back and just as a reminder, polyethylene growth in China over the last decade call it, kind of 5% to 6%. This year, our perspective is kind of close to 1%. They've added significant capacity. So China needs to come back for global growth, but also to improve petrochemical margins."

OptionsHawk Executive Summary & Focus Stocks

The cyclicality of this group makes it a tougher one to have confidence into a weakening 2023 Macro, but **DuPont (DD)** is the favored large cap with its more growth-oriented portfolio transformation and higher margin profile. **Ashland (ASH)** is the favorite of the smaller cap names with strong margins and one of the best growth outlooks for EBITDA. **Dow Chemical (DOW)** is the value-name at less than 5X EBITDA and a balance sheet at < 1X Debt/EBITDA.

Chemicals – Industrial Gases & Electronic Chemicals

Resources: GasWorld,

Components: APD, LIN, MEOH, ESI, LWLG

International & Private Peers: Air Liquide, KMG Chemicals, JSR Corp., BASF, Honeywell, Fujifilm, Hitachi Chemical, Solvay

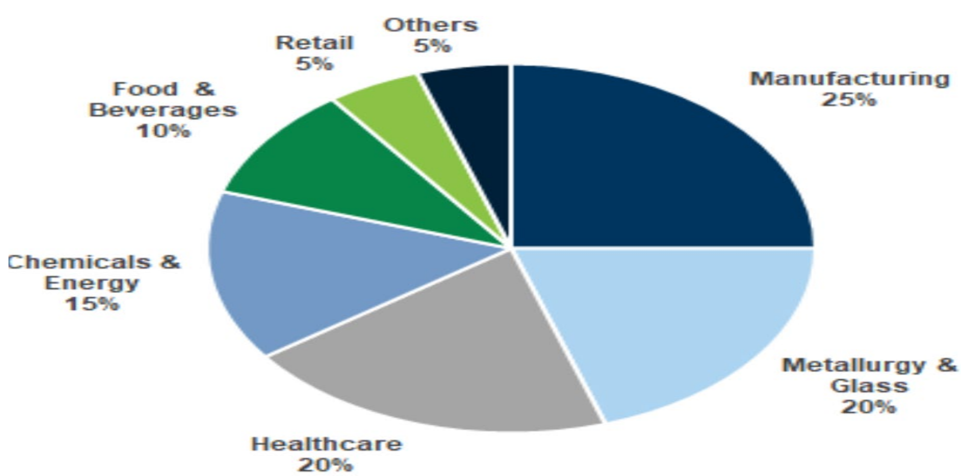
Intro

In a tough year for Chemicals the large industrial gas names held up well and continue to see positive benefits from the hydrogen movement which will be further boosted by the IRA. Pricing momentum in the industrial gas industry has been very strong over the last two years as inflation has historically been a positive influence on industrial gas pricing.

Industry Analysis

The industrial gases industry is heavily concentrated with APD at 12% share, Air Liquide at 27%, and Linde at 31%. The global industrial gases market size was valued at $92B in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 6.0% from 2021 to 2028. APD has greater exposure to the on-site distribution model with long-term contracts (i.e., 15-20 years), which provides downside earnings protection, while LIN has greater exposure to shorter term contracts for merchant gas and packaging gas (i.e., 3-5 years for merchant and less for packaging), which affords greater leverage to upswings in industrial production given that LIN could be better positioned to benefit from rising price and volumes.

Capital intensity, high cost to transport and long-term contracts create high barriers to entry for this industry. The key products that are separated from air include nitrogen, oxygen, argon, argon, and noble gases (i.e., neon, krypton, and xenon). Other key products are hydrogen and helium, but they are separated from natural gas. These products serve very diverse end markets



Industry Backdrop & Investment Considerations

Gasification; Hydrogen for Mobility; Carbon Capture

IGs take-or-pay contracts and resilient end-markets enable these companies to generally outperform during downturns. Additionally, the Inflation Reduction Act (IRA) should be a significant boost for their business. With 30-40% of industrial gases demand from end-markets with consumer exposure and influenced by consumer spending, YoY sales growth over the past 20 years has trended very closely with YoY changes in GDP

Transition to lower carbon fuels - Industrial gas producers (APD, LIN) have been facilitating lower carbon fuels for a decade + and are well positioned to accelerate industry transition. Providing grey hydrogen via pipeline networks to refineries in order to meet lower sulfur and particulate mandates has been a backbone of these businesses.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, FCF Yield

Valuation & Comps

EV/EBITDA to EBITDA Margins

Given the predictable returns and stable margins with GDP and industrial production like growth, industrial gases stocks have historically traded at a 20-30% premium to the S&P 500 on a forward P/E multiple basis

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Industrial Gases							#VALUE!		
APD	Air Products & Chemicals, Inc	69.8B	16.27X	8%	11.05%	32.06%	-1.83%	5.13%	0.73X
LIN	Linde PLC	164.2B	16.30X	12%	7.44%	34.73%	3.53%	6.11%	1.17X
MEOH	Methanex Corp (USA)	2.6B		40%	22.05%	18.97%	#VALUE!	12.39%	1.89X
ESI	Element Solutions Inc	4.6B	11.79X	12%	6.21%	21.58%	#VALUE!	7.48%	2.67X
LWLG	Lightwave Logic Inc	0.8B		106%			#VALUE!	(849.854%)	0.88X

Management Commentary

Air Products (APD) on the importance of the IRA…"Let's talk about the IRA. And I'll get to the specific projects. But I think when we step back at this, we're going to really look at this as kind of a seminal moment where the U.S. committed, no kidding, energy transition is real. Hydrogen has a critical role to play in that. So again, I think, it supports our strategy that we've been talking about for a couple of years. But it really signals not only to the U.S., but it also signals to the rest of the world that the U.S. is very serious about this. But I absolutely believe IRA will open up additional investment opportunities in the United States. That doesn't mean to say there aren't opportunities around the rest of the world, but certainly, the U.S. is more attractive because one of the great things about the IRA is it doesn't pick technology solutions. It sets up incentives based on carbon intensity."

Linde (LIN) on stability and end-markets… "Resilient end markets, which make up about 1/3 of sales, are collectively growing double-digit percent with food, beverage and electronics up almost 20% and health care slightly down from prior year pandemic volumes. Our gases are critical for the production and packaging of everyday consumer items such as food, carbonated beverages, respiratory applications and electronic components. These volumes track to broad consumption levels rather than specific technologies or trends. So they are quite stable even during volatile economic periods. Furthermore, despite what you may be reading in the news, we continue to see healthy supplies of gases into electronics fabs in every region. In fact, our total electronics project backlog increased to $1.4 billion after recently being awarded a second large sale of gas contract for a major semiconductor manufacturer in the U.S. And almost 60% of sales, the cyclical end markets are also up double-digit percent. While growth is broad-based, we continue to see strength in mining for battery materials; merchant hydrogen sales; aerospace, including commercial space; and general manufacturing, especially in Americas. The IRA has accelerated significant growth prospects from our unrivaled hydrogen and atmospheric gas network as well as potential new markets being developed across the U.S. With this effect, we've grouped these activities into 3 different categories of Decarbonized Linde, Decarbonized Customers and New Markets."

OptionsHawk Executive Summary & Focus Stocks

In this small group we are essentially looking at the two large cap quality names which have very similar profiles. **Linde (LIN)** has performed better the last couple years but **Air Products (APD)** has a modestly better forward growth outlook and lower leverage, so is the preferred name in 2023. **Element Solutions (ESI)** is a potential small cap winner on the 5G rollout and increasing electronic content in automotive systems but looks fairly valued currently.

Chemicals – Specialty

Components: IFF, WLK, OLN, BCPC, CBT, FUL, SXT, AIN, KWR, NGVT, SCL, WDFC, CSWI, MTX, MTRN, ECVT, OEC, CCF, KOP

International & Private Peers: Solvay, KMG Chemicals, Senju Metal, Uyemura International, Miraclon Corp., Flint Group, Univation, Lummus Novolen Technology, Johnson Matthey, Haldor Topsoe, UOP, Inovyn, KEM ONE, Hexion, Kuraray Co, Osaka Gas Chemicals and Axens

Intro

The specialty chemical group saw mostly weak performances in 2022 outside of a strong year for Cabot (CBT) and Westlake (WLK) as a deep value name held up.

Industry Analysis

We can see below the diversified products across the specialty chemicals industry. The global specialty chemicals market is expected to grow at a compound annual growth rate of 4.3% from 2020 to 2028 to reach $825B by 2028. These chemicals are performance-oriented and typically include customer/technical servicing as an aspect of their sales.

Industry Backdrop & Investment Considerations

Given that the chemical industry is cyclical with long-term growth in-line with GDP or Industrial Production depending on portfolio mix, cycle timing or calling the cycle is key to investing in this space. Pricing is always a key factor for margins requiring close analysis of the supply & demand environment.

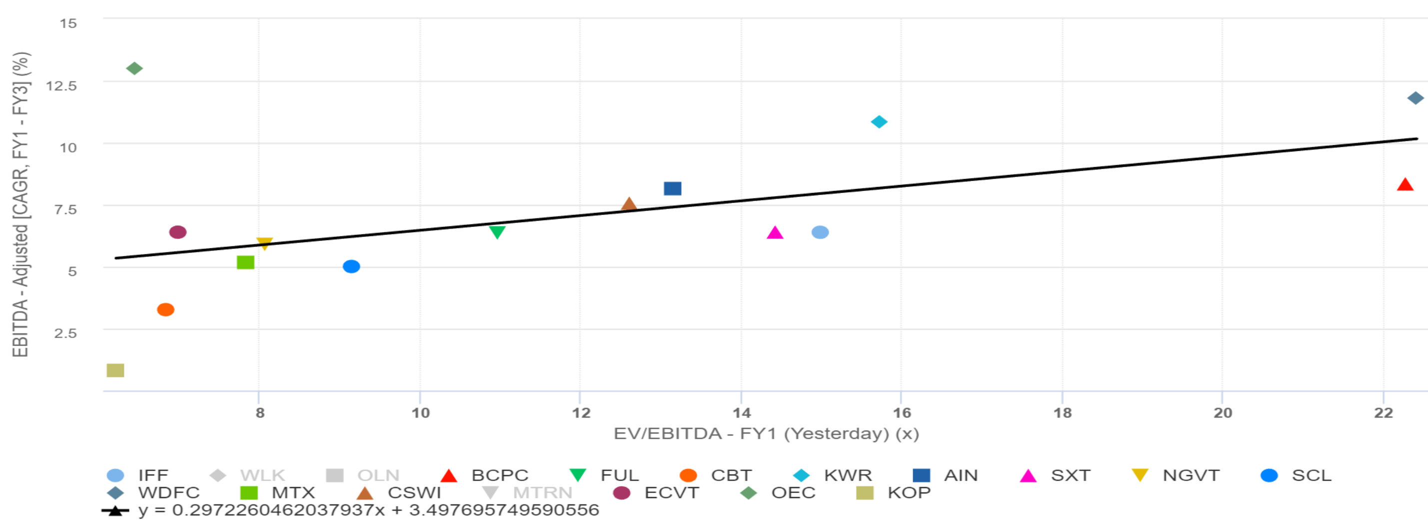
Chloralkali is one of the chemical chains where no material new supply is anticipated until 2024, which could keep supply and demand relatively balanced over the next year. Equally important, the market leader, OLN, has implemented a strategy to manage supply during periods of slowing demand to dampen industry pricing volatility. Consumer spending is a key metric for chloralkali given that products from one of its largest end markets, Vinyls, are key inputs in consumer products such as automobiles, housing, appliances, and food packaging. Globally, chloralkali supply and demand has remained relatively balanced with compounded annual growth rates (CAGR) of ~3% since 2000. The chloralkali industry has undergone watershed changes such as market leaders focusing more on value versus volumes, especially in periods of slower demand, which could support more rational behavior in choppy markets than historical behavior.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, FCF Yield

Valuation & Comps

EV/EBITDA to EBITDA CAGR



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Specialty Chemicals							#VALUE!		
IFF	International Flavors & Fragra	27.3B	14.99X	29%	14.57%	19.98%	2.24%	2.9%	3.91X
WLK	Westlake Corp	13.6B	3.98X	61%	(53.157%)	19.87%	16.87%	19.14%	0.76X
OLN	Olin Corporation	7.4B	4.02X	63%	31.43%	23.59%	20.71%	23.0%	1.26X
BCPC	Balchem Corp	4.2B	22.28X	9%	5.85%	22.01%	#VALUE!	10.69%	0.24X
FUL	H.B. Fuller Company	4.1B	10.97X	4%	4.67%	14.63%	2.03%	4.97%	3.47X
CBT	Cabot Corp	4.0B	6.83X	35%	3.27%	16.01%	6.51%	15.15%	1.53X
KWR	Quaker Chemical Corp	3.2B	15.72X	26%	(0.266%)	14.28%	#VALUE!	4.53%	2.62X
AIN	Albany International Corp.	3.1B	13.15X	-3%	11.7%	26.12%	2.45%	9.29%	0.47X
SXT	Sensient Technologies Corpo	3.1B	14.42X	4%	9.42%	17.82%	1.43%	4.64%	2.04X
NGVT	Ingevity Corp	2.7B	8.07X	3%	1.79%	28.67%	6.04%	12.52%	2.40X
SCL	Stepan Company	2.5B	9.15X	10%		11.85%	#VALUE!	10.92%	0.10X
WDFC	WD-40 Company	2.3B	22.41X	3%	11.8%	16.64%	0.03%	9.61%	0.72X
MTX	Minerals Technologies Inc	2.0B	7.83X	1%	6.08%	16.63%	#VALUE!	7.74%	1.87X
CSWI	CSW Industrials Inc	1.8B	12.60X	30%	7.56%	23.03%	#VALUE!	8.84%	1.69X
MTRN	Materion Corp	1.7B	11.36X	6%	(33.228%)	11.4%	1.91%	7.4%	1.77X
ECVT	Ecovyst Inc	1.2B	6.98X	-31%	8.35%	32.43%	10.41%	(15.082%)	4.49X
OEC	Orion Engineered Carbons SA	1.1B	6.44X	0%	(0.936%)	14.82%	-14.05%	10.72%	2.67X
CCF	Chase Corporation	0.9B		13%		26.12%	#VALUE!	18.17%	-1.54X
KOP	Koppers Holdings Inc.	0.6B	6.20X	3%	(4.163%)	12.83%	#VALUE!	8.33%	3.30X

Management Commentary

Westlake (WLK) on cost advantages and building markets… "Our energy and feedstock advantage in North America, where over 85% of our global production capacity is positioned, provided opportunities to reach export markets as domestic construction and building demand for PVC in the U.S. slowed. Thus, our product portfolio with the concentration in North America continues to leverage the benefits from the structural cost advantage in feedstocks, fuel and power. This cost advantage, combined with ability to scale our operations to meet market conditions, puts Westlake in a good position to navigate through this challenging economic environment. Slowing demand for PVC and building products tighten markets for chlor-alkali, and thus, improve the markets for caustic soda. As a leading chlor-alkali producer in North America, pricing strength in caustic soda position us to capture strong margins in the quarterly -- in this quarter, partially offsetting lower margins in our other products. Our leading positions in large diameter PVC pipe and fittings continued to perform well in the third quarter and is well situated to benefit from government spending and infrastructure projects for years to come."

OptionsHawk Executive Summary & Focus Stocks

Westlake (WLK) once again screens as an attractive value at 4X EBITDA while generating strong FCF, solid margins and a leading ROIC. The hesitation is WLK likely has to work off a peak year of EBITDA with forecasts for a 28% decline in 2023. **Olin (OLN)** stands out as cheap at 4X EBITDA while having a strong EBITDA growth forward outlook and excellent margins and ROIC. **Albany (AIN)** another small cap that screens favorable on an annual basis and benefitting from a strengthening Aerospace recovery. **Ingevity (NGVT)** a potential value small cap with standout margins and FCF despite a muted growth outlook and **CSW Industrials (CSWI)** a high quality name in this group with growth slowing but still operates with standout metrics.

<u>Chemicals – Coatings & TiO2</u>

Resources: Coatings World, Orr & Boss,

Components: PPG, AXTA, SHW, RPM, ASIX, CC, TROX, KRO, VHI

International & Private Peers: AkzoNobel, Nippon Paint, BASF, Kansai Paint, Jotun, Hempel, DAW, Diamond Vogel

Intro

It was a tough year for coatings with the slowdown in the housing market weighing on remodel/repair while also dealing with supply chain and inflationary pressures. There is a general demand weakness in the coatings industry, particularly in Europe and Asia, that mirrors the weakness in broader chemicals and will likely cause earnings to be volatile over the next several quarters.

Industry Analysis

Coatings is a broad category of products that range from basic house paint to specialized nano coatings that have radar disrupting properties for stealth aircraft. Architectural (or Decorative) paint is the largest volume and largest dollar value coating product. It is also the product that drives the majority of investor sentiment around the coating space.

Industry Backdrop & Investment Considerations

Pricing vs. Raw Material Inflation – This is a key debate within the industry currently as companies look to navigate inflation and supply chain headwinds. Supporting the price-raw argument, coatings is an industry with a very strong structural set-up relative to the chemical space and an industry that still has several markets that have not rebounded fully to pre-Covid levels (e.g., aerospace, light vehicle OE, light vehicle refinish, etc). The increase in the cost of goods sold for coatings and the ensuing push to offset that cost with increased price is the key story in the paints and coatings space. Coatings has two main components of cost: 1) oil/gas/coal derivatives that provide solvents, resins, additives, and 2) pigments, primarily TiO2. The carbon based raw materials have been by far the largest source of inflation for coatings. The coatings industry has a long history of being able to offset cost inflation with price increases and then holding onto price when eventually raw materials recede.

Demand has continued to weaken throughout Q3 and that coupled with the potential for inventory built over the summer to be released in a year-ending destock has the potential to leave the starting point for 2023 at a much lower level than currently forecast. Capacity in the coating space has very little impact on market dynamics.

Housing Strength Correlation - Improved affordability bodes well for paint stores volumes.

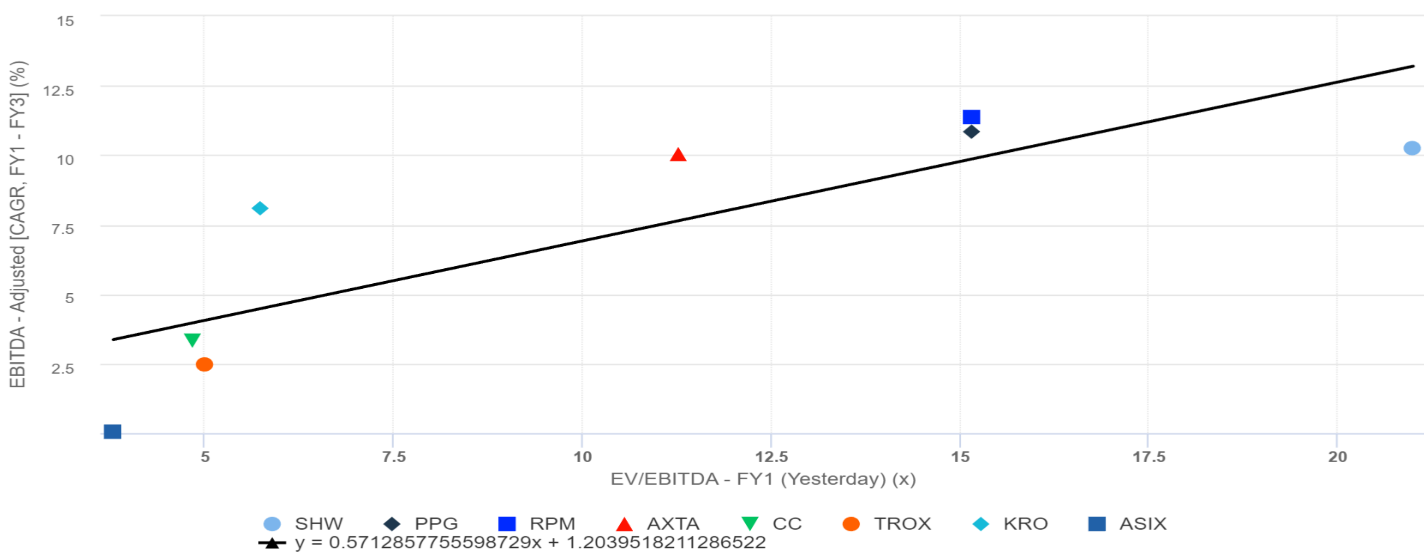
Chloralkali and TiO2 have seen major changes that make them more rational industries than they were historically.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, FCF Yield, EBITDA Growth, Debt to EBITDA

Valuation & Comps

EV/EBITDA to EBITDA Margins



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
SHW	Sherwin-Williams Co	65.5B	21.00X	3%	4.19%	18.59%	2.17%	13.95%	2.68X
PPG	PPG Industries, Inc.	30.6B	15.15X	-1%	8.03%	14.21%	3.51%	10.1%	1.83X
RPM	RPM International Inc.	13.4B	15.16X	5%	11.37%	16.23%	3.52%	6.47%	2.66X
AXTA	Axalta Coating Systems Ltd	5.7B	11.27X	-5%	3.95%	17.96%	2.99%	9.26%	3.26X
CC	Chemours Co	4.5B	4.84X	13%	7.83%	20.43%	13.03%	14.34%	1.99X
TROX	Tronox Holdings PLC	2.2B	5.00X	24%	35.55%	27.6%	6.73%	6.82%	2.67X
KRO	Kronos Worldwide, Inc.	1.2B	5.75X	8%	88.94%	8.57%	#VALUE!	3.22%	0.38X
ASIX	AdvanSix Inc	1.1B	3.78X	48%		6.96%	13.49%	19.04%	0.75X
VHI	Valhi, Inc.	0.7B		15%		9.51%	#VALUE!	13.61%	0.32X

Management Commentary

Sherwin Williams (SHW) on its outlook… "Within The Americas Group, demand is strong across all of our pro-architectural markets, including new residential, despite higher interest rates, with customers reporting strong backlogs that will take them through the end of the year and likely longer. We also see a unique opportunity to continue winning new business as our competitors transition their pro contractor business models and our differentiated model has never been more on display in value than it is today. We expect slowing new residential demand with elevated interest rates and other costs that are impacting new single-family home permits and starts. However, multifamily production has maintained strong momentum. It's also clear that macro headwinds are likely to continue and potentially worsen in Europe and China."

OptionsHawk Executive Summary & Focus Stocks

This is an intriguing group into 2023 with consensus estimates already down sharply and some of the major headwinds abating but demand-concerns as issue while pricing power should keep margins strong. The deceleration of growth is likely to weigh on multiples in a tough comps environment. **RPM International (RPM)** has been operating better than its peers and remains attractively valued while Sherwin Williams (SHW) still trades at a premium. RPM has a better growth outlook and higher FCF yield. **Axalta (AXTA)** is constantly in focus as an obvious M&A target. Weak outlooks and destocking keep me away from the TiO2 plays as estimates are likely to move lower but **Chemours (CC)** would be the name that stands out of a combination of margins, FCF and ROIC.

Chemicals – Ag & Fertilizer

Components: NTR, CTVA, CF, FMC, MOS, ICL, AVD, AMRS, SMG, CMP, UAN, IPI, LXU

International & Private Peers: Bayer, BASF, Yara, Haifa, K&S, Uralkali

Intro

It was a strong year for the Fertilizer names and the supply/demand situation remains tight with strong pricing. Fertilizer equities have generally been range-bound since the immediate aftermath of Russia's invasion of Ukraine. The overall trajectory of fertilizer prices is likely be governed by geopolitical developments in Russia/Ukraine (e.g., bans on Belarusian potash, natural gas flows, export restrictions) and to a certain extent China (e.g., covid lockdowns, export restrictions).

Industry Backdrop & Investment Considerations

Lower corn output in the US, EU, and Ukraine (together responsible for 40% of global supply) should put the 2022/23 corn market in its largest deficit in 30 years. This should lend support for higher grain prices for longer as inventory levels fall to historical averages and amid still uncertain yields in the southern hemisphere. The corn market looks tighter and should drive soybean prices, too, as the crops compete for acreage in the summer.

Fertilizers trends have been somewhat divergent between nutrients, with cost-curve pressures from EU natural gas supporting N prices through the quarter, while elevated inventories and uneven regional demand have tempered potash & phosphate prices. For crop protection, elevated crop prices have continued to be supportive to demand that should result in both solid volume trends and supportive of additional pricing actions.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, FCF Yield, EBITDA Growth, Debt to EBITDA

Valuation & Comps

EV/EBITDA to ROIC

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Ag & Fertilizer							#VALUE!		
CTVA	Corteva Inc	45.0B	14.95X	14%	9.73%	3.46%	2.62%	5.63%	-1.19X
NTR	Nutrien Ltd	40.3B		33%	(16.791%)	30.13%	#VALUE!	7.77%	1.42X
CF	CF Industries Holdings, Inc.	19.4B	3.77X	30%	(25.027%)	42.35%	19.27%	11.61%	0.93X
FMC	FMC Corp	15.9B	13.62X	4%	5.6%	18.95%	3.52%	13.05%	2.02X
MOS	Mosaic Co	15.9B	2.86X	63%	(24.595%)	31.52%	19.62%	13.1%	0.84X
ICL	ICL Group Ltd.	10.8B	3.30X	17%	(25.336%)	41.92%	13.63%	6.93%	1.48X
SMG	Scotts Miracle-Gro Co	2.9B	10.18X	-15%	6.77%	(14.442%)	#VALUE!	2.71%	4.42X
CMP	Compass Minerals Internatioi	1.8B	11.61X	-16%	3.24%	14.03%	1.10%		4.88X
LXU	LSB Industries Inc	1.2B	3.52X	66%	(26.547%)	27.1%	24.40%	37.82%	2.46X
UAN	CVR Partners LP	1.1B		47%		11.16%	#VALUE!	5.78%	2.38X
AVD	American Vanguard Corp.	0.7B	10.63X	9%		12.43%	#VALUE!	4.0%	1.20X
AMRS	Amyris Inc	0.5B	-3.38X	-4%		(200.856%)	#VALUE!	(207.457%)	-0.84X
IPI	Intrepid Potash Inc	0.5B	2.67X	15%	(38.298%)	36.1%	5.82%	4.18%	-0.22X

Management Commentary

Nutrien (NTR) on industry fundamentals… "Global grain supply remains very tight with the stocks-to-use ratio projected to fall to a more than 0.25 century low this crop year. High energy costs and export restrictions continue to impact global fertilizer production and trade, most notably in Europe, and we believe the supply constraints will persist well beyond 2022. We maintained that in a supply-constrained environment, no other producer has an ability like Nutrien to bring on additional low-cost Potash and nitrogen volumes to meet pent-up demand. Therefore, we continue to advance our strategic growth initiatives that are based on a positive multiyear view of the fundamentals. Crop futures have moved higher in recent weeks and are indicative of multiyear strength in the market fundamentals with corn futures trading above $5 per bushel out to December 2025. Prospective crop margins are well above historical average levels, which provides an incentive for growers to increase acreage and push to maximize yields. The weather has been favorable in North America, and we anticipate that the rapid pace of harvest will support a large fall ammonia application season and normal application rates of Potash, phosphate and crop protection products. Our retail fertilizer sales volumes in October were up from the previous year, which is a good early indicator of robust grower demand."

Corteva (CTVA) on restocking and outlook for the Ag economy… "So you've got the conflict with Russia and Ukraine. We've got climate change issues, and we had that COVID hangover in terms of the supply chain, all of that tightened both crop inputs and crop outputs. One difference is by the time we got to this point in the year, we thought that there'd be a restocking happening in the grain and oilseeds markets. And now what we see, the harvest is almost complete. We know that's not going to happen now. And so the setup for 2023, but it's even beyond 2023, I think now that this is going to go into 2024 and perhaps even further. We need to see at least two consecutive years of trend yields, we need to see the rebalancing of stocks and so the setup for 2023 is low inventories. We've got relatively high crop prices, and we have very healthy farmers globally. Next year, we expect margins to be strong again, and they've got great balance sheets and strong liquidity. So the setup for 2023 from an ag economy perspective is quite robust."

OptionsHawk Executive Summary & Focus Stocks

The clear concern in this group for 2023 is that 2022 was a peak cycle year and now faces downward revisions and multiple compression. This makes it difficult to have confidence owning MOS/CF/NTR. **Corteva (CTVA)** and **FMC (FMC)** are the two that will continue to grow through the cycle and positioned well for Ag trends, the latter slightly preferred for its diversified portfolio, higher margins and stronger ROIC. None of the small caps stocks in this group stand out as overly compelling investments, **LSB Industries (LXU)** is extremely cheap at 3.5X EBITDA with 27% EBITDA margins and strong FCF but faces similar peak cycle dynamics as its fertilizer peers. **CVR Partners (UAN)** a potential attractive short coming off peak-cycle earnings while having weaker margins and ROIC to larger peers.

Grains & Ag Products

Resources: World-Grain

Components: ADM, TSN, BG, DAR, PPC, CALM, INGR, BRFS, MGPI, FDP, AVO, ANDE, JBSS, AGRO, DOLE, CVGW

International & Private Peers: Cargill, COFCO, Tate & Lyle, CHS Inc., Louis Dreyfus Group, Glencore International, Wilmar International

Intro

There were a few standouts in 2022 in this group with CALM, MGPI and ADM while Protein names struggled and have a difficult set-up into 2023.

In the latest quarter, Oilseeds value chains were notable standouts, with continued acceleration in North American renewable diesel production underpinning robust domestic soybean crush margins and strong edible oil refining margins. Continued tightness in global grain & oilseed balances and logistics/supply/energy volatility (e.g. low Mississippi River levels, uncertain Black Sea export prospects, EU natural gas processing costs, amongst others) continues to underpin a fertile operating environment.

Industry Analysis

Cal-Maine (CALM) is the largest producer and distributor of shell eggs in the United States. General demand for eggs increases basically in line with overall population growth, averaging about 2% per year. Wholesale shell egg prices are volatile, cyclical, and impacted by a number of factors, including consumer demand, seasonal fluctuations, disease, and by the number and productivity of laying hens in the U.S. Feed is a primary cost component in the production of shell eggs with soy and corn primary ingredients. The egg industry is fairly consolidated with the top ten producers owning 53% of production. **Calavo Growers (CVGW)** is a global leader in the avocado industry along with **Mission Produce (AVO)**. **MGP (MGPI)** is a leading supplier of products/solutions to the alcohol industry as well as a leader in specialty ingredients in starch foods. **Ingredion (INGR)** is a leading global ingredients supplier with a focus of starches and sweeteners. **Fresh Del Monte (FDP)** is a leading producer of fresh-cut fruit and vegetables, as well as a leading producer and distributor of prepared fruit and vegetables, juices, beverages and snacks. **John B. Sanfilippo & Son (JBSS)** is a leading processors and distributors of peanuts, pecans, cashews, walnuts, almonds and other nuts in the United States. **Darling (DAR)** is a green diesel play, an emerging industry of renewable diesel through its Diamond Green Diesel JV with Valero.

Industry Backdrop & Investment Considerations

Rising hog prices and production in China, a market that was a less consistent demand source in 2022 amidst COVID-lockdowns, is also a notable source of upside to global grains & oilseeds into next year.

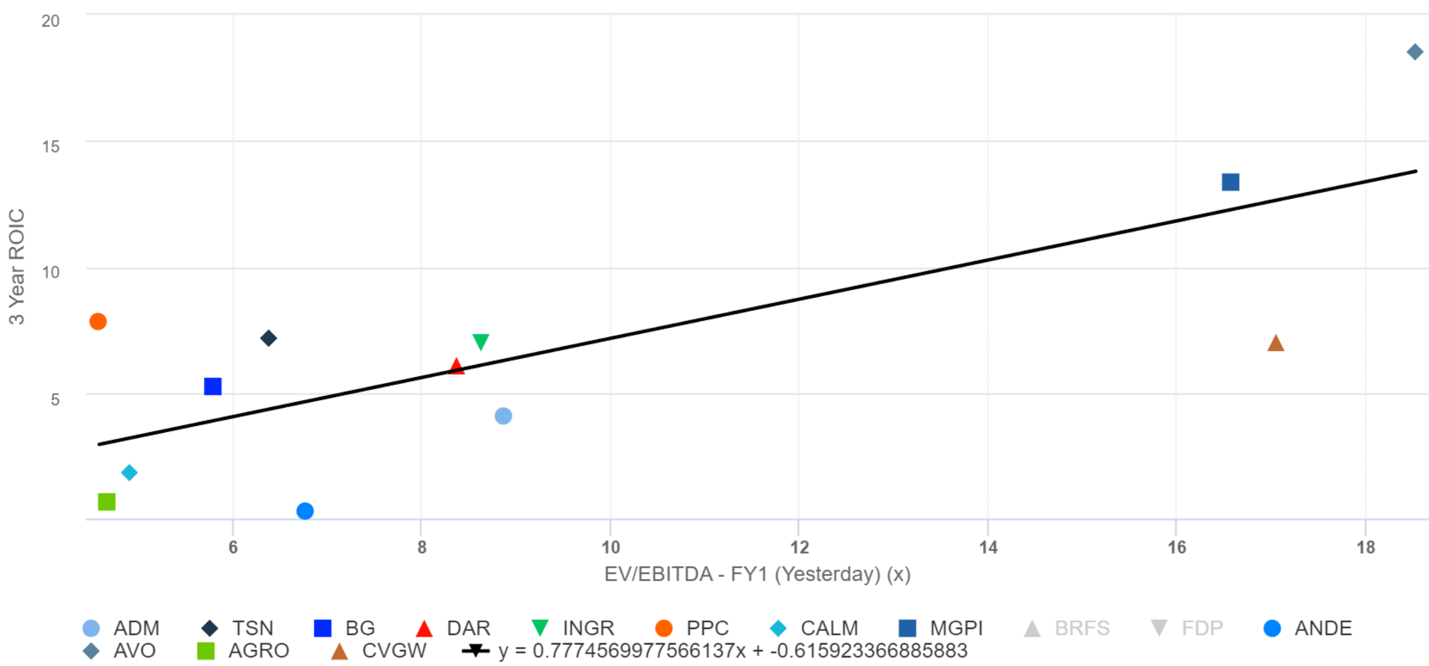
Despite peak cycle returns there are some strong idiosyncratic stories across the group such as renewable diesel and plant-based proteins. Domestic biofuel demand was bolstered by provisions in the *Inflation Reduction Act.*

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, EBITDA CAGR, ROIC

Valuation & Comps

EV/EBITDA to 3 Year ROIC



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/EBITDA
Ag Products							#VALUE!		
ADM	Archer-Daniels-Midland Co	50.5B	8.86X	35%	(10.505%)	6.64%	#VALUE!	7.33%	1.82X
TSN	Tyson Foods, Inc.	22.9B	6.39X	14%	4.38%	8.06%	-0.70%	9.75%	1.25X
BG	Bunge Ltd	14.3B	5.80X	33%	(12.245%)	4.73%	#VALUE!	15.65%	1.65X
DAR	Darling Ingredients Inc	10.0B	8.38X	39%	1.47%	22.59%	6.27%	14.47%	1.66X
INGR	Ingredion Inc	6.4B	8.63X	-1%	10.88%	12.06%	#VALUE!	6.48%	1.79X
PPC	Pilgrim's Pride Corporation	5.8B	4.58X	13%	8.32%	9.86%	#VALUE!	11.54%	1.75X
CALM	Cal-Maine Foods Inc	2.8B	4.91X	89%	(44.845%)	27.52%	#VALUE!	8.98%	-0.81X
MGPI	MGP Ingredients Inc	2.6B	16.58X	55%	11.22%	19.24%	#VALUE!	13.77%	0.82X
BRFS	BRF SA (ADR)	1.6B	37.01X	4%	6.39%	9.41%	#VALUE!	2.12%	3.22X
FDP	Fresh Del Monte Produce Inc	1.3B	8.37X	-1%		5.49%	#VALUE!	3.31%	2.51X
ANDE	Andersons Inc	1.2B	6.77X	20%		1.97%	#VALUE!	3.96%	3.24X
AVO	Mission Produce Inc	1.1B	18.53X	-17%	14.9%	9.71%	#VALUE!	9.21%	0.80X
DOLE	Dole PLC	1.0B	6.73X		11.31%	3.22%	#VALUE!	8.06%	1.64X
JBSS	John B. Sanfilippo & Son, Inc.	0.9B		4%		11.32%	#VALUE!	12.96%	0.34X
AGRO	Adecoagro SA	0.8B	4.67X	20%	2.38%	32.09%	#VALUE!	8.31%	1.94X
CVGW	Calavo Growers, Inc.	0.6B	17.05X	-44%	33.89%	2.37%	#VALUE!	(5.365%)	1.24X

Management Commentary

Archer Daniels (ADM) outlook…. "We anticipate ongoing resilient demand for our products, a strong crush margin environment, a positive outlook for starches and sweeteners and a continuation of our growth trajectory in Nutrition. There is also significant uncertainty in the global economy and geopolitical environment. We expect to carry our strong momentum into the first quarter of 2023. We'll advance productivity initiatives to improve operations and processes, optimize costs and enhance efficiencies. We'll drive innovation, expanding and creating new growth engines across our entire business portfolio, Ag Services and Oilseeds, Carbohydrate Solutions and Nutrition."

Darling (DAR) on its markets including strong food ingredient growth… "The results were lower grade fats with DGD not ready to accept and these fats had to be discounted to be sold in North America. However, both domestic and export demand for North American and European proteins was exceptional in the third quarter. We continue to see strong export demand for our Brazilian and European fats, as demand for low carbon intensity feedstock for renewable diesel continues to grow. Our continued product mix shift from gelatin to collagen peptides helped drive margin and EBITDA improvements. We are very encouraged about the future growth in our Food Ingredients business. We expect the college and peptides market to double in the next 5 years. We have additional collagen and capacity coming online in early 2023. We saw strong volumes this summer from our European brand Rendac, which collects fall in animal stock and convert it into green energy. In our waste -- food waste to energy business, expansion plans at our newest Green Energy facility optibet are now underway."

OptionsHawk Executive Summary & Focus Stocks

ADM and BG are quality companies coming off a major surge in growth and peak-cycle concerns while being low-margin businesses make them a tough own at these levels. **Darling (DAR)** at 8.4X EBITDA is a preferred name due to its exposure to renewable diesel and operating with higher margins/ROIC than peers though still a modest EBITDA growth outlook after 2023. **MGP Ingredients (MGPI)** remains a favorite small cap growth name that has a lot of idiosyncratic tailwinds. **Ingredion (INGR)** is the other quality name in this group with stronger margins/growth relative to peers and trading 8.6X EBITDA. Otherwise, we have a group with low margins, low FCF and limited growth potential.

Consumer Based – Paper & Packaging

Resources: Packaging Gateway, Packaging Portal, Paper Age, RISI, Packaging Digest,

Components: AMCR, BALL, AVY, IP, PKG, WRK, CCK, GPK, SEE, ATR, SON, BERY, SLGN, GEF, OI, SLVM, PTVE, MERC, MYE, TRS, CLW, UFPT, TG, KRT, PACK

International & Private Peers: Mondi, Smurfit Kappa, Stora Enso, DS Smith, Coveris, Tetra Laval, Oji Holding, CCL Industries

Intro

The paper & packaging group saw bifurcated performance in 2022 with many of the larger cap names down 20% or more but some of the plays in more resilient end-markets and niche markets with strong years like SLVM and UFPI. The secular aluminum can growth story is intact despite a bump 2022. At current levels beverage can producers are trading near their historical peak discount to beverage CPG companies and have given up nearly all of their recent incremental premium to the rest of the Packaging peer group.

With sector revenues largely exposed to the consumer, healthy spending post-COVID and increased sustainability focus have proven tailwinds to top line growth. Despite significant cost inflation across key raw materials and other inputs, contractual pass throughs and strong pricing power has led to a more muted inflation impact on margins.

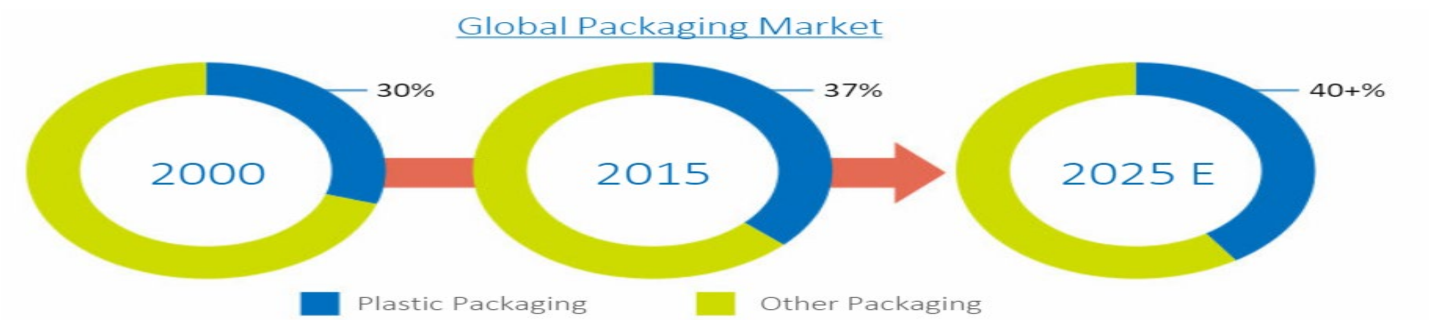
Industry Analysis

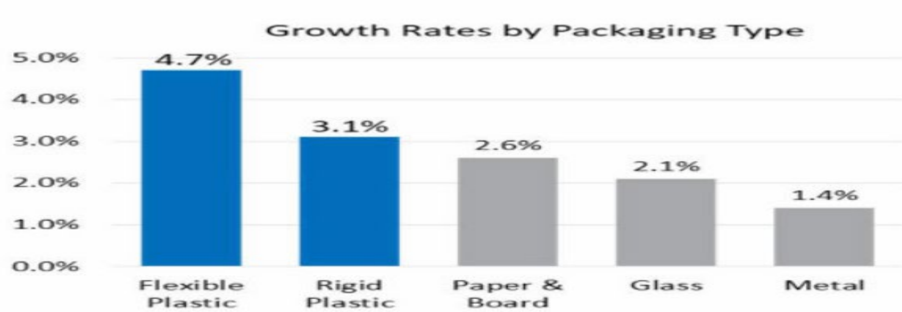
The packaging sector comprises a variety of substrates and end markets principally focused on food, beverage, and household and personal care applications through a variety of aluminum, plastic, and paperboard applications.

The estimated size of the US packaging market is $900B, with plastic packaging accounts for 35% (~$324B) of the market and growing at a 5.0% CAGR (2016-19), faster than other substrates: glass (+3.5%), paperboard (+3.7%), metal cans (+2.1%). Food and beverage segments are the largest end markets for consumer packaging and are relatively stable. Demand growth in the packaging industry is largely driven by GDP growth for consumer related end markets (food/beverage, personal care, healthcare, etc.) and broader industrial production level for non-consumer/industrial end markets (stretch films, tapes, etc.).

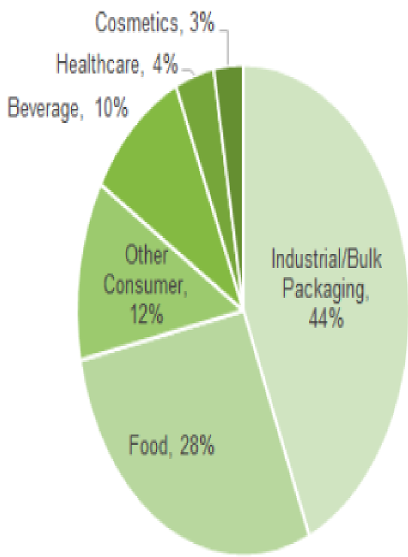
Despite rising macro-uncertainties, the Packaging sector is defensively positioned, with nearly 40% of the packaging sector related to food and beverage markets. Importantly, packaging manufacturers have a high degree of pricing power, given a) the role packaging plays in the delivery of the end product and b) the relatively low input cost relative to the all-in price paid by the consumer for the good. For the most volatile raw materials costs (aluminum for bevcan, resin for plastics), producers have negotiated in automatic pricing mechanisms to ensure these costs are passed through.

Following years of flat growth, the aluminum beverage can substrate has seen annual volume growth accelerate to nearly double-digits (%) since 2018. Behind this growth are multiple (and in our view, sustainable) factors, including sustainability/recycling, consumption habits, and work-from-home trends. The rate of demand growth has significantly exceeded supply, supporting pricing/margin gains for the major suppliers.

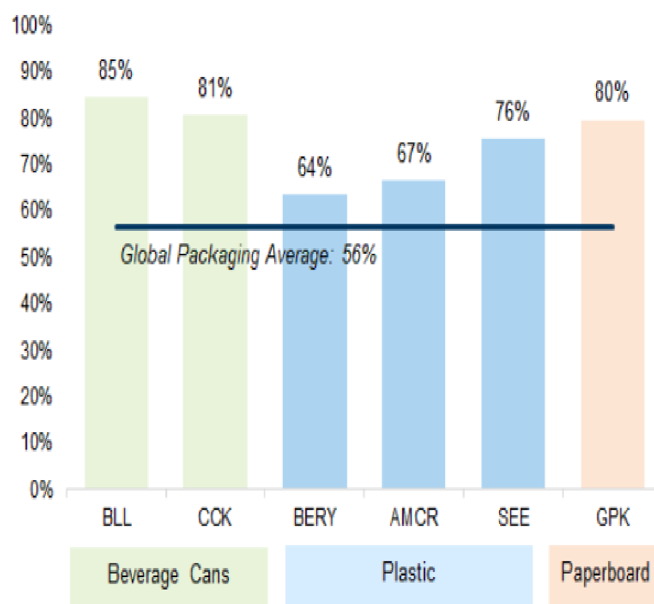




Global Packaging Consumption by end-market use ($bn)



% of sales exposed to consumer goods



Industry Backdrop & Investment Considerations

Back testing performance across the group leads to the conclusion that companies that can expand profit margins faster than revenue growth have done the best, so clearly an industry to focus on margin/efficiency leaders. When assessing the packaging market you can look both at the type of packaging used and the end-markets to determine areas of better growth and stronger trends.

Average monthly returns for the Packaging sector have outperformed the market in normal inflationary periods with rising inflation, while Consumer Staples underperformed. The bulk of outperformance for the sector came late in the business cycle and through recessions due to the group's defensive nature.

Economic growth, industrial production and consumer spending form the foundation for growth in packaging demand. However, there are several factors driving demand such as retail developments and globalization, e-commerce, life-style changes, demography, environmental and sustainability considerations. India and Africa are potential strong future growth market opportunities.

The beverage can industry is bringing a large amount of capacity online in the next three years. Underpinning the growth in BevCans have been significant category shifts into hard seltzer and energy drinks.

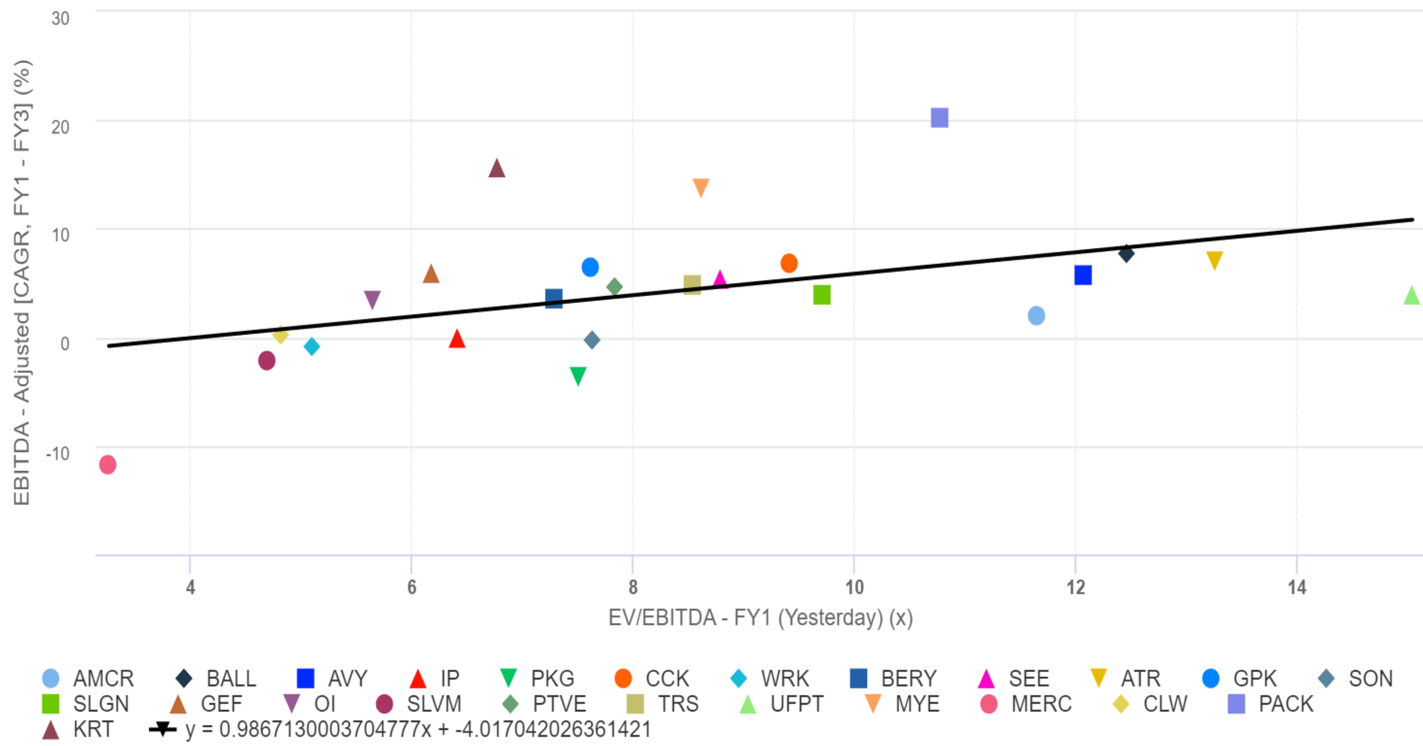
Sustainability trends are favorable primarily for metal (aluminum) beverage can producers BLL and CCK, and secondarily favorable for fiber packaging producer GPK. Greater consumer awareness of the lifetime environmental cost of packaging is more negative for plastic packaging producer AMCR and BERY, while SEE is more insulated given its larger focus on fresh items (notably protein) where extending shelf life and freshness are key attributes that will prove difficult to substitute.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, Revenue Growth, EBITDA Margins, and Cash Flows are all important metrics to observe in this group. EBITDA-Capex spread has been found to be a useful measure of performance of packaging companies. Working Capital Metrics like days sales outstanding, says inventory outstanding, and says payable outstanding are also useful to assess management.

Valuation & Comps

EV/EBITDA to Forward EBITDA CAGR



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/EBITDA
Paper & Packaging							#VALUE!		
AMCR	Amcor PLC	18.4B	11.65X	5%	1.98%	13.31%	5.56%	5.1%	2.63X
BALL	Ball Corp	16.8B	12.47X	11%	15.39%	13.92%	-5.29%	9.08%	2.98X
AVY	Avery Dennison Corp	14.4B	12.07X	14%	7.39%	15.55%	4.58%	13.36%	1.84X
IP	International Paper Co	12.8B	6.41X	-9%	12.89%	13.16%	7.15%	(1.168%)	1.04X
PKG	Packaging Corp Of America	12.5B	7.51X	7%	5.19%	22.44%	5.59%	10.04%	0.93X
CCK	Crown Holdings, Inc.	9.6B	9.41X	3%	16.24%	13.84%	1.50%	11.26%	3.55X
WRK	Westrock Co	9.1B	5.10X	11%	(0.856%)	17.02%	12.12%	5.11%	2.23X
BERY	Berry Global Group Inc	7.4B	7.28X	-1%	3.56%	15.76%	12.14%	8.7%	3.86X
SEE	Sealed Air Corp	7.3B	8.80X	8%	9.89%	20.89%	6.56%	12.06%	2.81X
ATR	AptarGroup, Inc.	7.1B	13.26X	1%	12.54%	18.37%	2.36%	5.89%	1.60X
GPK	Graphic Packaging Holding Co	6.8B	7.62X	1%	3.11%	17.99%	10.49%	4.05%	4.30X
SON	Sonoco Products Co	5.9B	7.64X	-1%	(4.442%)	16.41%	5.11%	5.9%	1.71X
SLGN	Silgan Holdings Inc.	5.8B	9.71X	16%	3.51%	14.12%	5.89%	7.15%	3.54X
GEF	Greif, Inc.	3.3B	6.18X	20%	5.83%	14.62%	8.49%		2.11X
OI	O-I Glass Inc	2.5B	5.64X	-4%	1.96%	15.53%	10.92%	6.0%	3.90X
SLVM	Sylvamo Corp	2.5B	4.70X	-9%	(9.717%)	22.31%	#VALUE!	17.33%	0.97X
PTVE	Pactiv Evergreen Inc	2.1B	7.84X	-14%	6.64%	15.18%	2.28%	(0.818%)	7.13X
TRS	TriMas Corp	1.1B	8.55X	9%		15.71%	#VALUE!	10.94%	1.58X
UFPT	UFP Technologies, Inc.	0.9B	15.04X	-7%	11.09%	18.16%	#VALUE!	7.72%	0.68X
MYE	Myers Industries, Inc.	0.8B	8.61X	5%	9.8%	11.91%	3.45%	5.85%	0.92X
MERC	Mercer International Inc.	0.8B	3.26X	51%	(7.115%)	26.44%	23.97%	10.17%	1.81X
CLW	Clearwater Paper Corp	0.7B	4.82X	2%	5.23%	14.35%	21.10%	1.48%	3.71X
PACK	Ranpak Holdings Corp	0.4B	10.77X	-19%	48.97%	21.34%	-0.54%	(0.304%)	14.15X
TG	Tredegar Corporation	0.4B		-5%		5.15%	#VALUE!	21.12%	0.87X
KRT	Karat Packaging Inc	0.3B	6.78X		16.82%	10.68%	#VALUE!	20.43%	1.73X

Management Commentary

Ball (BALL) on continued growth…. “Today, our global beverage can business is still, as Dan mentioned, in a long-term multiyear growth pattern based on the sustainability tailwinds that we see. The physical attributes of aluminum are unchanged, and they will remain unchanged. Year-to-date, we're growing 2.5% volume year-on-year. That's certainly slowed from the prior 2 years during the COVID disruption, but we're still growing off a much higher base. And we've had some regional differences that we're happy to answer for you as we do the Q&A panel, various reasons, economic impacts or geopolitical, you name it. But we're managing through those. And the fact of the matter is the can is winning. When we look at IRI data, when you look at Nielsen data, when you look at Scan data, the can is winning on a substrate basis versus other packaging substrates in every one of our geographies.”

Amcor (AMCR) on its priorities… “For several periods, we've highlighted multiple commercially oriented drivers that have enabled us to deliver solid and sustainable organic earnings growth over the last 3 years. Our focus on priority segments, including protein, health care, premium coffee, pet food and hot-fill beverages, will continue to be a driver of growth and mix benefits. With more than $4 billion in collective annual sales, we have leading positions in each of these large addressable markets that have been growing at higher than market rates for us historically. And over time, we expect they'll continue to grow at mid-single-digit rates with higher-than-average margins. Emerging markets also continue to be a focus for Amcor. We have a large-scale diversified emerging markets portfolio, which generates annual sales of more than $3 billion. And this is another source of organic growth. And over the long term, we expect these markets collectively will continue to grow at mid-single-digit rates. In the last quarter, several emerging market countries delivered double-digit earnings growth, including India, Brazil and Mexico.”

Avery Dennison (AVY) on Intelligent Labels… “As we've seen a bigger and bigger shift to omnichannel retailing that requires even more accurate inventory to be able to serve that well, whether it's buy online and picking up in the store knowing the item you bought online is going to actually be at the store. So that requires a lot of inventory accuracy that didn't exist prior to RFID. That's helped shift accuracy in those inventories to closer to the high 90s percent from the 60s before. So that's been a significant shift. In addition to just giving more revenue, it's helped bring more automation to their operations where they have less need for as much labor. They don't have as much time taking inventories throughout their stores. So that's brought some automation there as well and also help them reduce waste. So obviously, large logistics players are talking about RFID and how that can benefit them really from an automation perspective, as I talked about a minute ago. And then in food, we're seeing opportunities, as I said, in grocery as well as quick service, fast food type of restaurants and around not just freshness, as I mentioned, but also how do you get more traceability, to be able to trace your food back to the farm from the restaurant. So those are all initiatives that we've got a number of pilots in play with both grocery channels and quick service restaurant channels.”

OptionsHawk Executive Summary & Focus Stocks

Among the large cap names in this group the preferred beverage can play is **Crown (CCK)** which trades at a sizable discount to BALL despite a stronger growth outlook, higher ROIC and comparable margins. **Packaging Corp (PKG)** screens as the bet value at 7.5X EBITDA with solid metrics and steady growth as well as the cleanest balance sheet. **Sealed Air (SEE)** screens well among the mid-caps with consistent growth, high margins, strong FCF and a high ROIC while its exposure to fresh meat protects it from secular declines in plastic. **Karat (KRT)** stands out as a small cap at 6.8X EBITDA despite a very healthy growth outlook and strong ROIC, though weaker than peer margins the concern.

Metals – Diversified – Iron Ore, Nickel, Copper, Uranium

Resources: Mining Metal News, Northern Miner,

Components: BHP, RIO, VALE, FCX, SCCO, CCJ, CLF, TRQ, NXE, UEC, UUUU, DNN, IE, NEXA

International & Private Peers: Norsk Hydro, Anglo American, Glencore, Boliden, Lundin Mining, Antofagasta, Mineral Resources, Jiangxi Copper, Hindustan Zinc, Fresnillo, Newcrest

Intro

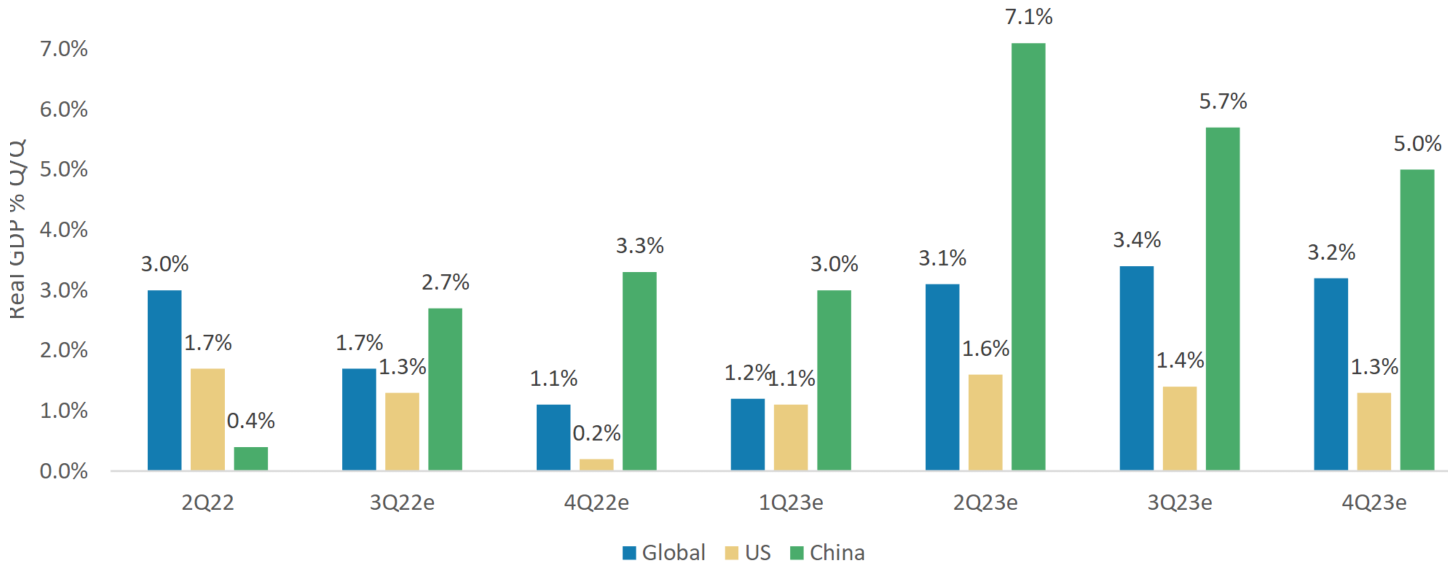
The leaders BHP, RIO and VALE all with strong years in 2022 while TRQ being acquired by RIO caused a big gain. Metals are likely beneficiaries in 2023 from China reopening. Metals & Mining stocks' relative valuation stands at approximately 1 standard deviation below their historical average. With sequentially improving Chinese steel production – from a decent Spring construction season/backlog in infrastructure projects – and seasonally softer supply, Iron Ore should be a tight 1H23 market. The global nickel market remains in surplus in the medium term. Copper seen in surplus in 2023 with the price troughing in mid-2023 as supply growth outpaces demand growth, driven by new mines and improving smelter utilization with stronger TCs and physical premiums. The medium-term story remains strong, driven by electrification demand and a lack of new mining projects.

Macro uncertainties persist with global growth still decelerating, driven by DM and EM ex-China but could see tailwinds in 2023 from policy support and alleviating Covid overhangs. Most commodities (except thermal coal and lithium) are pricing-in a considerable demand slowdown, but the apparent weakening in actual demand is not yet visible in inventories. Companies have displayed capital allocation discipline during the recent commodity rally, resulting in healthy balance sheets.

Industry Analysis

The size of the global market for refined copper is over $200B and expected to reach $310B by the end of 2026, a CAGR of 5.1%. Prices are closely tied to activity in China, which accounts for roughly half of global copper consumption. The worldwide market for Iron Ore is expected to grow at a CAGR of roughly 8.8% over the next five years, will reach $252B USD in 2024. The nickel market was valued at around 2.3 million tons in 2020, and the market is projected to register a CAGR of more than 5% for 20-21-2026.

GDP growth forecasts are shown below:



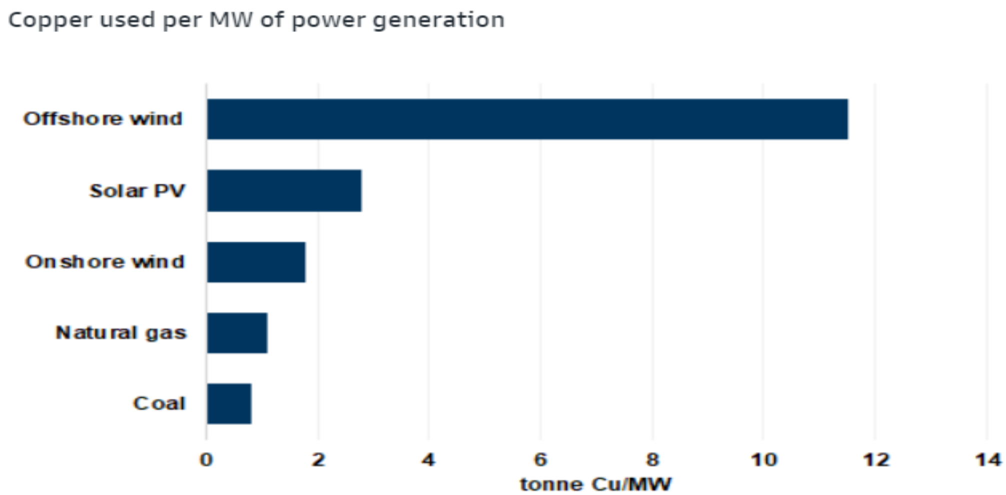
Industry Backdrop & Investment Considerations

Commodity Prices, Global Economic Growth, Supply/Demand

Some key characteristics of materials for future megatrends include lightweight, corrosion resistance, conductivity, purity, thermal management, lubricity, reliability, durability, miniaturization, and strength. A few of these megatrends include electronic miniaturization, additional aero/auto instruments, high performance optical devices, innovation in medical sensors and diagnostics, oil & gas extraction from previously inaccessible locations, alternative energy, and LED.

As energy transition becomes increasingly top-of-mind, copper is the commodity with the most attractive demand outlook. The metal is used in a wide range of applications that underpin the decarbonization theme - electric vehicles uptake and the shift to renewable energy being the two key green alternatives. We believe EVs will drive an incremental 425 kt of demand, while offshore wind growth alone could add almost 200 kt.

Against a "megatrend" of increasing electrification, momentum is building towards non-traditional nuclear, such as small modular reactors and advanced reactors as well as recognition of nuclear energy's role in the production of low-carbon heat for the production of hydrogen and desalination. Increasing demand for nuclear means increasing demand for uranium and utilities have not been replacing what they consume annually under long-term contracts. Estimates show that by 2030 about two-thirds of utility requirements will be uncovered and this will reach 81% in 2035. UxC's base case projects an annual shortfall of almost 100 million pounds at 2035, so the world needs to discover, develop, commission about six McArthur Rivers or Cigar Lakes in the next 15 years.



Indicators, Metrics & Stock Selection Framework

FCF Yield, EV/EBITDA, EBITDA CAGR, Debt to EBITDA, EBITDA Margins (gauge of cost management), Cash Flow Conversion ((Operating Cash Flow – Working Capital) / EBITDA), Capital Intensity (CAPEX/(Operating Cash Flow – Working Capital)

Stock selection within this group can be tricky, though there generally is little dispersion among the names as metal stocks tend to trade day to day with the movement in the underlying commodity as supply/demand dynamics shift. It is a very industrial driven group with close ties to end-markets such as Auto, Aerospace, Construction, and Energy. Aluminum is primarily used in Transports/Packaging, Copper in Construction/Electrical, Iron/Steel in Auto, Construction and Oil/Gas, Nickel in Consumer/Industrial, and Zinc in Construction.

EV/EBITDA is primarily used for large, stable and diversified miners such as BHP Billiton, Rio Tinto, Glencore and Vale. For these companies, mining project life is well defined and cash flows are relatively predictable. If one mine goes under, this will not have an outsized effect on EBITDA because there are several mines across several commodities being extracted concurrently.

P/NAV is more popular for miners that focus on one or two commodities – it ascribes value given to each ounce of gold or whatever the relevant unit metric is for the metal. Where the P/NAV multiple trades at is dependent on how de-risked the mining asset is (when the next stage is reached, the profits become less uncertain). With each stage of development, the P/NAV multiple will trade higher – from feasibility (preliminary economic assessment, pre-feasibility & feasibility) to construction to production to project expansion. Most explorers, developers and junior producers will be evaluated on P/NAV. The P/NAV for explorers can be 0.3-0.5x, so that there is a healthy risk premium embedded. The highest P/NAVs are the royalty companies, perceived by the market to have low operational risk.

Price/Cash Flow is the second most popular metric for most non-global, diversified miners. Usually Price/Cash Flow is looked at from a one year out and two year out basis. P/CF will also heavily consider the country risk for the miner, as assets in developed nations are more likely to see work stoppages due to labor shortages, strikes and other unforeseen production delays.

Other valuation metrics include EV/P1 Reserve, EV/P2 Reserve, and EV/Resource. Other key metrics we will look at are the Quick Ratio for assessing financial health, Operating Margins for profitability/cost management, FCF Yield, Asset Replacement Ratio and ROE for assessing management.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Diversified							#VALUE!		
BHP	BHP Group Ltd (ADR)	162.6B	5.51X	36%	(5.819%)	64.13%	6.76%	(14.879%)	0.06X
RIO	Rio Tinto plc (ADR)	115.7B	4.52X	38%	1.14%	52.38%	#VALUE!	8.92%	-0.01X
VALE	Vale SA (ADR)	81.2B	23.09X	86%	6.67%	38.12%	1.95%	33.8%	0.04X
FCX	Freeport-McMoRan Inc	55.2B	7.39X	117%	20.38%	29.26%	2.47%	25.87%	0.34X
SCCO	Southern Copper Corp	46.9B	10.00X	40%	11.82%	45.4%	#VALUE!	7.93%	0.51X
CCJ	Cameco Corp (USA)	9.4B		-54%	61.42%	20.14%	#VALUE!	(2.694%)	-1.80X
CLF	Cleveland-Cliffs Inc	8.0B	3.99X	217%	20.16%	8.0%	19.48%	30.87%	1.05X
TRQ	Turquoise Hill Resources Ltd	6.3B			214.29%	25.34%	#VALUE!	3.99%	2.82X
NXE	NexGen Energy Ltd	3.9B	-140.41X	45%	46.06%		-1.08%	(42.676%)	-0.21X
UEC	Uranium Energy Corp.	1.2B	-90.00X	23%		(11.367%)	-0.60%	2.55%	1.56X
IE	Ivanhoe Electric Inc	1.0B	-12.19X	57%	(11.687%)	(3394.412%)	-11.17%		-0.23X
UUUU	Energy Fuels Inc	0.9B	-66.97X	13%	833.66%	(436.891%)	#VALUE!	(20.739%)	2.10X
NEXA	Nexa Resources SA	0.7B	2.95X	37%	(1.835%)	15.85%	-24.73%	3.42%	1.29X

Management Commentary

Freeport (FCX) on Copper markets…. "Global copper inventories remain at historical levels. You see production reports from producers across the globe reporting challenges in meeting their production targets and the industry is facing increasingly challenges in developing new supplies. In the current environment, stretch supply chains, production shortfalls are becoming commonplace and cost curves are rising. The positive thing is that new sources of copper demand are emerging now and there is widespread recognition that copper demand will be significantly benefited by the ongoing global electrification around the world, investments to reduce carbon, they're beginning to accelerate, and this is going to occur more rapidly in the future and it's going to be a big impact on copper demand. To meet that demand, the energy transition will require a massive amount of copper and other steps to deal with it. Higher prices will be required to bring on new supplies, much higher prices than we have now, simply because the current price is not sufficient to incent new supply development on the scale that will be required to meet this increasing demand."

Cameco (CCJ) on Uranium markets…. "But supply is a different picture. Low prices have led to growing supply concentration by origin and a growing primary supply gap. Along the way, the secondary supplies that have played such a crucial role in our industry have been drawn out of the market. And taking the challenge of filling that gap to a whole new level is a desire to diversify away from Russian supply in nuclear fuel supply chains. Currently, the global nuclear industry relies on Russia for approximately 14% of its supply of uranium concentrates, 27% of conversion supply and 39% of enrichment capacity. Utilities are now considering and planning for a variety of potential scenarios ranging from an abrupt end to Russian supply to a gradual phase out. It's still early days, but we are already seeing some utilities beginning to pivot toward procurement strategies that more carefully weigh the origin risk. And we believe we are well positioned to help our customers derisk their fuel supply needs, and this has us very optimistic. We're optimistic about the growth in demand for nuclear power, both traditional and non-traditional. We're optimistic about the growth in demand for uranium and for the downstream fuel services. And we're optimistic about the opportunity for Cameco in capturing long-term value."

OptionsHawk Executive Summary & Focus Stocks

Southern Cooper (SCCO) is a favored large cap in this group due to Copper being a favored space, its growth prospects, strong margins and a strong capital return name with potential to generate 30% of its market cap in

FCF through 2026. None of the small cap screen particularly well in this group but **NexGen (NXE)** a potential grower in the Uranium space if its project gets approved.

Metals – Steel

Resources: AISI, Steel on the Net, Steel Orbis, World Steel,

Components: NUE, MT, TS, STLD, PKX, RS, GGB, TX, CMC, SIM, X, SID, WOR, EAF, RYI, SCHN, ASTL

International & Private Peers: China Baowu Steel, Hesteel, Nippon Steel, Tata Steel

Intro

Steel stocks performed very well in 2022 due to a strong pricing environment. The US and EU are considering new tariffs aimed at Chinese steel and aluminum imports to reduce global overcapacity and to help their climate agenda. Carbon-based tariffs on aluminum and steel could be a potential replacement to Section 232. Nucor management believes there are three major drivers of steel demand in the US in the coming years: 1) The Infrastructure Bill has the potential to add ~3-5mt per year in US steel consumption; Inflation Reduction Act will accelerate the US' transition to clean energy that is more steel intensive relative to traditional energy sources; 3) The CHIPS and Science Act will provide a positive tailwind for both steel and steel products as semi-conductor manufacturing facilities are often steel intensive.

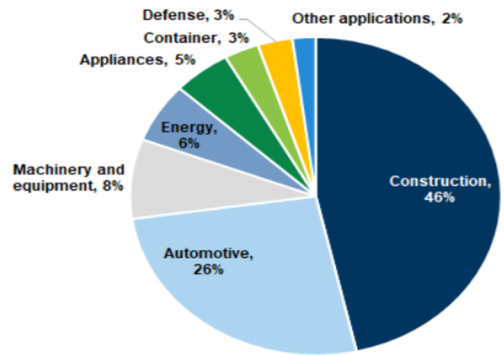
High levels of economic uncertainty have caused order backlogs to decline ~50% from their recent inflated peaks (they remain at historically strong levels) as buyers moved to the sidelines. Weak orders volumes has caused downward pressure on steel pricing, and mills are starting to offer price incentives to stimulate purchases. Industry leaders see the floor for HRC prices will near $700/t as the US steel industry is fundamentally different than in previous cycles due to greater industry consolidation and discipline from the mills.

Industry Analysis

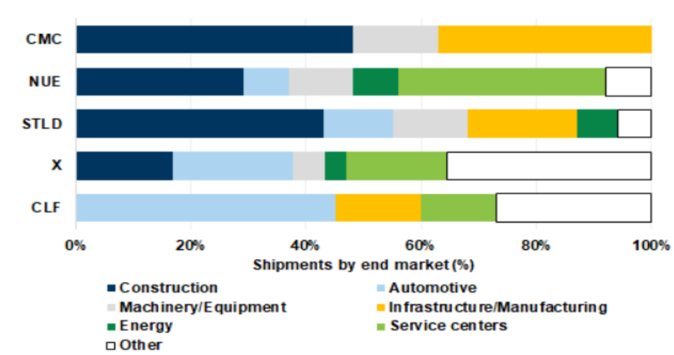
The US steel industry is a highly cyclical sector and is a highly localized market, with a few key producers and economic dynamics underpinning the supply/demand dynamics. A series of corporate transactions has now consolidated about 75% of US steel shipments into the hands of five market participants. Understanding the North American steel sector requires making sense of the localized US supply/demand dynamics, knowing the key end markets to which each company is exposed, and keeping on top of the direction in which profitability margins move to determine the competitive positioning of each company.

A few key Macro indicators worth paying attention to include the ABI (Architecture Billings Index), Housing Starts/Building Permits, Auto Sales, and ISM Manufacturing. Construction & Automotive account for 72% of steel shipments and are the key end-markets.

2020 steel shipments by end markets



FY20 end market exposures



Industry Backdrop & Investment Considerations

The steelmakers have typically traded ahead of company fundamentals, outperforming the market as EBITDA margins inflect and underperforming as margins peak ahead of a reversal in profitability. The greatest returns can be achieved for cyclical sectors through a more contrarian strategy — that the time to buy is when fundamentals are at a cyclical trough and a positive inflection is imminent. On the other hand, the time to sell is during a period of broad-based optimism when fundamentals peak and subsequently begin to reverse.

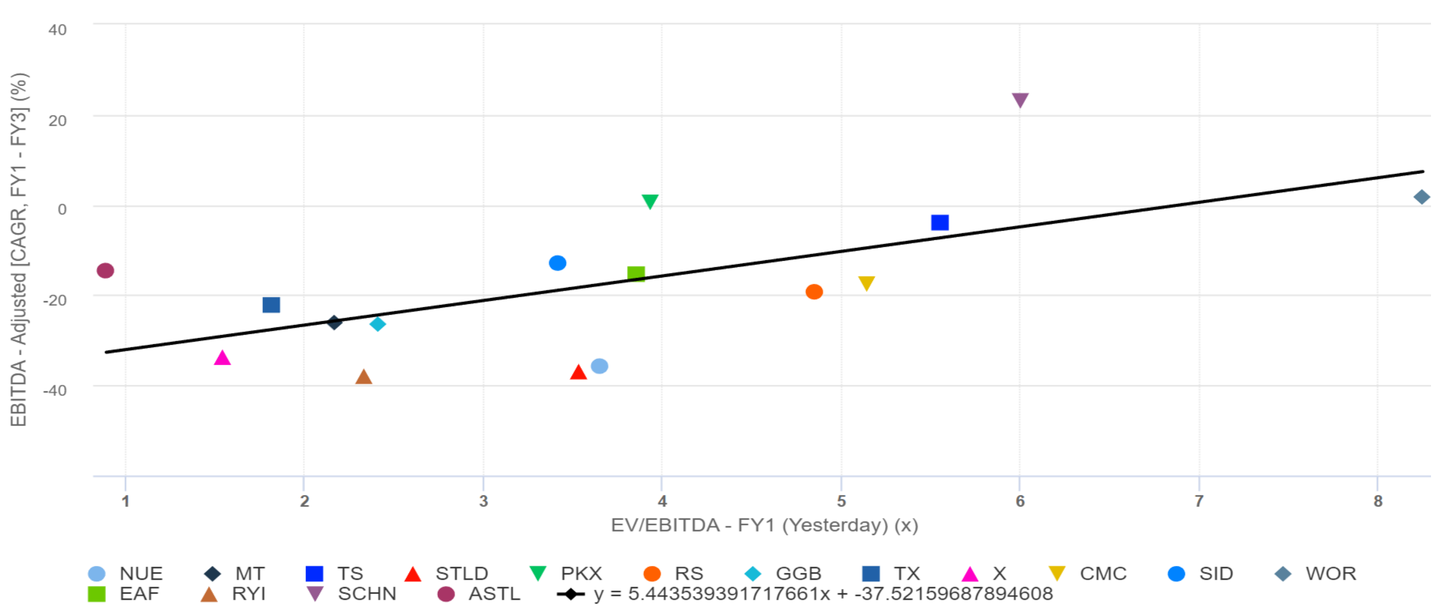
Understanding the North American steel sector requires making sense of the localized US supply/demand dynamics, knowing the key end markets to which each company is exposed, and keeping on top of the direction in which profitability margins move to determine the competitive positioning of each company. The US steel industry caters to a number of key industries, including (most importantly) construction, the automotive sector, machinery, and oil and gas industries, among others.

Indicators, Metrics & Stock Selection Framework

FCF Yield, EV/EBITDA, EBITDA CAGR, Debt to EBITDA, EBITDA Margins (gauge of cost management), Cash Flow Conversion ((Operating Cash Flow – Working Capital) / EBITDA), Capital Intensity (CAPEX/(Operating Cash Flow – Working Capital), Debt to EBITDA, Day Sales Outstanding, Inventory Turnover

Valuation & Comps

EV/EBITDA to EBITDA CAGR



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Steel							#VALUE!		
NUE	Nucor Corporation	37.7B	3.65X	95%	(1.384%)	25.2%	17.97%	41.5%	0.26X
MT	ArcelorMittal SA (ADR)	24.1B	2.17X	93%	4.59%	14.02%	19.75%	30.8%	0.28X
TS	Tenaris SA (ADR)	19.2B	5.56X	0%	(13.461%)	31.79%	8.62%	5.12%	-0.31X
STLD	Steel Dynamics, Inc.	19.0B	3.53X	88%	(11.159%)	25.29%	16.93%	43.37%	0.39X
PKX	Posco Holdings Inc (ADR)	18.3B	3.93X	32%	37.5%	8.53%	#VALUE!	8.99%	0.36X
RS	Reliance Steel & Aluminum C	11.9B	4.86X	33%	5.7%	15.06%	13.14%	18.3%	0.53X
GGB	Gerdau SA (ADR)	9.4B	2.41X	101%	(3.348%)	25.39%	#VALUE!	17.9%	0.43X
TX	Ternium SA (ADR)	6.1B	1.81X	96%	2.78%	16.46%	#VALUE!	31.45%	-0.01X
X	United States Steel Corporati	6.0B	1.54X	180%	5.1%	16.3%	21.07%	44.03%	0.38X
CMC	Commercial Metals Company	5.6B	5.15X	75%	(17.553%)	16.72%	8.20%	26.96%	0.40X
SIM	Grupo Simec SAB de CV (ADR	5.3B		92%	(13.567%)	21.27%	#VALUE!	76.33%	-0.51X
SID	Companhia Siderurgica Nacio	3.9B	3.42X	114%	(0.466%)	24.91%	#VALUE!	26.47%	0.79X
WOR	Worthington Industries, Inc.	2.6B	8.25X	41%	1.76%	9.96%	12.75%	17.82%	0.94X
EAF	GrafTech International Ltd	1.3B	3.86X	-20%	28.66%	42.31%	27.02%	46.78%	1.68X
RYI	Ryerson Holding Corp	1.1B	2.34X	38%	13.19%	6.45%	32.22%	28.5%	1.33X
SCHN	Schnitzer Steel Industries, Inc	0.9B	6.00X	91%	23.14%	4.47%	#VALUE!	14.37%	0.40X
ASTL	Algoma Steel Group Inc	0.6B	0.89X		(14.576%)	13.8%	-3.04%	116.67%	-0.07X

Management Commentary

Nucor (NUE) on demand drivers… "So as we start to think about demand, there's really 3 key drivers or 3 trends that we see happening right now that are very positive for demand. And the first one is infrastructure. And this has got some news recently, we've had some spending bills passed. We're excited about that. We think it's the right thing for America, but it's also a huge tailwind for steel demand. We'll have more spending on infrastructure as a company in the next 10 years than we've had in the last 7 decades. That's a huge win. It's something like 3 million to 5 million tons per year annual steel demand incremental from prior years. As we think in the middle there about the reshoring and the onshoring story in America, this is also great for our country. It's also a tailwind for steel demand. And I'll share some thoughts more about that because some of the things we're seeing within that reshoring story are also particularly steel intensive. And lastly, there's the power grid modernization. As we start to transition from a fossil fuel-based energy system to renewables, that transition is steel-intensive. This is also some exciting things happening here. So as we start to think more about demand and about construction -- this is the Dodge forecast. Dodge are the leading -- what we would consider the leading construction economists in the -- certainly in the country. This is their forecast. It's for 10% annual growth. This is non-building. So this is from 2021, the last full year of data out through 2026. So when we talk about infrastructure spending, you're going to see that impacted here because this is non-buildings."

Reliance Steel (RS) on end-market demand…. "Demand across the broader manufacturing sectors we serve, including industrial machinery, consumer products and heavy equipment experienced expected seasonal declines in the third quarter compared to the second quarter. And that said, our broader manufacturing sector improved compared to the third quarter of 2021 with underlying manufacturing demand remaining at healthy levels. Semiconductor demand remained robust during the third quarter and continues to be one of our strongest end markets. Commercial aerospace demand continued to recover with our shipments improving over the second quarter and also year-over-year for the third consecutive quarter since the onset of the pandemic. As a reminder, roughly half of our exposure to aerospace is commercial. Demand in the military, defense and space portions of our aerospace business remains strong with healthy backlog. Finally, demand in the energy sector experienced normal seasonality compared to the second quarter of 2022."

OptionsHawk Executive Summary & Focus Stocks

Steel has some positive drivers for the industry to stay resilient with a strong pricing environment but also faces peak-cycle concerns. **Steel Dynamics (STLD)** has always been the preferred name in this group and continues to operate flawlessly but looking to 2023, **Nucor (NUE)** has very similar metrics and a bit more resilient earnings in a downturn with management making some interesting moves. None of the smaller Steel names look attractive considering the dominance by STLD/NUE but one intriguing name is **GrafTech (EAF)** with high margins and high ROIC but faces suspended operations that will cause a sizable decline in results in 2023 but a potential play in 2H23 for the 2024 recovery.

Metals – Aluminum, Lithium & Coal

Components: ALB, SQM, TECK, AA, LTHM, MP, SGML, LAC, BTU, CNX, ARLP, AMR, ARCH, CEIX, HCC, CSTM, KALU, PLL, SLI, FEAM, CENX, LGO, NRP

International & Private Peers: Rusal, Hongqiao, Norsk Hydro, Chinalco, South32, AWC, Xinfa, Rio Tinto, EGA, Jiangxi Ganfeng Lithium, Tianqi Lithium, Nemaska Lithium, Sasol, CEZ Group, Coal India, Wesfarmers, NTPC, Anglo American, PTT Pubic, China Shenhua

Intro

Lithium and Coal names turned in big performances in 2022 but now face price peaks and potential for decelerating demand. China's BEV penetration is already >20% and subsidies will be partially phased out, which will slow growth in 2023. Lithium has a 16% demand CAGR out to 2030 and potential for a 20% or greater supply shortfall by 2030.

After falling steadily since Q1 2021, Aluminum exchange inventories have risen modestly but still remain close to levels last seen in the early 1990s. The aluminum price is hovering around the 50th percentile of the cash cost curve, where it has historically found a floor. Russia accounts for 6% of global aluminum production, and exports around 75% of output. The overall demand situation continues to look difficult with sharp declines in European industrial gas use as well as still weak China property.

Industry Backdrop & Investment Considerations

The Metals market all come down to China basically with the supply and demand side implications from policy and Macro. Electrification and Consumer Packaging remain key end-market growth drivers for Aluminum. Whilst copper and nickel have generally received most focus as beneficiaries of green electrification, aluminum is a critical raw material in both the solar and EV sector. The world's largest aluminum producers are fully aware of the decarbonization challenge amidst the surge in green aluminum demand, and the race to cut emissions and produce greener aluminum is well underway.

The recent Lithium price peak had a clear implicit message: demand is strong and inventories are tight. The quantification of inventories is a key debate today, since the battery value chain has been building up capacity (and batteries inventories) moving the focus to global auto demand, where a potential EV slow down could result in a card´s effect in the lithium value chain. With auto manufacturers short on supply ahead of milestone EV launches, market prices for lithium now reflect scarcity value and not what is grounded by marginal producer economics. Chinese spot lithium prices have been holding in at near a peak (~$70,000/ metric ton (mt) for carbonate) since they rallied to those levels in February. Prices could even move higher through year-end, as Chinese brine production scales back seasonally in the winter. Current prices support almost infinite lithium expansion, as payback periods are now measured in months and not years.

Indicators, Metrics & Stock Selection Framework

FCF Yield, EV/EBITDA, EBITDA CAGR, Debt to EBITDA, EBITDA Margins (gauge of cost management), Cash Flow Conversion ((Operating Cash Flow – Working Capital) / EBITDA), Capital Intensity (CAPEX/ (Operating Cash Flow – Working Capital), Debt to EBITDA

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Aluminum, Lithium, Coal									
ALB	Albemarle Corporation	29.7B	9.38X	-8%	(1.91%)	56.89%	0.68%	3.92%	2.68X
SQM	Sociedad Quimica y Minera d	26.1B	4.30X	36%		55.95%	7.23%	1.6%	0.54X
TECK	Teck Resources Ltd (USA)	18.9B	3.51X	33%	(1.119%)	40.72%	12.06%	10.11%	1.14X
AA	Alcoa Corp	8.0B	4.22X	29%	33.22%	7.37%	6.64%	30.62%	0.14X
MP	Mp Materials Corp	5.5B	12.92X	400%	28.47%	73.42%	6.48%	36.35%	-2.14X
LTHM	Livent Corp	4.3B	11.88X	-17%	10.14%	47.84%	0.08%	3.93%	2.54X
BTU	Peabody Energy Corporation	4.0B	1.98X	3%	(3.264%)	32.69%	24.55%	16.48%	0.57X
SGML	Sigma Lithium Corp	3.6B		159%	(21.175%)		#VALUE!		2.53X
LAC	Lithium Americas Corp	3.1B	-32.87X	62%	(18.144%)		-1.65%	(13.417%)	2.69X
CNX	CNX Resources Corp	2.9B	3.83X	11%	(13.193%)	28.04%	#VALUE!	5.46%	1.97X
ARLP	Alliance Resource Partners, L.	2.7B	3.12X	-11%	10.57%	39.81%	#VALUE!	8.46%	0.89X
ARCH	Arch Resources Inc	2.6B	1.76X	21%	(13.558%)	25.82%	36.19%	45.97%	0.43X
AMR	Alpha Metallurgical Resource	2.5B	1.11X	34%	(14.325%)	33.9%	52.42%	35.91%	0.76X
CEIX	Consol Energy Inc	2.4B	3.33X	1%	(19.601%)	33.86%	19.96%	6.07%	1.57X
HCC	Warrior Met Coal Inc	1.8B	1.35X	-2%	17.48%	43.98%	36.92%	24.14%	0.20X
CSTM	Constellium SE	1.7B	5.37X	2%	11.62%	7.91%	10.79%	12.56%	3.39X
KALU	Kaiser Aluminum Corp.	1.3B	12.69X	-5%	48.02%	4.19%	#VALUE!	(0.728%)	2.10X
CENX	Century Aluminum Co	0.7B	9.03X		155.81%	(5.634%)	-3.35%	(7.724%)	1.88X
SLI	Standard Lithium Ltd	0.6B		270%			#VALUE!	(83.362%)	3.15X
NRP	Natural Resource Partners LP	0.5B		68%		89.22%	#VALUE!	17.16%	1.91X
FEAM	5E Advanced Materials Inc	0.4B					#VALUE!		
LGO	Largo Inc	0.3B	3.84X	83%	23.04%	3.77%	0.54%	14.24%	-1.04X
PLL	Piedmont Lithium Ltd	0.3B	-8.15X	30%	(72.023%)		#VALUE!	(37.702%)	1.68X

Management Commentary

Albemarle (ALB) on lithium markets…. "We expect all 3 GBUs to grow in 2023 even in the turbulent market environment. But it's going to look different for each of our businesses. For example, in Lithium and Bromine, our vertical integration and access to low-cost resources helps control our cost structure. While approximately 45% of our costs come from raw materials and services, 20% of those relate to our own spodumene. We continue to expect strong demand for lithium driven by the secular shift to electric vehicles, including OEM investments and public policy support. Of the three businesses, Bromine and our Lithium Specialties demand is likely the most leveraged to global economic trends in consumer and industrial spending, automotive and building and construction. At the same time, they benefit from having diverse end markets, meaning they can allocate production to higher growth or higher margin end markets as needed. Bromine and Lithium Specialties also tend to rebound quickly after a recession. Catalysts demand is closely linked to transportation fuel demand. In a typical recession, Catalysts is relatively resilient. Think about it this way. Oil prices generally drop in a recession and that drives higher fuel demand, which equals higher catalyst demand for refining. And typically, the Catalysts business would benefit from lower raw material costs in a recessionary environment."

Teck (TECK) on diversifying from coal…. "The heart of our strategy is copper growth. We remain focused on generating value from our industry-leading copper growth profile. QB2 will double our consolidated copper production when it reaches full production next year. And together with the remainder of our portfolio of attractive growth options has the potential to add 5x the amount of our current copper equivalent production. Secondly, we are rebalancing our portfolio of high-quality assets towards low-carbon metals, in particular, copper, where demand is expected to double by 2050, driven in large part by electrification and the low carbon transition. We intend to capitalize on this market opportunity while at the same time, reducing the proportion of carbon in our overall portfolio."

Alcoa (AA) on aluminum markets…. "I'd like to start my comments by focusing on the long-term fundamentals of our markets. While the world is currently in a period of heightened uncertainty, the outlook for our industry remains very positive. And this view isn't merely supported by the fact that year-over-year demand is consistently increasing. That's been the case for more than a decade. Rather, I'd like to highlight the structural changes driven by evolving energy markets on both the demand and supply sides of our industry. Both the source and cost of energy supplies help determine whether a facility can compete economically. Renewable energy provides a further differentiation through lower carbon emissions. Still, decarbonization is not just a facet of energy sourcing and, therefore, aluminum production, but it is also embedded in the choices of our customers and, ultimately, for their final consumers. Another important end-use market for aluminum is packaging. Demand in that sector is expected to increase steadily and consistently. Aluminum is a sustainable choice for packaging due to its recyclability, its low weight and the format that makes it easier to ship, all of which helps reduce emissions. Next, both the generation and transmission of solar and wind power will require more aluminum than other forms of energy, such as thermal, hydro or nuclear. Solar generation, for example, requires approximately 13 metric tons of aluminum per megawatt of generating capacity compared to coal that only requires about 1 metric ton."

OptionsHawk Executive Summary & Focus Stocks

Albemarle (ALB) is a high-quality name and long-term large opening put sales point to it continuing to be a strong performer though the potential pricing headwinds make it a tough name to trust for 2023 while peer **Sociedad Minera (SQM)** has stronger FCF and similar margins but also faces declining prices/volumes. **Teck Resources (TECK)** screens well across all metrics and is a favorite with its focus on a new Copper project for growth. **MP Materials (MP)** is an attractive small cap with strong FCF, high ROIC and industry-best margins. MP Materials is constructing a rare earth metal, alloy, and NdFeB magnet manufacturing facility in Fort Worth, Texas, with a gradual production ramp expected to start in 2023. **Kaiser (KALU)** is another small cap I like coming off a blowout quarter as the Aerospace recovery fuels a revision cycle. **Warrior Met Coal (HCC)** is another small cap that screens healthy on margins and EBITDA margins.

Metals – Specialty Metals

Components: HWM, TKR, ATI, ESAB, ARNC, KMT, CRS, MTRN, GSM, PRLB, AZZ, HAYN, IIIN

International & Private Peers: SKF Group, Schaeffler Group, NTN Corp, JTEKT Corp, NSK, Precision Castparts, Aubert & Duval, VDM Metals (Acerinox SA), Aperam, VSMPO, Lisi Aero, Weber Metals, Doncasters, Wieland Chase, IBC Advanced Alloys

Intro

Specialty Metals was a group for stock picking in 2022 with ATI, CRS, HWM, and HAYN strong due to Aerospace end-market exposure while other names were hit hard by supply chain issues.

Industry Backdrop & Investment Considerations

This is a group is made up of mostly small cap niche plays in specialty metals and the industry is similar to the other metals ones discussed while end markets tend to be less diversified and very focused.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Growth, Debt to EBITDA, EBITDA Margins, ROIC, FCF Yield

Valuation & Comps

EV/EBITDA to EBITDA Margins

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Specialty Metals							#VALUE!		
HWM	Howmet Aerospace Inc	15.7B	15.31X	-30%	11.36%	22.54%	3.51%	6.07%	3.07X
TKR	Timken Co	5.1B	7.98X	-1%	1.86%	18.8%	4.77%	8.05%	1.64X
ATI	ATI Inc	3.8B	9.75X	-25%	10.64%	13.67%	1.46%	0.79%	3.57X
ESAB	ESAB Corp	2.8B	9.59X	5%	6.03%	15.4%	6.76%	11.17%	-0.10X
ARNC	Arconic Corp (PITTSBURGH)	2.2B	5.21X	9%	25.33%	6.27%	7.14%	(14.044%)	1.23X
KMT	Kennametal Inc.	2.0B	7.90X	17%	7.3%	15.76%	9.94%	4.68%	1.37X
CRS	Carpenter Technology Corpoı	1.9B	9.38X	-41%	29.05%	7.76%	0.38%	(4.941%)	4.85X
MTRN	Materion Corp	1.7B	11.36X	6%	(33.228%)	11.4%	1.91%	7.4%	1.77X
AZZ	AZZ Inc	1.0B	7.68X	0%	2.56%	20.38%	10.76%	8.08%	1.19X
GSM	Ferroglobe PLC	0.7B	1.11X		9.1%	31.24%	89.85%	(5.181%)	2.23X
PRLB	Proto Labs Inc	0.7B	6.74X	-14%	60.72%	18.04%	9.29%	6.67%	-1.72X
HAYN	Haynes International, Inc.	0.6B	7.28X	92%	8.2%	16.35%	5.87%	9.04%	0.23X
IIIN	Insteel Industries Inc	0.6B	4.58X	113%	3.02%	16.82%	18.24%	30.64%	-0.39X

Management Commentary

Howmet Aero (HWM) on Commercial Aerospace markets…. “In September, we saw commercial aerospace customers rebase their schedules, notably in Engine Products reflecting 2 dynamics: firstly, a lower narrow-body engine build over the summer and early fall than was originally envisaged and due partially to the availability of structural castings. And secondly, customers bringing airfoil inventory levels in line by year-end. Momentum does continue into 2023 with commercial aerospace expected to perform above normal growth rates in 2023, 2024 and also 2025 before reverting to a more normal 4% per year growth for Aerospace. So I think the big picture is commercial aerospace continues to grind higher. Everybody is trying to do the right things. And airlines are improving. I think aerospace manufacturers are improving their through-puts and the engine manufacturer supporting those aircraft builds are also doing their part of the whole thing. I guess not everything is going perfectly, as we've seen from some of the numbers and some of the disconnects apparent from commentary on calls last week.”

Timken (TKR) on its shifting portfolio mix… “We have steadily shifted the end market mix of the company by investing in our own capabilities and also through M&A. As a result, our market mix is one of the most attractive in the industry. And a good portion of our sales today are in newer markets like renewable energy and automation, which are experiencing strong secular growth. Renewable energy is now our single largest individual end market at 12% of sales, and automation is right behind it at 8% of sales. We continue to maintain our leadership in our traditional core end markets, markets like aerospace, rail and construction, which are also critical to our global growth. At the same time, we're focused on winning across sectors newer to Timken that include marine, robotics, food and beverage and others. Strategically, we're shifting our end market mix to attractive markets with strong margins, secular growth and different cyclicality profiles. Some of these markets include renewable energy, automation, services, marine, food and beverage and passenger rail. Automation is also an attractive market for Timken. We've built a diverse portfolio of products for high-growth automation end markets, including robotics, logistics, conveyance. We also provide automatic lubrication systems that serve a variety of end markets, and our Groeneveld, BEKA business is among the world's largest producers of automatic lubrication systems. Another market opportunity that we're working to scale is food and beverage. We like food and beverage for its challenging applications. We continue to contribute significantly to the world shift to renewable energy production. We are proud to be a leading supplier to some of the most significant wind and solar projects worldwide.”

OptionsHawk Executive Summary & Focus Stocks

Howmet Aero (HWM) is the lone large cap in this group and has a solid set-up into 2023 with Aerospace continuing to recover, though feels fully valued at 13X EBITDA. In the $2B to $5B market cap tier, **Kennametal (KMT)** screens most attractive delivering steady growth and strong margins. KMT plant modernizations should lead to higher margins as demand recovers. **Carpenter Resources (CRS)** in a favored small cap as it is forecasting substantial EBITDA growth the next two years and although currently a low-margin name if it can get back to 15% margins from 2019 it can also re-rate higher.

Metals – Precious Metals

Components: NEM, FNV, GOLD, AEM, WPM, GFI, SBSW, RGLD, AU, KGC, AGI, AUY, BTG, PAAS, SSRM, OR, HL, AG, HMY, NG, BVN, HBM, MAG, EGO, EQX, SAND, CDE, IAG

International & Private Peers: Industrias Penoles, Polymetal, Fresnillo, Polyus, First Quantum, Newcrest Mining, Shandong

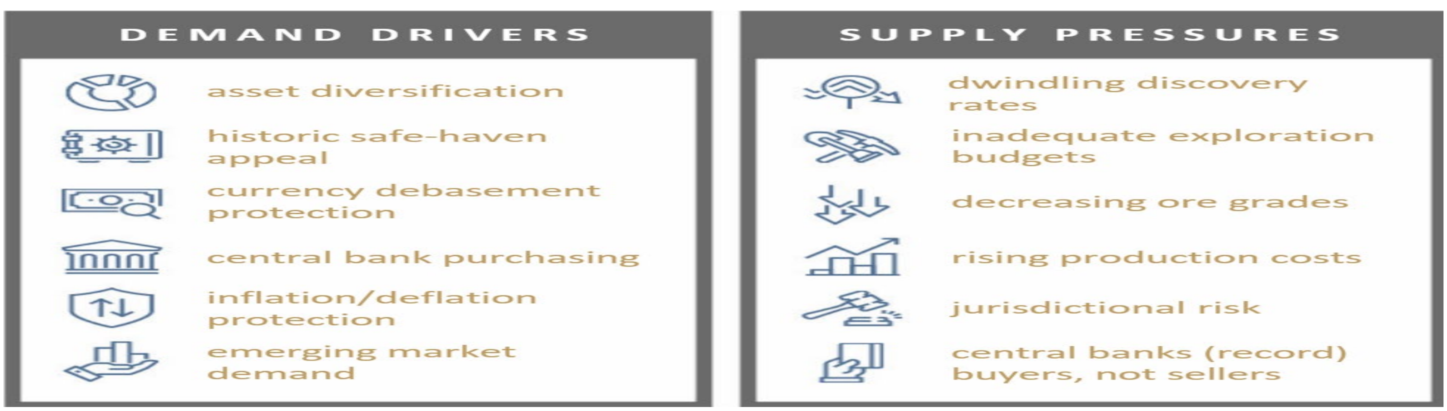
Intro

There were a handful of strong performers in 2022, but overall, most of the names are sharply lower YTD. Gold prices have been recovering in Q4 which could fuel better results moving forward while production issues remain a headwind.

Industry Backdrop & Investment Considerations

Precious metals have seen some weakness due to the rising USD and Rising Rates while on the Micro level facing cost inflation, rising cost of capital for development and valuation multiple compressing. In a range-bound gold price environment, capital returns, production growth and margin expansion can drive idiosyncratic outperformance.

Royalty/Streaming plays as opposed to the producers offer (1) protection from cost inflationary pressures, while continuing to benefit from production and price upside, (2) greater diversification among assets, geographies and commodities, and, (3) exposure to exploration and expansion upside with limited or no additional cost.



Indicators, Metrics & Stock Selection Framework

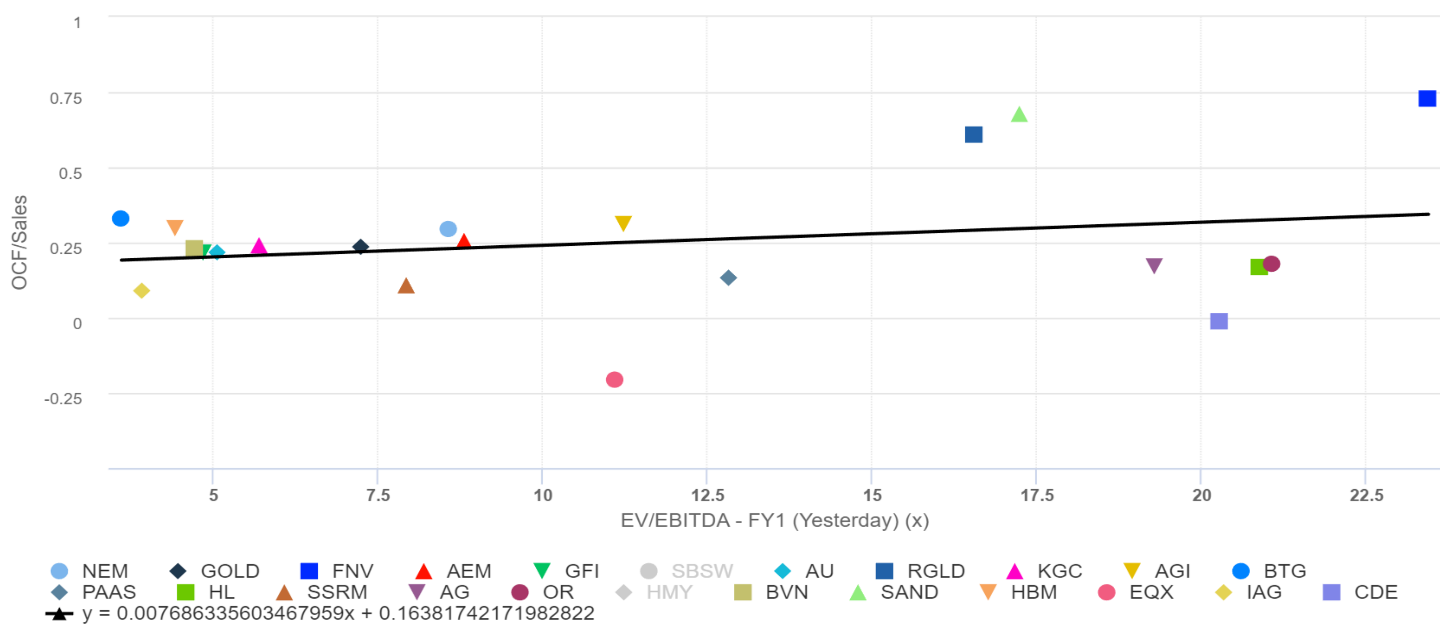
It is best to focus mostly on price to net asset value (P/NAV) and, to a lesser extent, price to cash flow (P/CF). P/NAV is very useful indicator of long-term value of the underlying reserves.

EV/EBITDA, EBITDA Growth, Debt to EBITDA, EBITDA Margins, ROIC, FCF Yield

Cash Flow Conversion ((Operating Cash Flow – Working Capital) / EBITDA), Capital Intensity (CAPEX/ (Operating Cash Flow – Working Capital), Debt to EBITDA

Valuation & Comps

EV/EBITDA to OCF/Sales



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Precious Metals							#VALUE!		
NEM	Newmont Corporation	36.8B	8.57X	26%	9.22%	32.27%	3.44%	2.32%	0.18X
GOLD	Barrick Gold Corp (USA)	29.2B	7.24X	23%	7.36%	45.71%	4.17%	5.65%	0.03X
FNV	FRANCO NEVADA Corp	27.1B	23.43X	27%	(0.77%)	84.39%	4.12%	8.7%	-0.49X
AEM	Agnico Eagle Mines Ltd (USA)	23.2B	8.81X	32%	1.94%	47.37%	3.48%	3.48%	0.78X
WPM	Wheaton Precious Metals Co	17.7B		24%	5.31%	72.55%	#VALUE!	5.71%	-0.13X
GFI	Gold Fields Limited (ADR)	10.0B	4.85X	36%	9.45%	58.91%	5.77%	11.76%	0.43X
SBSW	Sibanye Stillwater Ltd (ADR)	8.1B	47.85X	114%	(17.028%)	32.06%	1.40%	34.01%	-0.08X
AU	AngloGold Ashanti Limited (A	8.0B	5.07X	2%	(5.072%)		6.61%	8.23%	0.47X
RGLD	Royal Gold Inc (USA)	7.3B	16.54X	24%	3.42%	77.22%	-1.09%	14.82%	-0.14X
AUY	Yamana Gold Inc(USA)	5.3B		1%	5.95%	41.07%	#VALUE!	4.25%	0.33X
KGC	Kinross Gold Corporation (US	5.3B	5.70X	34%	(5.682%)	34.24%	4.13%	4.9%	0.39X
AGI	ALAMOS GOLD INC	3.9B	11.23X	-20%	16.4%	45.13%	-0.75%	4.74%	-1.24X
BTG	B2GOLD CORP	3.6B	3.60X	29%	(4.948%)	39.58%	5.28%	9.67%	-0.45X
PAAS	Pan American Silver Corp. (US	3.5B	12.84X	20%	(13.06%)	22.19%	-1.57%	3.71%	-0.45X
HL	Hecla Mining Company	3.4B	20.89X	25%	(0.796%)	18.15%	-0.53%	2.58%	1.26X
SSRM	SSR Mining Inc	3.1B	7.94X	76%	3.14%	(8.107%)	-0.58%	11.88%	-0.63X
AG	FIRST MAJESTIC SILVER CORP	2.4B	19.30X	38%	0.92%	15.12%	-6.26%	0.18%	-0.38X
OR	Osisko gold royalties Ltd	2.3B	21.07X	7%	11.87%	80.88%	-1.08%	1.28%	1.60X
HMY	Harmony Gold Mining Co. (AI	2.2B	62.53X	13%	(0.261%)	9.08%	#VALUE!	8.36%	0.13X
NG	NovaGold Resources Inc (USA	2.0B		-13%	84.87%		-1.26%	(30.884%)	1.70X
BVN	Compania de Minas Buenave	1.9B	4.71X				-0.92%		
SAND	SANDSTORM GOLD LTD	1.6B	17.25X	13%	15.38%	124.46%	-34.75%		-0.80X
MAG	MAG Silver Corp (USA)	1.5B	34.80X	13%	12.6%		-0.92%	2.26%	6.62X
EGO	Eldorado Gold Corp (USA)	1.5B		35%	38.01%	33.76%	#VALUE!	7.27%	0.05X
HBM	Hudbay Minerals Inc.	1.4B	4.44X	11%	(8.008%)	28.69%	7.61%	0.77%	1.60X
EQX	Equinox Gold Corp	1.1B	11.11X	75%	10.73%	10.48%	-48.14%	3.35%	0.43X
IAG	Iamgold Corp	1.0B		18%	57.76%	30.03%	#VALUE!	1.25%	-0.69X
CDE	Coeur Mining Inc	0.9B	20.26X	10%	70.49%	10.0%	-32.72%		1.45X

Management Commentary

Agnico Eagle (AEM) on industry consolidation…. "Consolidation is happening, it's going to continue to happen, and it's a good thing for the industry. And frankly, I'm talking my own book, but it really makes sense for -- it's hard for the junior companies to get financing these days. And even single-asset companies are having a hard time getting financing. And the best assets really belong in the strongest hands. And I think you're going to see that. It takes a little bit of time. But the important thing, Lawson, is that they have to be done in an intelligent manner with minimal sort of premiums, and they really have to be transactions that create value and create synergies. So absolutely, we think it's going to continue. We think it's a good thing."

OptionsHawk Executive Summary & Focus Stocks

Barrick (GOLD) screens best among the large caps into 2023 on a combination of FCF, valuation, margins and growth. For the smaller cap miners, **Alamos (AGI)** screens well while **Osisko (OR)** a high-margin royalties play that looks attractive to its larger peers on valuation/growth.

<u>Energy – E&P (Upstream)</u>

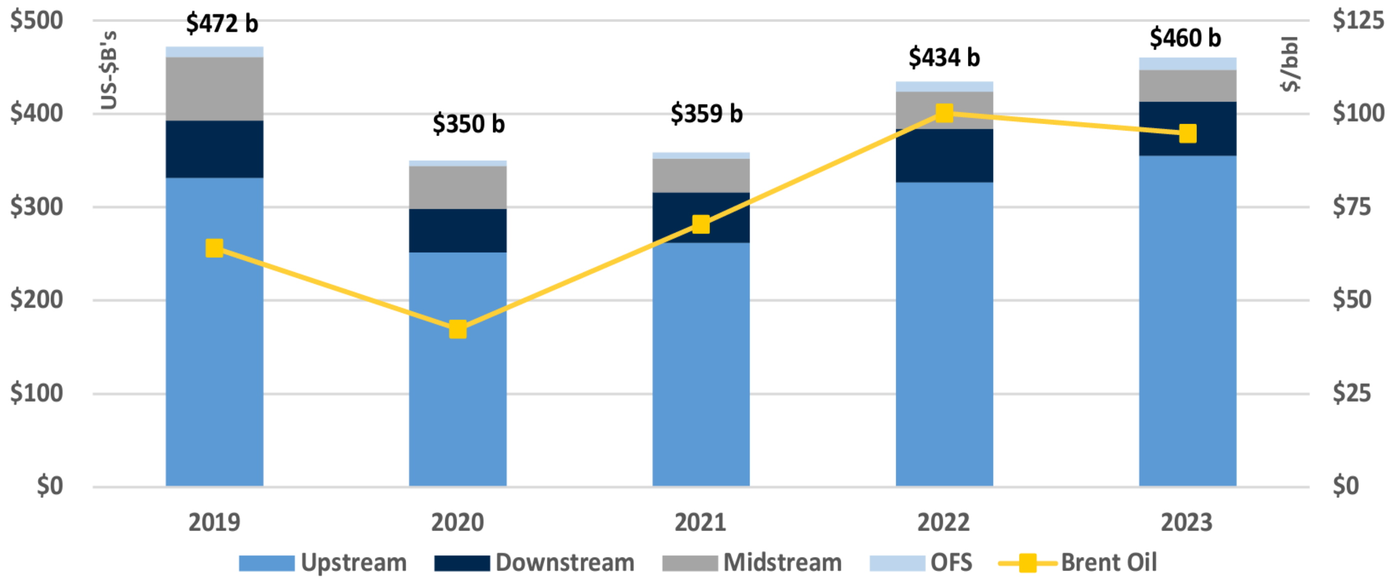
Components: XOM, CVX, COP, EOG, PXD, HES, OXY, CXO, CLR, FANG, NBL, PE, NFG, TPL, DVN, EQT, APA, MRO, WPX, CTRA, CNX, OVV, RRC, SWN, BSM, MUR, MGY, PDCE, CRK, MTDR, DEN, AR, WLL, PTEN, MNRL, SBR, TALO, KOS, RDS.B, TTE, BP, PBR, EQNR, E, EC, CNQ, SU, CVE, SSL, YPF, CPG, GPRK, SNP, PTC, CHK, SM, CRC, VET, CPE, ERF, NOG, LPI, TELL, WTI, PBT, SD, SHEL, REI, NBR, EGY, CHRD, PR

International & Private Peers: China Petro, PetroChina, Saudi Arabian Oil, Royal Dutch Shell, BP, Total SE, Lukoil, Gazprom, Rosneft, JX Holdings, Pemex, Equinor, Eni, PTT, SOCAR, Engie, Reliance Industries, Repsol, Hellenic Petro

Intro

In addition to capital discipline, inflation & tight supply chains are further tempering oil & gas supply growth. Early signs of core inventory exhaustion are also starting to show - creating a growing capital efficiency divide across E&Ps and a longer-term tailwind for oil & gas prices. Many E&Ps issued weaker than expected 4Q production guidance, including most Appalachia gas E&Ps and several key Permian producers. Over the past two years, much of the E&P sector has initiated shareholder-friendly cash return policies. After years of outspending cash flows, US E&Ps are taking a more disciplined approach. Low reinvestment rates limit the impact of inflation and changes in well-productivity on FCF. A US windfall tax could negatively impact investment but is unlikely to pass. While capex is moving higher next year, this is largely tied to inflation rather than incremental activity. Importantly, due to low reinvestment rates this higher spending does little to change the sector's attractive FCF profile. The median shareholder return yield, including dividends and buybacks, is ~8%.

While inflation remains a headwind, there are some green shoots with some early signs that costs are leveling off a bit. A very early read on 2023 spending points to a slight overall increase although dependent on larger project activity and crude prices. There are increasing political calls for more oil & gas activity to reduce global inflation. 2023 preliminary guidance forecasts global spending up another 5-10% next year.



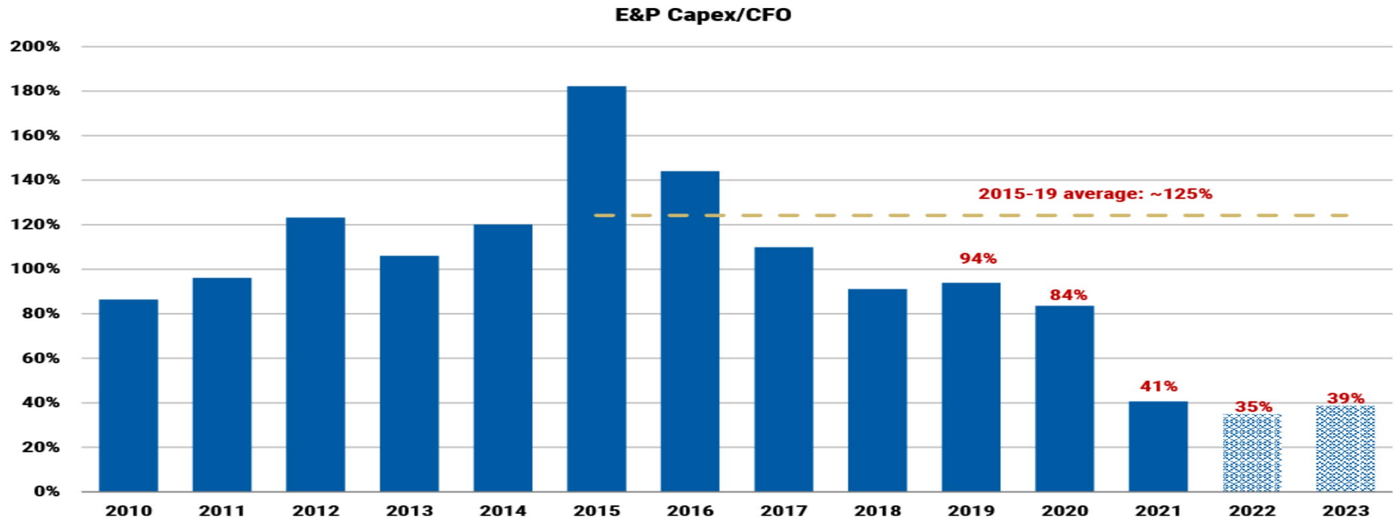
Industry Backdrop & Investment Considerations

Like the Metals & Mining group, the Oil & Gas E&P names also operate in a cyclical nature and much of the trading is closely correlated with the underlying commodity, Oil or Gas, and the weekly data points on supply and demand. Seasonality shows that February and April are strong months for the E&P names, while September, November and December tend to be weak.

There is no shortage of real-time data and analysis in these markets with the EIA and IEA releasing monthly reports breaking down production, rig counts and more by region. The EIA and API also release weekly data on production and supplies.

The E&P industry had undergone major changes as managements faced the worst oil crisis in decades and were forced to pivot a focus to cash returns, right-sizing balance sheets and return cash to investors in a recovery scenario. With oversupply the push for production growth is no longer primary and instead moving to a cash return model. The model shift will be tested if oil prices recover incentivizing management to start ramping up production again but until then the model has changed. E&P's need to increase free cash margin, whether through portfolio change, cash cost reduction or lower spending.

Since the start of 2022, US oil production has only grown ~200 Mbbl/d - roughly 1/10 of the peak growth seen in 2018. Capital discipline and the more transitory impacts of inflation & tight supply chains are certainly important drivers of this trend. More broadly though, there are early signs of more structural impediments to growth, including degrading well performance, early signs of inventory exhaustion as many key shale basins mature, and persistent infrastructure bottlenecks in some areas.



Indicators, Metrics & Stock Selection Framework

In evaluation this group, EV/EBITDA and P/FCF are valuable, but better metrics that are not as easily found such as EV/Proved Reserves, EV/2P and EV/Daily Production can give better insight. Many analysts prefer to use EV/DACF vs. P/CF as firms with higher levels of debt, or more leverage, will show a better P/CF ratio. This multiple takes the enterprise value and divides it by the sum of cash flows from operating activities and all financial charges that include interest expense, current income taxes and preferred shares. EV/GCI (Gross Cash Invested) is better than Price/Book for these names.

It is also always important to understand the cost leaders, names that can withstand down-cycles better with stronger balance sheets and a lower cost of breakeven. Similar to Financials, the balance sheet is often the most important with these stocks, as the reserves are the asset that will generate future revenues/earnings. The debt/cash flow ratio can be a useful gauge of balance sheet health. Revenues are difficult to model with the wild price swings, and a sensitivity analysis can be performed for an expected range and probability of outcomes, but also have to take into account the company's hedging efforts. P/E and Revenue multiples lose a lot of value because Energy companies have large depreciation numbers, impairment charges, write-downs, and unusual tax situations. EBITDAX is also a modification often used, the X being exploration expenses. Acreage valuation is another method using transactions in the various regions as a guide to figure out $M/Acre. Reserve replacement ratio is yet another metric for this industry and is a company's reserve additions for a given year divided by its production for that year.

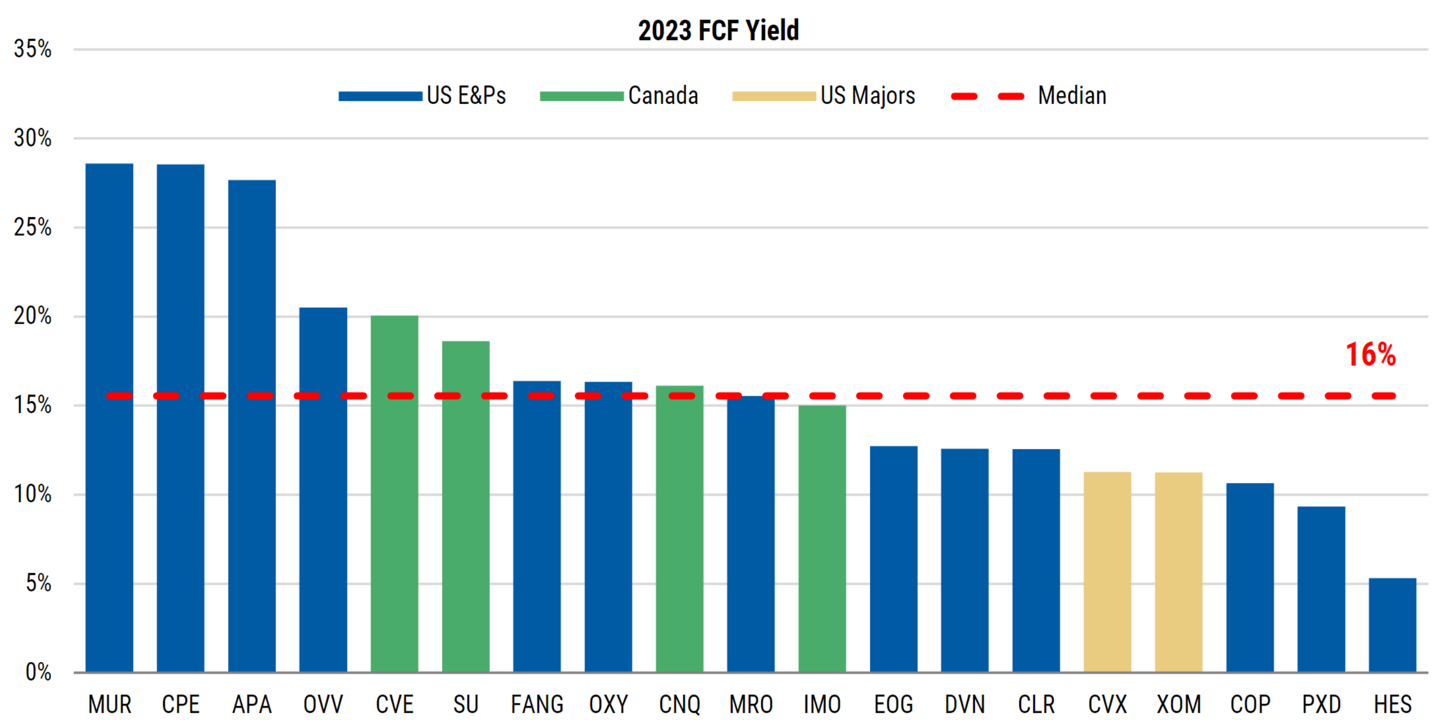
Return of Capital Employed (ROCE) is often used as a measure of capital efficiency as well as drilling rate of return while Cash Return on Capital Invested (CROCI) is also a preferred metric.

When assessing this group there are so many industry-specific metrics to observe but overall I am looking for cost leaders (efficient drilling), strong balance sheets, capital discipline, and a higher Oil mix and trading at a reasonable valuation.

Valuation & Comps

Company	Ticker	Rating	Price 11/4/22	Market Cap ($MM)	Price Target	PT Upside	EV/EBITDAX 2022E	EV/EBITDAX 2023E	EV/EBITDAX 2024E	Capex/ Operating Cash Flow 2022E	Capex/ Operating Cash Flow 2023E	Capex/ Operating Cash Flow 2024E	FCF yield (Pre-Div) 2022E	FCF yield (Pre-Div) 2023E	FCF yield (Pre-Div) 2024E	Total Yield (Dividends + Buybacks) 2022E	Total Yield (Dividends + Buybacks) 2023E	Total Yield (Dividends + Buybacks) 2024E	Net Debt/ EBITDAX 2022E	Net Debt/ EBITDAX 2023E	Net Debt/ EBITDAX 2024E	Prod Growth YoY 2022E	Prod Growth YoY 2023E	Prod Growth YoY 2024E
US Majors																								
Chevron Corp.	CVX	EW	$183.42	358,973	$196	7%	5.3x	5.1x	5.3x	23%	28%	31%	11%	10%	9%	6%	8%	8%	0.1x	-0.1x	-0.2x	-2%	7%	6%
Exxon Mobil Corporation	XOM	OW	$112.31	475,408	$114	2%	4.8x	4.9x	5.6x	24%	31%	36%	12%	10%	8%	6%	7%	6%	0.1x	-0.1x	-0.2x	1%	1%	3%
US Majors Median						**4%**	**5.0x**	**5.0x**	**5.5x**	**23%**	**30%**	**34%**	**12%**	**10%**	**8%**	**6%**	**7%**	**7%**	**0.1x**	**-0.1x**	**-0.2x**	**-1%**	**4%**	**4%**
Canada																								
Canadian Natural Resources Ltd	CNQ	EW	C$82.45	96,184	$91	10%	4.8x	4.3x	4.2x	28%	28%	29%	14%	14%	13%	11%	10%	13%	0.5x	0.4x	0.3x	6%	4%	3%
Cenovus Energy Inc	CVE	OW	C$28.49	57,818	$33	16%	4.2x	3.6x	3.8x	35%	31%	35%	14%	15%	12%	5%	13%	16%	0.4x	0.3x	0.4x	0%	3%	1%
Imperial Oil Ltd	IMO	EW	C$77.12	51,239	$69	-11%	5.2x	5.0x	5.8x	17%	30%	25%	13%	12%	9%	11%	6%	7%	0.1x	0.0x	-0.2x	-3%	3%	2%
Suncor Energy Inc	SU	OW	C$48.70	68,667	$61	25%	3.6x	3.5x	3.5x	33%	33%	35%	18%	16%	14%	11%	15%	16%	0.6x	0.5x	0.6x	3%	5%	3%
Canada Median						**13%**	**4.5x**	**4.0x**	**4.0x**	**30%**	**31%**	**32%**	**14%**	**14%**	**12%**	**11%**	**12%**	**15%**	**0.5x**	**0.3x**	**0.3x**	**2%**	**4%**	**3%**
Global E&Ps																								
APA Corp.	APA	OW	$48.99	16,755	$54	10%	3.2x	2.4x	2.1x	37%	33%	36%	16%	22%	18%	8%	15%	15%	0.7x	0.4x	0.2x	1%	6%	3%
ConocoPhillips	COP	OW	$132.32	171,466	$120	-9%	4.8x	4.6x	5.1x	31%	36%	42%	10%	9%	8%	9%	5%	5%	0.3x	0.1x	-0.1x	11%	3%	2%
Hess Corp.	HES	OW	$146.53	45,556	$123	-16%	9.5x	7.8x	6.6x	73%	68%	66%	5%	5%	5%	2%	3%	4%	1.1x	1.0x	0.8x	-0%	14%	19%
Marathon Oil Corp.	MRO	EW	$32.03	22,581	$27	-16%	4.4x	4.3x	4.2x	23%	36%	36%	19%	13%	13%	15%	13%	15%	0.3x	0.3x	0.2x	-1%	-1%	-1%
Murphy Oil Corp.	MUR	EW	$46.90	7,385	$48	2%	4.2x	2.4x	2.5x	45%	31%	31%	15%	25%	21%	2%	6%	12%	0.6x	0.0x	-0.4x	7%	19%	-3%
Occidental Petroleum Corp.	OXY	EW	$73.27	74,611	$73	-0%	4.6x	4.5x	5.0x	23%	31%	40%	18%	14%	10%	5%	6%	7%	1.2x	1.0x	1.0x	-1%	4%	2%
Global E&Ps Median						**-5%**	**4.5x**	**4.4x**	**4.6x**	**34%**	**35%**	**38%**	**16%**	**13%**	**12%**	**7%**	**6%**	**9%**	**0.6x**	**0.3x**	**0.2x**	**0%**	**5%**	**2%**
North American E&Ps																								
Devon Energy Corp.	DVN	EW	$71.48	47,177	$67	-6%	5.3x	4.6x	5.0x	29%	36%	42%	14%	12%	10%	9%	9%	8%	0.5x	0.3x	0.2x	8%	9%	2%
EOG Resources Inc.	EOG	OW	$142.23	83,631	$147	3%	5.4x	4.6x	5.3x	50%	37%	43%	9%	11%	8%	6%	6%	6%	0.0x	-0.2x	-0.3x	10%	5%	4%
Ovintiv Inc	OVV	OW	$53.41	13,919	$61	14%	3.2x	2.7x	2.5x	44%	46%	53%	18%	19%	14%	8%	15%	12%	0.6x	0.5x	0.4x	-5%	0%	1%
North American E&Ps Median						**3%**	**5.3x**	**4.6x**	**5.0x**	**44%**	**37%**	**43%**	**14%**	**12%**	**10%**	**8%**	**9%**	**8%**	**0.5x**	**0.3x**	**0.2x**	**8%**	**5%**	**2%**

Company	Ticker	Rating	Price	Market Cap	Price Target	PT Upside	EV/EBITDAX 2022E	EV/EBITDAX 2023E	EV/EBITDAX 2024E	Capex/OCF 2022E	Capex/OCF 2023E	Capex/OCF 2024E	FCF yield 2022E	FCF yield 2023E	FCF yield 2024E	Total Yield 2022E	Total Yield 2023E	Total Yield 2024E	Net Debt/EBITDAX 2022E	Net Debt/EBITDAX 2023E	Net Debt/EBITDAX 2024E	Prod Growth 2022E	Prod Growth 2023E	Prod Growth 2024E
Oil-Weighted Resource Plays																								
Permian Basin																								
Callon Petroleum Company	CPE	EW	$46.33	2,868	$60	30%	3.1x	2.3x	2.1x	66%	59%	65%	22%	26%	21%	0%	0%	0%	1.3x	0.8x	0.5x	8%	3%	2%
Diamondback Energy, Inc.	FANG	OW	$161.37	28,494	$175	8%	4.9x	4.3x	4.3x	31%	35%	36%	16%	14%	12%	5%	11%	11%	0.8x	0.6x	0.5x	1%	7%	2%
Pioneer Natural Resources Co.	PXD	UW	$255.06	64,785	$261	2%	5.3x	5.8x	6.0x	33%	45%	49%	13%	8%	7%	12%	7%	6%	0.3x	0.2x	0.1x	4%	2%	6%
Permian Basin E&Ps Median						**8%**	**4.9x**	**4.3x**	**4.3x**	**33%**	**45%**	**49%**	**16%**	**14%**	**12%**	**5%**	**7%**	**6%**	**0.8x**	**0.6x**	**0.5x**	**4%**	**3%**	**2%**
Bakken																								
Continental Resources Inc.	CLR	EW	$74.15	26,782	$74	-0%	3.8x	3.7x	3.6x	40%	46%	52%	16%	13%	11%	3%	4%	4%	0.5x	0.2x	0.0x	21%	2%	2%
Bakken E&Ps Median						**-0%**	**3.8x**	**3.7x**	**3.6x**	**40%**	**46%**	**52%**	**16%**	**13%**	**11%**	**3%**	**4%**	**4%**	**0.5x**	**0.2x**	**0.0x**	**21%**	**2%**	**2%**
Gas-Weighted Resource Plays																								
Antero Resources Corp.	AR	EW	$37.22	12,452	$34	-9%	3.8x	3.3x	3.4x	28%	32%	31%	20%	15%	12%	11%	15%	11%	0.3x	0.3x	0.1x	-1%	3%	1%
Coterra Energy Inc.	CTRA	EW	$28.93	23,231	$31	7%	3.2x	3.5x	3.8x	30%	34%	38%	19%	15%	13%	13%	11%	8%	0.1x	0.0x	-0.2x	37%	2%	-0%
EQT Corp.	EQT	OW	$41.08	17,943	$50	22%	3.4x	2.5x	2.2x	35%	30%	28%	16%	26%	24%	1%	7%	5%	0.9x	0.4x	-0.1x	9%	12%	1%
Range Resources Corp.	RRC	UW	$28.02	6,967	$28	-0%	3.6x	3.7x	3.2x	23%	31%	37%	23%	17%	14%	6%	9%	10%	0.7x	0.5x	0.3x	-0%	-0%	0%
Southwestern Energy Co.	SWN	EW	$6.81	7,615	$7.50	10%	3.9x	2.6x	1.7x	78%	60%	56%	10%	21%	25%	3%	11%	3%	1.6x	1.0x	0.5x	40%	-0%	2%
Gas E&Ps Median						**7%**	**3.6x**	**3.3x**	**3.2x**	**30%**	**32%**	**37%**	**19%**	**17%**	**14%**	**6%**	**11%**	**8%**	**0.7x**	**0.4x**	**0.1x**	**9%**	**2%**	**1%**



Management Commentary

Exxon (XOM) on industry variability…. “In the third quarter, crude prices moved back within the upper end of the 10-year range as higher supply slightly exceeded demand. Natural gas prices rose to record levels in the third quarter, reflecting concerns in Europe about the withdrawal of Russian supply as well as efforts to build inventory ahead of winter. While natural gas prices recently moderated, they remain well above the 10-year historical range. In the U.S., prices increased by about 15%, driven by higher summer cooling demand and inventory concerns. Refining margins remained well above the 10-year range due to inflated diesel crack spreads, resulting from expensive natural gas and high demand for diesel. Higher refinery runs and flat demand for gasoline in the U.S. resulted in refining margins declining from the second quarter. In contrast, global chemical margins fell below the bottom of the 10-year range, reflecting weakening global demand. Margins in North America and Europe have softened, with regional pricing moving closer to global parity as demand and logistics constraints relaxed."

Conoco (COP) on industry investment demand…. "I'd like to touch on a few big-picture thoughts that are top of mind for us. First, inflation and supply chain constraints continue across the entire economy and our industry. This is particularly true in the U.S. shale, where rapidly escalating costs combined with extremely tight supply are limiting the pace of industry-wide production growth. Second, we believe that the world is going to need investments in medium- and long-cycle production in addition to U.S. shale plays. The depth and quality of our U.S. unconventional inventory combined with our diverse global portfolio has us well positioned to meet these long-term supply challenges. And finally, a successful energy transition must meet society's fundamental need for secure, reliable and affordable energy while progressing to a lower carbon future. Now overall, we continue to believe the substitution of natural gas in place of coal represents an opportunity for significant reductions in global greenhouse gas emissions. This should drive global LNG demand and related opportunities well into the future. Putting this all together, we remain constructive on the outlook for the industry, and we have a deep portfolio of short-, medium- and longer-cycle low-cost supply assets that generate strong cash flow as we continue to deliver on our triple mandate."

EOG (EOG) on its fundamentals proposition…. "First, EOG's multi-basin organic exploration focus continues to improve the quality of our inventory. Capturing Tier 1 acreage across multiple high-return opportunities provides geographic diversity, product diversity and the flexibility to allocate capital across each asset at the correct pace to optimize returns. Second, EOG is a low-cost operator. We use technology to increase operational efficiency and capture select pieces of the value chain to keep both capital and operating costs low, thereby helping to reduce our breakevens and increase our free cash flow and income-generating potential. Third, Tim highlighted our financial performance and commitment to financial discipline that results in a 10% increase to our peer-leading regular dividend, a commitment to additional cash return with our announced special dividends and a best-in-class balance sheet."

Pioneer (PXD) on margin leadership… "For multiple consecutive quarters, Pioneer has delivered the highest cash margin of our entire peer group. Our unhedged oil-weighted production underpins strong price realizations, which when netted against our low cash costs, drive these unmatched results. As we've discussed previously, our low cash costs are a function of a robust infrastructure, low coupon debt and top-tier G&A. This best-in-class margin, paired with our highly efficient operations, support the highest free cash flow per BOE produced. Pioneer's projected ROCE continues to exceed all other sectors within the S&P 500, as well as the majors and the broader energy sector. Pairing our strong return profile with our discounted valuation, we believe results in an extremely compelling and durable investment opportunity for shareholders."

OptionsHawk Executive Summary & Focus Stocks

Following a strong cycle, the Oil & Gas Exploration group is set to come down from peak-cycle earnings but remains a group with strong FCF. Producers across the industry retained spending discipline while also pointing to inflation & supply chain tightness as additional impediments to growth. **Conoco (COP)** is the best operator of the mega-caps and a more defensive name for an industry downturn and with shareholder returns also in focus, a name that should outperform. In the $20B to $75B market cap tier, **EOG Resources (EOG)** is the preferred name with its industry-best margins and more defensible earnings. In the $8B to $20B market cap tier, **Apache (APA) is** a preferred name for its industry-best capital returns and upgraded portfolio. The industry could see another wave of consolidation with a few potential targets being **Laredo (LPI), Matador (MTDR),** and **Magnolia (MGY)**. **National Fuel & Gas (NFG)** stands out among small caps with high margins and EBITDA seen maintaining growth. **Vermillion (VET)** is another standout small cap on FCF, valuation and margins.

Energy – Energy Services

Components: SLB, HAL, BKR, NOV, GTLS, CHX, HP, VAL, FTI, NE, WHD, PTEN, LBRT, PFHC, EE, WFRD, RIG, NEX, RES, USAC, ERII, DNOW, OII, PUMP, AROC, SLCA, WTTR, HLX, DRQ, CLB, MRC, VTOL, NESR, SOI, BOOM, OIS

International & Private Peers: China Oilfield Services, Weir, Schneider Electric, ABB, Siemens, ADES International, Coretrax, Churchill Drilling, GAC Group, Nexans, KCA Deutag, Topaz Energy & Marine, Proserv, Welltec, Tendeka, Aveva, Sparrows Group, Wavefront, Jotun

Intro

The energy services group saw fantastic performance in 2022 and is less susceptible to the downturn in oil prices as the industry remains disciplined and continues its capex. Fundamentals in the oil services industry are the best they've been in years. SLB management remains quite upbeat about the resilience and opportunity set in the coming upstream investment cycle.

	Capex Guidance ($MM)				YoY % Chg.		
Operator	2019A	2020A	2021A	2022E	2020A	2021A	2022E
US Oil Focused Operators							
ExxonMobil	31,148	21,374	16,595	22,500	(31%)	(22%)	36%
Chevron	23,518	14,299	11,720	15,300	(39%)	(18%)	31%
ConocoPhillips	11,518	7,413	6,172	7,800	(36%)	(17%)	26%
EOG Resources	6,234	3,490	3,909	4,500	(44%)	12%	15%
Occidental Petroleum	8,543	2,535	2,870	4,100	(70%)	13%	43%
Pioneer Natural Resources	5,520	2,703	3,427	3,700	(51%)	27%	8%
Hess	2,769	1,786	1,829	2,700	(36%)	2%	48%
Continental Resources	2,662	1,159	1,541	2,650	(56%)	33%	72%
Devon Energy	3,526	1,983	1,842	2,300	(44%)	(7%)	25%
Diamondback Energy	3,832	2,254	1,487	1,860	(41%)	(34%)	25%
Ovintiv	2,626	1,736	1,519	1,750	(34%)	(13%)	15%
Apache	2,366	988	1,062	1,725	(58%)	7%	62%
Marathon Oil	2,684	1,162	1,032	1,300	(57%)	(11%)	26%
Murphy Oil	1,436	805	688	925	(44%)	(14%)	34%
Callon Petroleum	1,280	611	666	800	(52%)	9%	20%

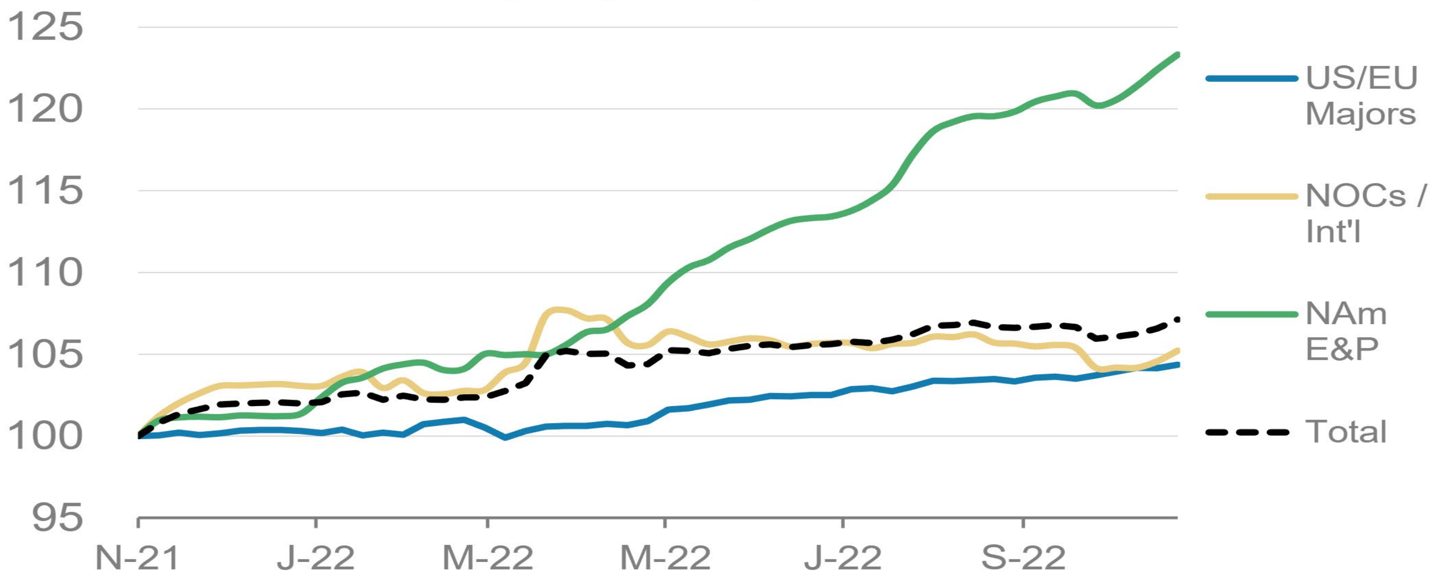
Industry Backdrop & Investment Considerations

A recession remains top of mind as a downside risk, but oil & gas markets remain tight. Service companies are set for activity growth but are exercising capital discipline — a strong recipe for pricing power. Across the value chain, things look the best they have in a while. Onshore NAm service pricing is extremely strong, and the mark-to-market effects for 2023 should drive meaningful earnings revisions. The offshore rig market has recovered from a nearly decade-long downturn, and floating rig rates have taken a major step higher.

Avg. Rig Count in Period	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E
US Land Rigs:											
Horizontal	1,274	748	404	737	900	826	385	427	662	772	800
Vertical/Directional	515	195	84	117	111	93	33	32	46	50	50
US Land	1,789	943	487	853	1,011	918	418	459	708	822	850
Canada Land	378	190	129	205	189	132	88	129	180	185	185
NAm Land	**2,167**	**1,133**	**616**	**1,058**	**1,199**	**1,050**	**506**	**588**	**888**	**1,007**	**1,035**
Int'l Land Rigs:											
Middle East	360	356	340	343	350	358	295	231	269	315	344
Latin America	323	257	162	154	164	160	75	105	132	151	159
Asia / Pacific	138	126	104	123	136	133	110	112	120	127	130
Africa	94	74	69	71	81	94	64	58	63	66	70
Europe	95	71	60	60	54	57	52	41	42	44	45
Int'l Land	**1,011**	**884**	**734**	**750**	**785**	**802**	**596**	**547**	**626**	**703**	**748**
Offshore Rigs:											
Floaters	257	222	155	121	121	129	109	107	116	125	133
Jackups	407	374	308	291	299	321	313	315	318	332	338
Global Offshore	**665**	**596**	**463**	**412**	**420**	**450**	**422**	**422**	**434**	**457**	**471**
Global Rig Count*	**3,843**	**2,613**	**1,814**	**2,221**	**2,404**	**2,302**	**1,524**	**1,557**	**1,948**	**2,167**	**2,254**

Seq. Change	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E
US Land Rigs:											
Horizontal	16%	(41%)	(46%)	82%	22%	(8%)	(53%)	11%	55%	17%	4%
Vertical/Directional	(12%)	(62%)	(57%)	39%	(5%)	(16%)	(64%)	(4%)	46%	8%	–
US Land	6%	(47%)	(48%)	75%	18%	(9%)	(54%)	10%	54%	16%	3%
Canada Land	8%	(50%)	(32%)	59%	(8%)	(30%)	(33%)	47%	39%	3%	–
NAm Land	**6%**	**(48%)**	**(46%)**	**72%**	**13%**	**(12%)**	**(52%)**	**16%**	**51%**	**13%**	**3%**
Int'l Land Rigs:											
Middle East	10%	(1%)	(4%)	1%	2%	2%	(18%)	(22%)	16%	17%	9%
Latin America	(3%)	(20%)	(37%)	(5%)	6%	(2%)	(53%)	40%	26%	14%	6%
Asia / Pacific	(3%)	(9%)	(18%)	18%	10%	(2%)	(17%)	2%	7%	5%	3%
Africa	5%	(22%)	(7%)	3%	15%	16%	(32%)	(10%)	8%	6%	5%
Europe	12%	(26%)	(15%)	(0%)	(9%)	6%	(9%)	(21%)	3%	5%	1%
Int'l Land	**3%**	**(13%)**	**(17%)**	**2%**	**5%**	**2%**	**(26%)**	**(8%)**	**15%**	**12%**	**6%**
Offshore Rigs:											
Floaters	1%	(14%)	(30%)	(22%)	(0%)	7%	(16%)	(2%)	9%	8%	6%
Jackups	3%	(8%)	(18%)	(6%)	3%	7%	(2%)	1%	1%	4%	2%
Global Offshore	**2%**	**(10%)**	**(22%)**	**(11%)**	**2%**	**7%**	**(6%)**	**(0%)**	**3%**	**5%**	**3%**
Global Rig Count*	**5%**	**(32%)**	**(31%)**	**22%**	**8%**	**(4%)**	**(34%)**	**2%**	**25%**	**11%**	**4%**

Indexed Consensus Capex (2023E)



Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EV/Revenues, EBITDA margins and looking at debt levels with balance sheet ratios will all be appropriate in analyzing this group.

Valuation & Comps

OCF/Sales to EV/EBITDA

Ticker	MS Rating	Recent Price	Price Target	Div. Yield	Mkt Cap ($MM)	Ent. Value ($MM)	EV/EBITDA NTM	EV/EBITDA 2022E	EV/EBITDA 2023E	EV/EBITDA 2024E	P/E NTM	P/E 2022E	P/E 2023E	P/E 2024E	Unlevered FCF/EV NTM	Unlevered FCF/EV 2022E	Unlevered FCF/EV 2023E	Unlevered FCF/EV 2024E	Net Debt/EBITDA NTM	Net Debt/EBITDA 2022E	Net Debt/EBITDA 2023E	Net Debt/EBITDA 2024E
Global Services & Equipment																						
SLB	OW	$42.02	$48.00	1.7%	59,433	71,672	9.6x	10.9x	8.2x	7.1x	16.2x	20.2x	13.8x	11.7x	5.7%	4.6%	7.1%	8.2%	1.2x	1.3x	0.7x	0.4x
HAL	OW	$29.80	$42.00	2.2%	27,027	34,281	7.2x	8.2x	6.2x	5.3x	11.6x	14.5x	9.9x	8.4x	6.7%	4.7%	8.4%	10.2%	1.1x	1.3x	0.8x	0.5x
BKR	OW	$22.64	$31.00	3.2%	23,065	27,433	8.5x	9.4x	7.2x	6.5x	16.7x	23.9x	13.5x	11.6x	4.6%	4.0%	6.5%	6.7%	1.4x	1.5x	1.0x	0.7x
TS	OW	$26.91	$35.00	6.3%	15,819	15,577	3.9x	4.7x	3.5x	4.1x	5.6x	6.3x	5.6x	7.4x	14.8%	7.5%	20.0%	18.9%	NM	NM	NM	NM
NOV	EW	$17.89	$20.00	1.1%	7,027	8,232	9.4x	12.2x	7.8x	6.3x	18.4x	26.1x	15.6x	12.4x	4.9%	NM	6.6%	8.9%	0.6x	1.0x	0.3x	NM
Median							*8.5x*	*9.4x*	*7.2x*	*6.3x*	*16.2x*	*20.2x*	*13.5x*	*11.6x*	*5.7%*	*4.7%*	*7.1%*	*8.9%*	*1.2x*	*1.3x*	*0.8x*	*0.5x*
Small Cap Services & Equipment																						
HP	EW	$41.20	$55.00	2.4%	4,338	4,615	5.0x	10.9x	4.3x	3.1x	13.3x	NM	10.6x	8.0x	7.7%	0.3%	8.4%	14.8%	NM	NM	NM	NM
WHD	EW	$40.94	$55.00	1.1%	3,106	2,841	10.3x	12.9x	8.8x	7.3x	17.1x	21.2x	14.6x	13.0x	5.4%	3.5%	6.3%	8.6%	NM	NM	NM	NM
PTEN	OW	$13.78	$21.00	1.2%	2,988	3,916	4.1x	6.0x	3.2x	2.4x	10.1x	31.1x	7.1x	5.8x	8.8%	2.1%	12.1%	19.0%	0.6x	1.1x	0.3x	NM
LBRT	OW	$14.06	$21.00	–	2,632	2,975	2.7x	3.9x	2.0x	1.3x	4.9x	7.0x	4.3x	3.8x	8.7%	0.9%	16.8%	28.6%	NM	0.2x	NM	NM
PFHC	OW	$17.11	$30.00	–	2,436	2,842	2.6x	3.8x	2.0x	1.3x	4.6x	6.3x	3.9x	3.5x	19.5%	8.5%	23.0%	30.1%	0.2x	0.7x	NM	NM
NEX	EW	$9.12	$13.00	–	2,227	2,549	2.9x	4.0x	2.2x	1.4x	5.0x	7.3x	4.2x	4.6x	18.8%	13.7%	23.1%	28.9%	NM	0.0x	NM	NM
RIG	EW	$2.86	$4.00	–	2,018	8,622	9.6x	11.4x	7.8x	6.7x	NM	NM	NM	44.3x	NM	NM	7.5%	10.5%	7.4x	8.9x	6.0x	4.8x
NBR	UW	$118.02	$135.00	–	1,112	4,147	5.0x	6.7x	4.2x	3.4x	NM	NM	7.8x	4.5x	9.2%	5.4%	9.9%	12.4%	2.9x	3.9x	2.3x	1.6x
SLCA	EW	$11.32	$17.00	–	855	1,855	4.6x	5.5x	4.2x	3.3x	7.2x	10.9x	6.7x	5.4x	11.9%	11.8%	14.0%	17.3%	2.1x	2.7x	1.7x	1.0x
CLB	UW	$15.48	$20.00	0.3%	717	950	11.7x	15.0x	9.3x	7.0x	20.1x	28.3x	14.6x	10.9x	4.8%	2.7%	6.5%	9.5%	1.4x	2.5x	0.8x	0.0x
Median							*4.8x*	*6.3x*	*4.2x*	*3.2x*	*8.6x*	*10.9x*	*7.1x*	*5.6x*	*8.8%*	*3.5%*	*11.0%*	*16.1%*	*1.8x*	*1.8x*	*1.7x*	*1.3x*
EPCI & Subsea																						
FTI	EW	$9.25	$8.50	1.4%	4,183	6,856		6.2x	5.7x	NA		NM	33.6x	NM		9.8%	4.6%	NM		0.9x	0.8x	NM
SUBC-OS	EW	NKr94.66	NKr87.00	0.2%	2,642	2,625		4.4x	3.2x	NA		33.0x	12.4x	NA		10.4%	12.6%	NM		NM	NM	NM
TE-PA	OW	€ 12.17	€ 15.20	3.7%	2,123	2,748		2.4x	3.0x	NA		6.6x	7.9x	NA		19.5%	34.8%	NM		NM	NM	NM
SPMI-MI	EW	€ 0.67	€ 5.20	–	1,301	NA		NA	NA	NA		NA	NA	NA		NM	NM	NM		2.0x	1.6x	NM
ACCA-OL	EW	NKr12.88	NA	–	724	603		NM	NM	NM		NM	NM	NM		NM	0.1%	1.3%		NM	NM	NM
Median								*4.4x*	*3.2x*	*NM*		*19.8x*	*12.4x*	*NM*		*10.4%*	*8.6%*	*1.3%*		*1.5x*	*1.2x*	*NM*

Management Commentary

Schlumberger (SLB) on the macroenvironment and pricing…"We believe in a balanced transition for the planet. While the world accelerates the transition of the energy ecosystem to a lower carbon future, the recent energy crisis has led policymakers and stakeholders across the world to realize that oil and gas investment remains absolutely essential to the fabric of our society. This realization is prompting governments and our industry to reassess the long-term strategies for oil and gas to address vulnerabilities and redundancy in sources of supply and to create a more balanced transition. One that delivers energy security, decarbonization and sustainable development. As a result, the energy industry at large and the oil and gas industry in particular will undergo a significant renaissance for many years to come. As you know, the oil and gas sector is undergoing a convergence of strong market fundamentals, capital discipline and the quest for energy security. We are in the early stage of a very distinctive growth cycle characterized by supply-led investment decisions. The fundamentals are aligned with our core business as investment is increasingly pivoting to international basins, both in oil and in gas resource plays. This activity uptake includes a strong offshore resurgence and a significant commitment to expand capacity in the Middle East. Both represent long-cycle investments spanning multiple years, and they represent a significant baseload of activity that would outlast near-term demand volatility. The offshore outlook, combining shallow and deepwater, will rebound to activity levels far exceeding pre-pandemic levels. At the same time, the Middle East investment outlook over the next [few] years will result in a new record in upstream spend for that region. Additionally, the pledge for capital discipline, combined with the stretched capacity in the service industry, will continue to a positive pricing environment. Considering these market dynamics and absent a major market disruption, we maintained a view that upstream spending is very resilient and decoupled from near-term demand. And we foresee capital investment to continue growing at double-digit CAGR in the upstream sector for years ahead. The pandemic has been actually a catalyst for digital adoption. Our industry is doubling down on cloud computing, data analytics and digital operations. This will result in an accretive and fast-growing digital market throughout the decade, beyond the current upcycle as the industry harnesses the power of digital technology to step change performance and to drive decarbonization."

Halliburton (HAL) on supply/demand dynamics… "Oil and gas supply remains fundamentally tight due to multiple years of underinvestment. This tightness is apparent in historically low inventory levels, production levels well below expectations and temporary actions such as the largest ever SPR release. Against tight supply, demand for oil and gas is strong, and we believe it will remain so. While broader market volatility is clear, what we see in our business is strong and growing demand for equipment and services. There is no immediate solution to balance the world's demand for secure and reliable oil and gas against its limited supply. I believe that only multiple years of increased investment in existing and new sources of production will solve the short supply. The effective solution to short supply is conventional and unconventional, deepwater and shallow water, new and existing developments and short- and long-cycle barrels. All of it. Looking forward, I see activity increasing around the world, from the smallest to the largest countries and producers. I expect the areas of strongest growth will be the Middle East, led by Saudi Arabia, but with meaningful activity increases in the UAE, Qatar, Iraq and Kuwait. Elsewhere, Brazil, Guyana and many others have also signaled a commitment to increased activity."

Baker Hughes (BKR) on operator discipline…. "Despite these economic challenges, we remain constructive on the outlook for oil and gas and believe that underlying fundamentals remain supportive of a multiyear upturn in global upstream spending. Operators around the world have shown a great deal of financial discipline, which we expect to translate into a more durable upstream spending cycle, even in the face of an unpredictable commodity price environment. In the oil market, we expect continued price volatility as demand growth likely softens under the weight of higher interest rates and inflationary pressures. However, we expect supply constraints and production discipline to largely offset any demand weakness. This should support price levels that are conducive to driving double-digit upstream spending growth in 2023. In the natural gas and LNG markets, prices remained elevated as a multitude of factors increased tensions on an already stressed global gas market. Europe's surging demand for LNG has redirected cargoes from other regions and created an exceptionally tight global market that could get even tighter in 2023. This situation has resulted in record-high LNG prices but has also slowed down switching from coal to gas in some developing countries. We believe that significant investment is still required over the next 5 to 10 years to ensure natural gas' position as a key part of the energy transition. On the new energy front, recent policy movements in Europe and the United States are likely to help support a significant increase in clean energy development. In the U.S., the Inflation Reduction Act should be particularly impactful in accelerating the development of green hydrogen, CCUS and direct air capture."

OptionsHawk Executive Summary & Focus Stocks

The three large cap plays trade in the 9-12X EBITDA range and **Schlumberger (SLB)** continues to stand out as the top name with its strong growth and margins as it invests heavily in digital. There are several names in the $4B to $7B range where **Helmerich and Payne (HP)** screens attractive with high margins and trading at a steep discount. Among the small caps, **Cactus (WHD)** is a top operator with high margins and market share gains though carries a premium valuation while **Nextier (NEX)** is one of the more interesting small cap values with strong metrics seeing margin expansion. **USA Compression (USAC)** is a name that would make sense as an acquisition target along with **Pro Petro (PUMP)**. **Energy Recovery (ERII)** is a rapid growth name at a high valuation, but its PX technology is benefitting major industries such as Desalination, Industrial Wastewater Treatment and CO2 Refrigeration.

Energy – Midstream

Components: AM, AMID, ANDX, BPL, BPMP, BSM, CAPL, CEQP, CLMT, CNXM, CQP, DCP, DKL, ENB, ENBL, ENLC, EPD, EQM, ET, FI, GEL, HEP, HESM, KMI, LNG, MMP, MPLX, NBLX, NS, OKE, PAA, PAGP, PBA, PBFX, PSXP, SEMG, SHLX, SRLP, TCP, TGE, TRP, WES, WLKP, WMB, RTLR, TRGP, VNOM, FLNG

International & Private Peers

Intro

Midstream stocks saw a major recovery in 2022 with a stronger energy backdrop though that outperformance could see some reversion in 2023 after its typical seasonal outperformance through mid-January.

Industry Backdrop & Investment Considerations

The midstream sector has evolved from a phase that prioritized growth (as defined by large capital budgets and outsized distribution growth) to a more mature stage focused on financial discipline, portfolio optimization and cash flow. Key themes are Improving FCF, Exposure Types (Basin, Commodity Type, and Customers), Exports Driving Growth, and Consolidation/M&A. Given ongoing producer capital discipline, expect more measured production growth.

Model Type	Midstream 1.0	Midstream 2.0
Capex	Project capture plentiful	More competition as build-out growth matures: high-grading capital programs, JVs, etc
IDRs	Yes	No
Funding	Reliance on capital markets	Self-fund equity portion of capex program, assuming 50/50 debt equity
Leverage	Higher tolerance on leverage creep	Lower the better
Distribution Coverage	Full payout model resulting in 1.0-1.2x coverage	Higher the better (1.3x or better as a soft reference)
Growth factors	Distribution/dividend per unit/share	DCF/unit (or share)
Valuation metric	Single factor: Yield	Multi factor: EV/EBITDA; P/DCF; potentially FCF yield

Growing US exports of crude oil, NGLs and LNG has led to higher utilization of existing pipeline, storage and dock infrastructure and should drive the need for further expansions over the medium term. Exports provide opportunities for growth, but also expose the midstream sector to global risks such as trade, demand, and indirect commodity exposure dynamics.

The midstream sector has materially evolved on multiple fronts as the US shale revolution drove the need for significant build-out of North American oil and gas infrastructure. Given the US emergence as a net exporter of major energy commodities (crude oil, NGLs, natural gas), the midstream sector continues to mature with some pockets of growth (largely projects that support exports). There has been a structural shift in E&P behavior as companies focus on capital discipline, cost reduction and free cash flow. Consequently, production growth is expected to moderate, which in turn implies midstream growth capex should moderate as well.

Similar to E&P's, midstream names have focused on improving free cash flow, which will enhance their overall financial flexibility.

Larger distribution coverage allows for flexibility around debt reduction and growth capital funding. Another key factor investors are using to differentiate winners and losers in midstream is by commodity-type exposure. Contract types tend to fall into three categories with Low-Risk which are fee-based and non-volume sensitive, Medium Risk which are fee-based or fixed margin and sensitive to volume, and lastly High Risk which are non fee-based.

One notable seasonal pattern has been the consistent positive performance of MLPs over more than two decades around the beginning of each new year, mostly clearly seen when viewing the time frame running from the second half of December through the duration of January. While a bit difficult to rationalize, the theory around the consistency of the relationship generally involves inefficiency created by the shallowness of institutional participation in the sector, abatement of tax loss selling by mid-December, timing of K-1 avoidance/acceptance, and January distribution capture strategies.

The US midstream industry has entered a more mature phase in its lifecycle and the industry should no longer focus on dividend growth as the sole driver of value. Management teams should instead take a more balanced approach, and focus on capital-efficient projects that generate locked-in returns above their cost of capital, and seek to minimize (or eliminate) their external equity financing.

Indicators, Metrics & Stock Selection Framework

The Distributable Cash Flow Coverage ratio is one way to evaluate the health of a MLP. In general, we want to concentrate on names with growing and safe distributions as these are utilized more as instruments for income rather than growth. Over the past few years, the MLP sector has lagged the overall market as well as the broader energy sector. This underperformance has been driven by a change in investor preferences for self-funded capital-spending plans, which is contrary to the typical MLP model that relies on continual equity and debt issuance to fund growth capital. Changes in pipeline rate-making policy and distribution cuts by several MLPs have negatively impacted investor sentiment towards MLPs. MLPs typically operate toll road or fee-based business models. Just as the company that owns the toll road makes a set fee per mile driven, regardless of the cost of the car, MLPs earn a set fee for each barrel of oil, cubic foot of natural gas, or ton of coal that is processed, transported, or stored, regardless of the cost of the hydrocarbon. The most common valuation metrics for MLPs are price to distributable cash flow (P/DCF), enterprise value to EBITDA (EV/EBITDA), yield spread to the 10-year Treasury, and the dividend discount model. Generally, price to earnings (P/E) is not used. MLPs invest so heavily in hard assets that depreciation accounting can occasionally make their earnings appear negative, while their cash flows continue to be stable and growing. For this reason, a multi-stage DCF discount model is preferred over all others. Since DCF is a measure of the cash flow available to be paid out to investors every quarter, it is a much more accurate reflection of the health and sustainability of an MLP.

ROIC-WACC versus expected 3-year EBITDA CAGR is a good way to look at relative valuation across the group. In general, a combination of higher growth rate and ROIC – WACC should deserve premium EV/EBITDA multiples and vice versa. Investors can enhance their stock picking by screening for companies with strong returns, good balance sheets, and strong DCF/share growth, in addition to above-average dividend growth.

Valuation & Comps

Dividend Yields and FCF Ex-Dividends / Market Cap

Company	Ticker	EV / EBITDA 2021	EV / EBITDA 2022	EV / EBITDA 2023	Dividend Yield 2021	Dividend Yield 2022	Dividend Yield 2023	Net Debt / EBITDA 2021	Net Debt / EBITDA 2022	Net Debt / EBITDA 2023
Antero Midstream	AM	9.8x	10.0x	9.2x	7.9%	7.9%	7.9%	3.6x	3.8x	3.5x
DT Midstream, Inc.	DTM	12.9x	11.5x	10.0x	8.0%	4.3%	4.5%	3.8x	4.1x	3.5x
Enbridge Inc	ENB	13.6x	12.5x	12.4x	6.2%	6.3%	6.5%	4.9x	4.8x	4.8x
EnLink Midstream	ENLC	11.4x	9.3x	8.4x	3.1%	3.5%	3.9%	4.1x	3.5x	3.2x
Enterprise Products	EPD	9.8x	9.1x	9.1x	7.3%	7.6%	8.0%	3.2x	3.1x	3.0x
Energy Transfer	ET	7.5x	7.5x	7.2x	5.0%	8.0%	10.2%	4.0x	3.8x	3.7x
Equitrans Midstream	ETRN	8.0x	8.3x	7.8x	7.4%	7.4%	7.4%	4.7x	4.9x	4.5x
Hess Midstream	HESM	11.9x	10.6x	9.3x	6.4%	7.3%	7.6%	2.8x	3.0x	2.6x
Kinder Morgan Inc.	KMI	9.6x	10.1x	10.0x	5.7%	5.8%	6.0%	3.9x	4.2x	4.2x
Kinetik Holdings	KNTK	NA	9.4x	8.7x	NA	9.0%	9.4%	NA	3.9x	3.5x
Magellan Midstream	MMP	11.7x	11.4x	10.3x	7.9%	7.9%	8.0%	3.6x	3.7x	3.4x
MPLX	MPLX	9.9x	9.6x	9.4x	9.9%	8.4%	8.8%	3.5x	3.4x	3.3x
ONEOK Inc.	OKE	12.9x	11.9x	11.3x	5.6%	5.6%	5.6%	4.3x	3.8x	3.6x
Plains All American	PAA	8.9x	8.6x	7.8x	5.9%	7.1%	7.8%	5.0x	4.0x	3.5x
Targa Resources	TRGP	12.0x	9.5x	8.0x	0.9%	2.0%	2.5%	3.6x	3.6x	3.1x
TC Energy	TRP	11.5x	11.8x	11.3x	6.0%	6.2%	6.4%	5.3x	5.4x	5.4x
Western Midstream	WES	9.4x	8.3x	7.6x	4.5%	7.0%	7.0%	3.4x	3.1x	2.8x
Williams	WMB	11.9x	10.9x	10.3x	4.7%	4.9%	5.1%	3.9x	3.5x	3.1x
Median		**11.4x**	**9.8x**	**9.3x**	**6.0%**	**7.1%**	**7.2%**	**3.9x**	**3.8x**	**3.5x**

Company	Ticker	DCF Yield 2021	DCF Yield 2022	DCF Yield 2023	FCF Yield 2021	FCF Yield 2022	FCF Yield 2023	FCF Yield (After Dividends) 2021	FCF Yield (After Dividends) 2022	FCF Yield (After Dividends) 2023
Antero Midstream	AM	12.3%	12.2%	12.9%	8.7%	7.6%	9.7%	0.8%	(0.3%)	1.8%
DT Midstream, Inc.	DTM	10.2%	10.6%	11.8%	7.6%	(2.3%)	6.6%	(0.4%)	(6.6%)	2.2%
Enbridge Inc	ENB	9.1%	10.1%	10.2%	1.3%	4.9%	4.4%	(4.9%)	(1.3%)	(2.1%)
EnLink Midstream	ENLC	12.4%	16.2%	17.9%	10.7%	7.4%	12.5%	7.6%	3.9%	8.6%
Enterprise Products	EPD	12.1%	13.9%	13.8%	11.5%	10.0%	9.8%	4.2%	2.4%	1.8%
Energy Transfer	ET	23.9%	20.6%	19.9%	24.3%	16.1%	16.0%	19.2%	8.1%	5.8%
Equitrans Midstream	ETRN	-	-	-	16.7%	14.3%	18.8%	9.4%	7.0%	11.5%
Hess Midstream	HESM	9.7%	11.1%	12.7%	7.6%	7.9%	9.5%	1.2%	0.6%	1.9%
Kinder Morgan Inc.	KMI	12.7%	12.0%	11.8%	10.2%	6.2%	6.0%	4.5%	0.4%	0.0%
Kinetik Holdings	KNTK	NA	14.7%	16.1%	NA	8.7%	7.8%	NA	7.8%	0.3%
Magellan Midstream	MMP	9.7%	9.9%	11.0%	9.3%	7.0%	10.0%	1.4%	(0.9%)	2.0%
MPLX	MPLX	13.4%	13.8%	13.8%	12.6%	12.6%	12.3%	2.7%	4.2%	3.6%
ONEOK Inc.	OKE	8.3%	8.9%	9.3%	6.2%	5.0%	5.8%	0.6%	(0.6%)	0.2%
Plains All American	PAA	17.9%	20.0%	22.4%	18.9%	20.5%	18.9%	13.1%	13.4%	11.0%
Targa Resources	TRGP	9.0%	12.9%	15.2%	10.5%	10.9%	6.8%	9.6%	9.0%	4.3%
TC Energy	TRP	13.2%	12.1%	13.0%	1.7%	(0.0%)	0.6%	(4.3%)	(6.2%)	(5.8%)
Western Midstream	WES	12.7%	11.2%	14.2%	12.4%	10.8%	13.8%	7.9%	3.7%	6.7%
Williams	WMB	9.3%	10.1%	10.4%	6.4%	5.5%	6.2%	1.6%	0.6%	1.1%
Median		**12.2%**	**12.1%**	**13.0%**	**10.2%**	**7.7%**	**9.6%**	**2.7%**	**1.5%**	**2.0%**

Management Commentary

Williams (WMB) on its natural gas strategy…. "Our natural gas strategy has proven that it can capture upside margins and weather commodity price cycles as we work to serve growing demand for clean, secure and affordable energy. These results really speak to the strength of our assets and our long-term approaches business. Williams is the most natural gas-centric large-scale midstream company around today, and there's a reason we've stuck with our natural gas-focused strategy for as long as we have. Not only is this strategy delivering in the current environment, but the signals coming from the market show that it is going to continue to deliver substantial growth for the long term as well. We expect strong fundamentals to drive attractive growth opportunities for Williams, including higher demand for U.S. LNG exports and a faster pace of coal to gas conversion with the lion's share of these projects residing along the Transco corridor. Natural gas demand across various sectors continues to increase in the face of higher natural gas prices. This speaks to the continued inelastic demand for natural gas, both here and abroad and the fact that domestic natural gas remains a bargain versus alternative fuels. We continue to see strong growth in the quarterly natural gas -- in our quarterly natural gas gathering volumes and our contracted transmission capacity. And we're seeing progress on important projects like our Regional Energy Access project, the Louisiana Energy Gateway and other Transco projects that are currently in execution. And speaking of execution, our attractive high-return growth backlog in the Gulf of Mexico remains intact. With the 6 previously announced Deepwater projects set to increase EBITDA by over $300 million beginning in '25. And we recently began pipelay operations on the well projects here just recently."

Energy Transfer (ET) on NGL demand…. "NGL demand both in the U.S. as well as from overseas customers continues to increase, and we have sufficient commitments to move forward with an ethane export expansion. Even though we expect to expand our ethane export capabilities at both our Marcus Hook and Nederland Terminals, these commitments provide us with the optionality to initially expand at either terminal. Construction of Frac VIII continues to schedule, and we expect it to be in service in the third quarter of 2023, which will bring our total Mont Belvieu fractionation capacity to over 1.1 million barrels per day. Construction of our new 200 million cubic foot per day Grey Wolf processing plant in the Delaware Basin is underway. In addition, given the significant amount of demand we're seeing, we are evaluating the necessity and potential timing of adding another processing plant in the region. Mainline construction of the Gulf Run pipeline was only finished, and we expect to complete the modification of compression by the end of this year. Gulf Run, which is a 42-inch interstate natural gas pipeline with 1.65 Bcf per day of capacity will provide natural gas transportation between our upstream pipeline network and from the Haynesville Shale for delivery to the Gulf Coast, connecting some of the most prolific natural gas-producing regions in the U.S. with the LNG export market."

OptionsHawk Executive Summary & Focus Stocks

Targa (TRGP) and **Plains (PAA)** are two large-cap favorites in this group for 2023. **EnLink (ENLC)** is a name that screens well in the smaller cap group. This group is mostly for those looking for yield and not one to be actively trading as the other Energy groups are more liquid.

Energy – Refiners (Downstream)

Resources: Oil & Gas Journal, Fuel Market News, Rig Zone,

Components: MPC, VLO, PSX, DINO, PBF, CVI, SUN, UGP, DK, PARR, INT, IMO

International & Private Peers: Sinopec, CNPC, Saudi Aramco, Rosneft, Shell, Petrobras, PDVSA, NIORDC, ENROS, Pemex, IOCL, Lukoil

Intro

The Refiners put in very strong performances in 2022 though the set-up is tougher in 2023 from a demand standpoint, but markets remain tight. Crack spreads have softened materially over the past few months. Demand is a meaningful culprit, with US gasoline + diesel + jet demand trending down an aggregate ~1.5MMbpd YoY in the latest weekly reading. Refinery outages are also moderating post-turnaround season and refinery strikes in Europe reversing, driving some supply response.

Downturn-driven capacity attrition, risk premium related to Russian exports, high natural gas prices in Europe, IMO 2020 effects, and China's more-muted exports YTD have all kept diesel/jet pricing high. Cracks seem likely to remain high so long as middle distillates remain in short supply. Yet, recession remains an obvious risk – refiners have not proven historically to be great stocks to own into economic downturns.

Industry Backdrop & Investment Considerations

The industry is seeing a seismic shift with China set to surpass the US as the World's top refiner with its demand for plastics and fuel rising with a strong recovery while the US and Europe remain weak and also transition away from fossil fuels over the long run. One of the key drivers of new projects is growing demand for the petrochemicals used to make plastics.

Biofuels — and particularly renewable diesel — are a key focal point for growth capex these days. While the term "biofuel" can refer to a variety of products, the most commonly discussed are ethanol, biodiesel, renewable diesel, and sustainable aviation fuels. Ethanol is quite mature — the US produces ~1MMbpd annually ,and this is blended into the gasoline pool. Biodiesel and renewable diesel are both, as their name implies, substitutes for diesel, but renewable diesel is chemically identical to petroleum-based diesel, and therefore is a valuable product as it can be used in virtually all applications diesel is used. Sustainable aviation fuel (SAF) is in its infancy — many companies are exploring creating production capacity, but most believe it to be uneconomical based on current market pricing and incentive programs. VLO is the market leader right now, both in terms of installed renewable capacity and future growth plans, but HFC, MPC and PSX all have meaningful growth plans that could potentially drive renewables to >10% of EBITDA by2024.

Refiners have tended to historically perform better in the October-April period while being challenged in the Summer months.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, Debt to EBITDA, FCF Yield

Asset Quality, Capital Returns

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Refiners - Downstream							#VALUE!		
MPC	Marathon Petroleum Corp	50.1B	3.09X	-13%	(11.975%)	14.8%	26.15%	(26.946%)	2.75X
PSX	Phillips 66	46.3B	4.14X	-9%	(12.37%)	10.5%	20.82%	2.98%	1.96X
VLO	Valero Energy Corporation	44.2B	3.11X	-13%	(18.668%)	9.95%	24.05%	(1.543%)	2.43X
IMO	Imperial Oil Ltd (USA)	30.4B	3.72X	18%	(16.265%)	19.94%	16.51%	7.41%	0.71X
DINO	HF Sinclair Corp	9.8B	2.50X	-27%	(15.809%)	13.65%	31.91%	2.48%	2.56X
SUN	Sunoco LP	4.3B	8.72X	6%	0.38%	4.19%	8.63%	4.34%	4.14X
PBF	PBF Energy Inc	4.0B	0.99X	-25%	(7.716%)	12.06%	81.61%	(6.208%)	7.01X
CVI	CVR Energy, Inc.	2.9B	3.24X	-41%	(38.203%)	11.6%	#VALUE!	(33.529%)	3.61X
UGP	Ultrapar Participacoes SA (ADR)	2.7B	30.17X	8%	6.26%	1.79%	#VALUE!	1.77%	3.88X
DK	Delek US Holdings Inc	1.8B	3.17X	-56%	(21.672%)	2.55%	3.45%	(9.35%)	11.30X
INT	World Fuel Services Corp	1.6B	5.40X	-23%	8.72%	0.78%	#VALUE!	3.16%	-0.58X
PARR	Par Pacific Holdings Inc	1.2B	2.07X	-51%	(23.951%)	10.41%	44.10%	(12.354%)	9.04X

Management Commentary

Marathon Petro (MPC) on the Refining industry fundamentals…. "Roughly 4 million barrels per day of refining capacity has come offline globally in the last couple of years. Yet demand for the transportation fuels we manufacture remains robust and continues to grow. In the U.S., demand is still below 2019 pre-COVID levels, and we believe there will be a continued recovery. As supply remains constrained and demand continues to rebound, we maintain a bullish outlook towards the refining environment as we look into 2023. We normally see seasonal decline at this time of the year but to date, we're not seeing those signs. Strong forward crack spreads and wide salary differentials for 2023 indicate the expectation of a strong refining environment going forward. We're still not at 2019 levels of demand across all the products, gasoline, diesel, jet fuel. So we're still below, but we are slowly recovering. So you have supply constrained, you got demand recovering -- and to your point, the mid-cycle that we see into the future is clearly above the previous mid-cycle because the global fundamentals have changed. And as we look out in time, there are going to be some capacity additions occurring throughout the world but we also believe that demand is going to continue to pace such that the new mid-cycle for what we're going to see is significantly above where we've been in the past. So that's obviously why we have a bullish overtone here and why we still believe that the assets that we have are still trading under intrinsic value."

Valero (VLO) on refining margins…. "Refining margins remain supported by strong product demand, low product inventories and continued energy cost advantages for U.S. refineries compared to global competitors. Despite high refinery utilization rates, global product supply remains constrained due to roughly 4 million barrels per day of global refining capacity being taken permanently off-line since 2020 for a variety of reasons, including unfavorable economics or as part of planned conversions to produce low carbon fuels. Product demand across our system remains strong, with gasoline and diesel demand higher than pre-pandemic levels, and jet fuel demand steadily approaching 2019 levels. Our refining utilization increased to 95% in the third quarter as we continue to maximize refining throughput. Our refining system also benefited from wider sour crude oil differentials to the Brent light sweet crude oil benchmark. The wider sour crude oil differentials are attributed to increased sour crude oil supply, the impact of the IMO 2020 regulation for lower sulfur marine fuels and high natural gas prices in Europe that incentivize European refiners to process sweet crude oils in lieu of sour crude oils. And we remain on track with our refining growth projects that reduce cost and improve margin capture. Looking ahead, refining fundamentals remain strong as global product supply remains constrained due to capacity reductions and high natural gas prices in Europe, which are setting a higher floor on margins. In addition, we continue to realize the benefit from discounted sour crude oil and fuel oil feedstocks in our system."

OptionsHawk Executive Summary & Focus Stocks

Looking at the five large caps the setup is similar with this being a peak-earnings year, but these names all have very strong FCF and trading at very cheap valuations. **Marathon's (MPC)** superior capital returns make it a preferred name for this part of the cycle. I would avoid the smaller cap names with levered balance sheets and the second best name of this group is **HF Sinclair (DINO).**

Energy – Renewable Energy

Components: ENPH, FSLR, SEDG, BEP, NEP, RUN, SHLS, EVA, DQ, SPWR, ARRY, FLNC, JKS, MNTK, HASI, ITRI, NOVA, CSIQ, RNW, CLNE, SLDP, MAXN, NRGV, GEVO, TPIC

International & Private Peers: LONGi Solar, Hanwha Q-Cells, Vestas Wind, Siemens Gamesa, CropEnergies, Motech

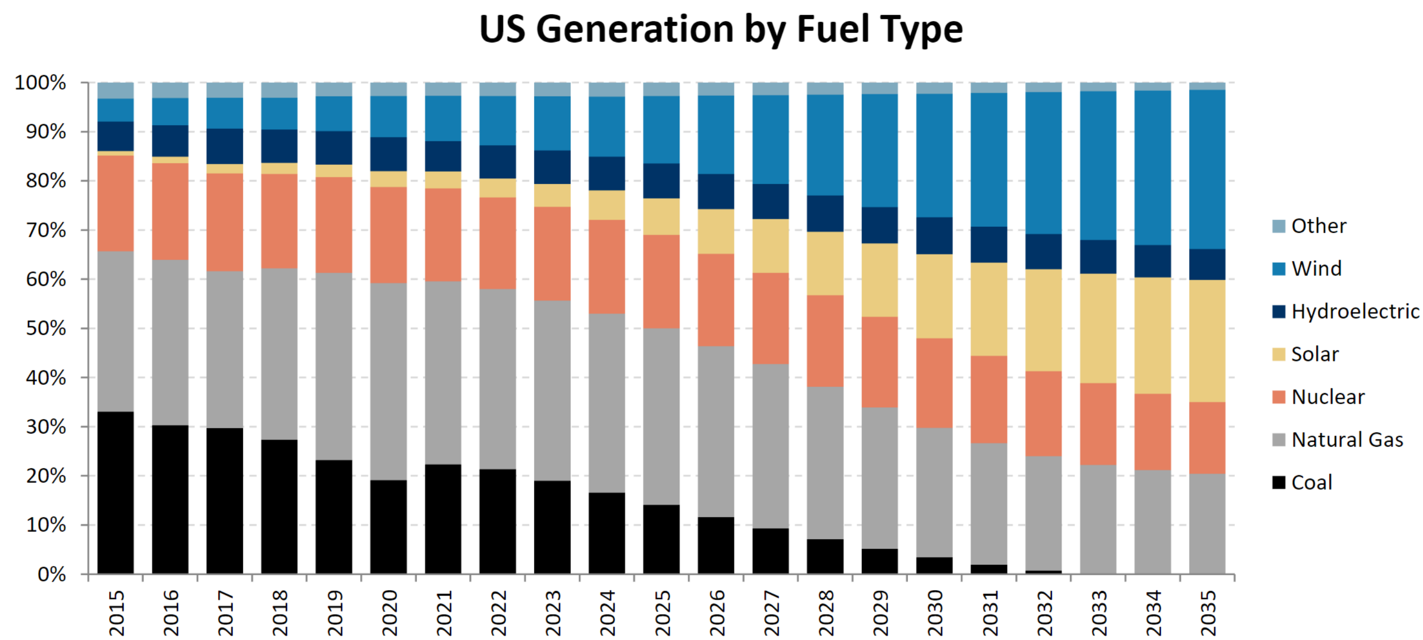
Intro

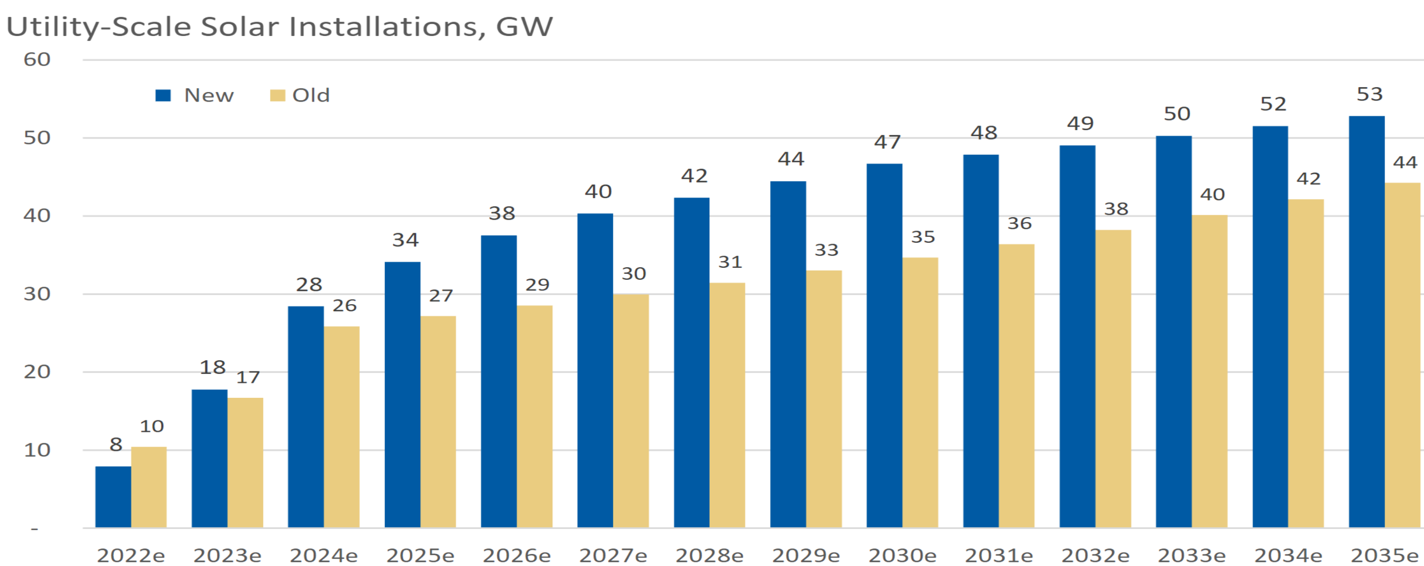
Solar stocks saw some massive gains in 2022 led by ENPH and FSLR as the demand environment continues to strengthen and supply chain issues are starting to improve. It is one of the few groups seeing consistent upside revisions to estimates and is in a multi-year investment cycle.

Industry Backdrop & Investment Considerations

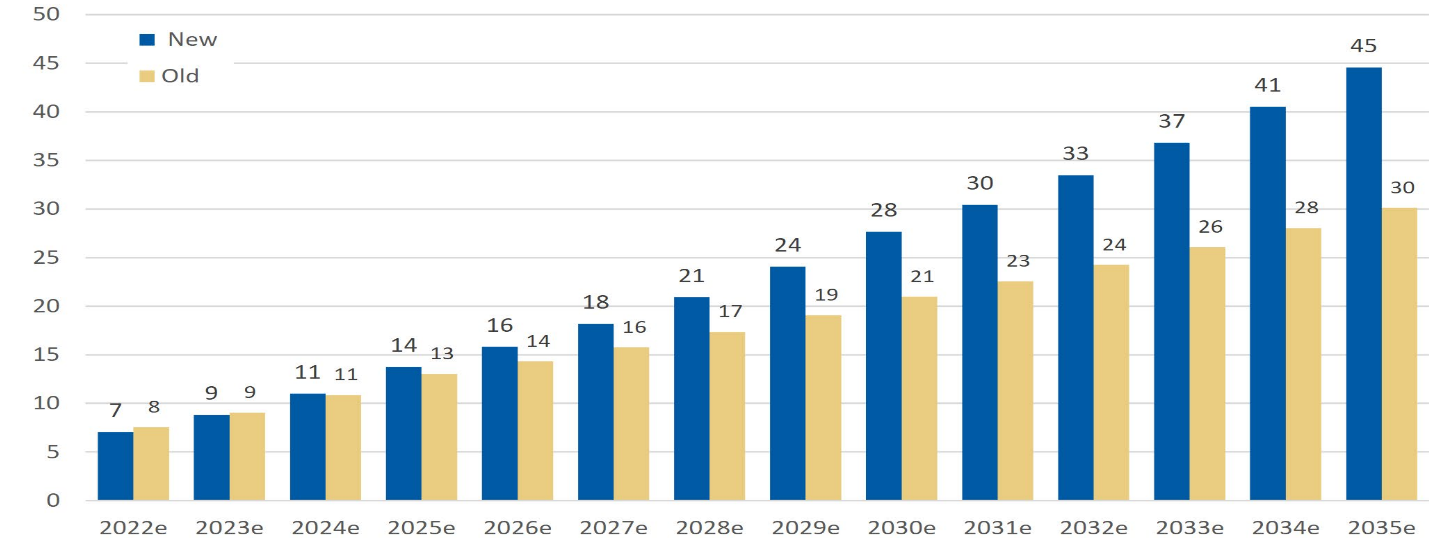
The renewables outlook remains favorable for further penetration of electricity generation while the IRA is supportive of a multi-year investment cycle.

The IRA provides significant, wide-ranging support for decarbonization technologies and domestic manufacturing. From the perspective of clean energy equities, the most important support provisions include: (1) enhanced and extended tax credits for wind, solar, and fuel cells; (2) a new standalone tax credit for energy storage; (3) enhanced tax credit for carbon capture and sequestration; (4) significant tax credit for a range of biofuels/sustainable aviation fuel; (5) a large tax credit for green and blue hydrogen; (6) a tax credit for nuclear power; (7) significant subsidies for domestic manufacturing of solar (including trackers), wind, offshore wind, and batteries (and associated battery raw materials); (8) tax loss "transferability" and "direct pay" (which reduces the cost of monetizing tax losses/credits); (9) significant tax credits for EVs; and (10) enhanced tax credits for domestic content, deployment in disadvantaged communities, and wage/apprenticeship requirements, among others.

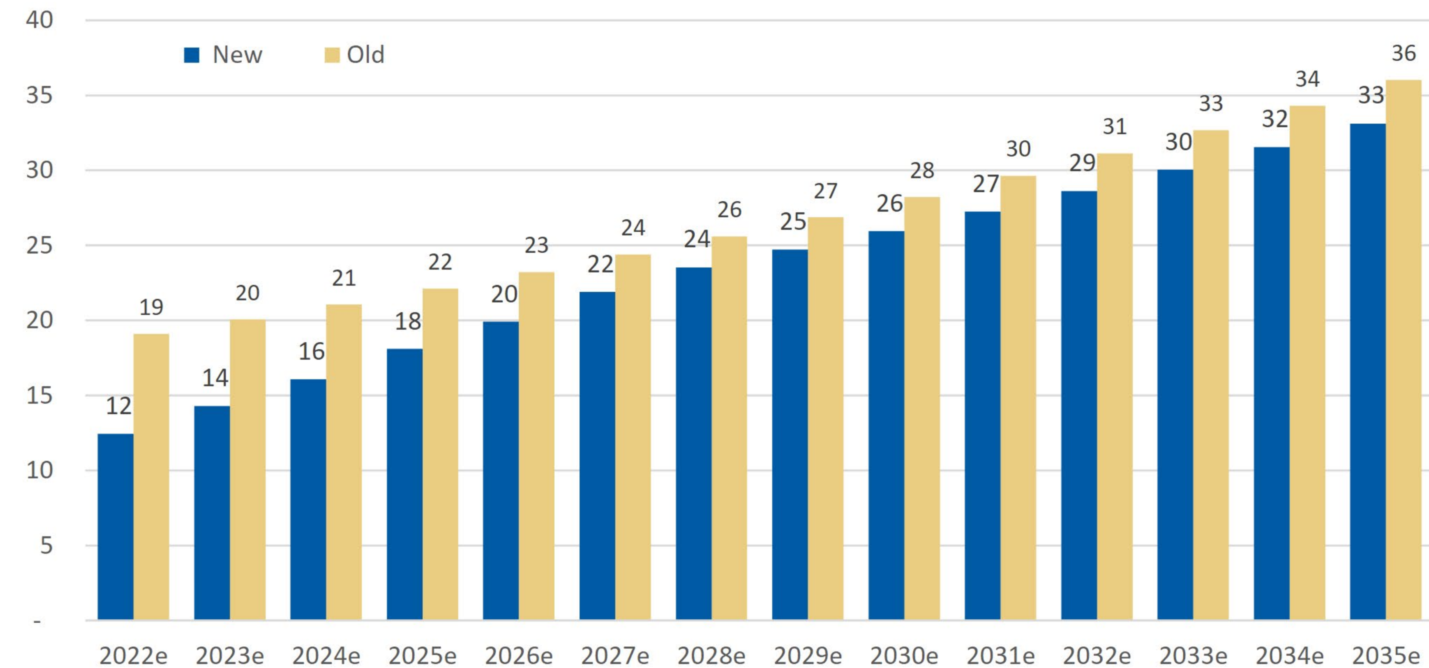


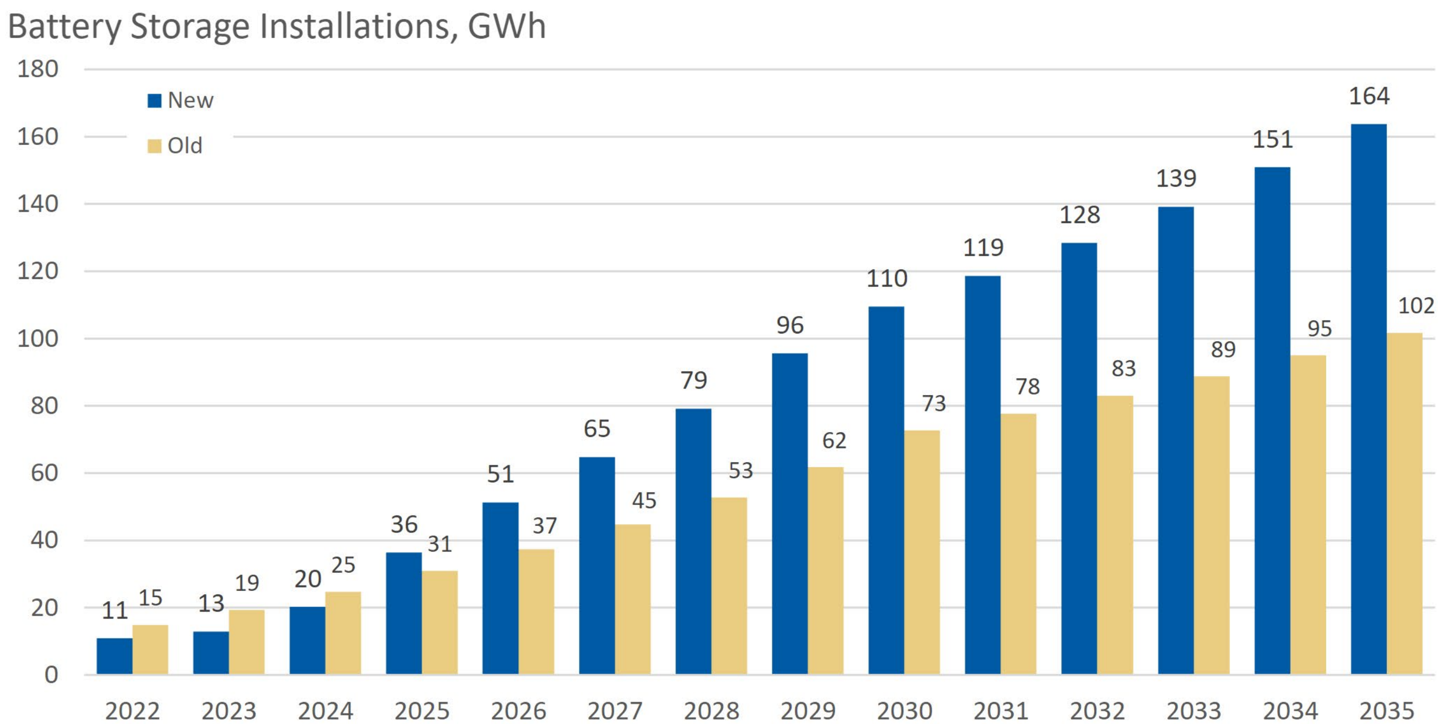


Distributed Solar Installations, GW



Onshore Wind Installations, GW





Indicators, Metrics & Stock Selection Framework

Revenue Growth, EV/EBITDA, EBITDA Margins, DSO

Valuation & Comps

EV/EBITDA to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/ EBITDA
Renewables							#VALUE!		
ENPH	Enphase Energy Inc	43.4B	63.08X	79%	21.85%	32.87%	1.66%	45.87%	-0.44X
SEDG	Solaredge Technologies Inc	17.6B	36.78X	11%	25.12%	15.94%	-0.01%	24.16%	-1.49X
FSLR	First Solar, Inc.	16.1B	67.28X	44%	83.09%	(0.148%)	-6.96%	10.2%	-1.80X
BEP	Brookfield Renewable Partners L.P.	11.0B	26.25X	-10%	11.7%	44.8%	3.07%	(2.64%)	10.48X
NEP	Nextera Energy Partners LP	6.4B	12.31X	11%	12.93%	124.83%	-13.67%	(0.885%)	3.11X
RUN	Sunrun Inc	6.1B	-85.42X	211%	354.17%	(2.789%)	-19.61%	(0.705%)	-18.35X
SHLS	Shoals Technologies Group Inc	4.4B	54.43X	3%	48.15%	29.26%	1.50%	17.55%	4.70X
SPWR	SunPower Corporation	3.8B	38.45X	-13%	29.79%	6.85%	#VALUE!	3.81%	3.04X
EVA	Enviva Inc	3.8B	21.65X	-17%	27.69%	18.61%	#VALUE!	(15.408%)	11.20X
DQ	Daqo New Energy Corp (ADR)	3.7B	0.55X	244%	(1.141%)	59.03%	#VALUE!	65.27%	-0.37X
ARRY	Array Technologies Inc	3.1B	32.80X	-44%	13.25%	10.76%	3.22%	6.48%	7.72X
HASI	Hannon Armstrong Sustnbl Infrstr Cap Inc	2.8B	37.02X	19%	22.72%	49.18%	#VALUE!	1.26%	12.68X
FLNC	Fluence Energy Inc	2.7B	-11.75X			(20.248%)	#VALUE!	67.82%	0.24X
JKS	JinkoSolar Holding Co., Ltd (ADR)	2.5B	183.93X	8%	15.85%		#VALUE!	3.86%	8.34X
RNW	Renew Energy Global PLC	2.4B	718.52X	11%	18.58%	93.34%	#VALUE!	(3.782%)	6.34X
ITRI	Itron Inc	2.4B	33.50X	-35%	73.8%	5.78%	#VALUE!	5.32%	4.35X
NOVA	Sunnova Energy International Inc	2.3B	58.07X	33%	47.6%	27.65%	-83.36%	(3.951%)	28.24X
CSIQ	Canadian Solar Inc	2.1B	7.93X	7%	23.5%	7.49%	#VALUE!	3.82%	2.52X
MNTK	Montauk Renewables Inc	1.6B	20.01X	-11%	27.33%	37.38%	#VALUE!	(2.199%)	1.26X
CLNE	Clean Energy Fuels Corp	1.2B	19.64X	-18%	84.37%	19.16%	-15.64%	1.42%	-2.10X
MAXN	Maxeon Solar Technologies Ltd	0.9B	-8.36X	35%	168.1%	(12.525%)	#VALUE!	(72.216%)	0.08X
SLDP	Solid Power Inc	0.5B	-2.29X	77%	(8.815%)	(495.699%)	-4408.89%	71.54%	12.16X
GEVO	Gevo Inc	0.4B	-2.06X	69%		(13628.803%)	#VALUE!	(17.835%)	3.36X
NRGV	Energy Vault Holdings Inc	0.4B	-17.33X	64%		(1015.998%)	#VALUE!	(244.925%)	2.14X
TPIC	TPI Composites Inc	0.4B	14.20X	-83%	86.28%	3.56%	-21.49%	(63.312%)	-16.94X

Management Commentary

Enphase (ENPH) on EV charging…. "We shipped more than 6,370 chargers in Q3 compared to 8,250 in Q2. We are on track to manufacture Enphase branded EV chargers that our contract manufacturing facility in Mexico by the end of this year, helping us to increase capacity and cut down costs. As for new products, we expect to introduce smart EV chargers to U.S. customers in the first half of '23, followed by Europe. We are excited about this product as it will provide connectivity and control, enabling use cases like green charging and allowing homeowners visibility into operation of their Enphase solar plus storage plus EV system through the Enphase app. We are very bullish about our EV charging business and continue to invest in it significantly."

First Solar (FSLR) discussing IRA accelerating demand…. "In addition to previously noted demand drivers, including customers' need for certainty around technology, supplier integrity and our ability to stand behind our contracts and deliver on our commitment, demand has been further catalyzed by the enactment of the Inflation Reduction Act. For many customers, this legislation has provided visibility into supportive long-term policy environment through the extension of the solar investment tax credit, the introduction of the production tax credit for solar and similar incentives with respect to green hydrogen. As a consequence, we are seeing increased demand from both existing and potential new customers and included in our pipeline are several opportunities with multiyear, multi-gigawatt volumes."

Brookfield Renewable (BEP) on its Nuclear investment…. "Our investment in Westinghouse is an attractive entry point into nuclear power generation, which we believe along with hydro to be one of the key technologies facilitating the rapid buildout of intermittent renewables. Wind and solar must be complemented by clean, dispatchable baseload power generation. As the owner of one of the largest hydro businesses globally, we have visibility to the increasing value of clean, reliable and economic sources of power to the grid. Westinghouse is exceedingly well positioned to benefit from these secular trends. It is the leading, original equipment manufacturer and scale provider of mission-critical technologies, products and services to half the global nuclear power generation fleet. Westinghouse serves as a key enabler of the energy transition around the world, providing products and services essential to both the continued operation and growth of the global nuclear fleet. Given the need for clean dispatchable energy, as well as its compelling economic proposition, we believe that nuclear power is posed for significant growth and as long as nuclear power exist, Westinghouse will perform well. Westinghouse is well positioned to benefit from the significant volume of plant extensions that have been announced, 50 gigawatts and growing and the more than 60 gigawatts of new build reactor is expected between 2020 and 2040 across more than 20 countries around the world."

OptionsHawk Executive Summary & Focus Stocks

Looking at the four large cap names the valuations are wildly high, but valuations only tend to matter once the growth slows, which does not appear to be the case just yet. **Enphase (ENPH)** is the clear best-in-class name while **First Solar (FSLR)** has an outlook for robust bookings and has seen massive opening put sales as a continuous trend going out to January 2024. In the $3B to $6B market cap tier **Shoals (SHLS)** is posting impressive numbers and has one of the strongest growth outlooks while also having strong profitability. There are a lot of sub $3B market cap names, and of those, **Sunnova Energy (NOVA)** screens attractive on growth and margins but the balance sheet is a concern. **Montauk (MNTK)** is a RNG play that could be a M&A target as the industry is seeing a lot of deals.

Energy – EV Infrastructure & Battery Technologies

Components: PLUG, CHPT, QS, BE, ENVX, JOBY, ENS, STEM, EVGO, BLDP, AMPS, FREY, EVTL, FCEL, WBX, LICY, BLNK, ACHR, MVST, GWH, LILM, HYLN, HYZN, REE

International & Private Peers: Volta, FreeWire, EasyMile, Einride, Ather Energy, Webasto, RWE, EVBox, G2-Mobility, LG Chem, CATL, Panasonic, BYD, SDI, A123 Systems, Saft Batteries, GS Yuassa

Intro

This group was crushed in 2022 due to the long-duration style with not much profitability seen anytime soon across these names. There is also a ton of competition, so a lot of these are speculative bets on which company's technology wins the race.

Industry Backdrop & Investment Considerations

The electric vehicle (EV) TAM for 2040 and the Energy Storage Systems (ESS) TAM for 2040 is estimated at $525B with the latter just 3% of the total market.

EV penetration is expected to grow to 30% of auto sales by 2030 and although the number may be aggressive, the trend itself is certainly heading to higher penetration rates into the future. The need for public charging infrastructure is seen growing at a 37% CAGR with opportunities for companies to capitalize and monetize across the value chain.

The recharging market is seen reaching a $27B TAM by 2040 along with additional revenues through recurring network fees reaching $3B by 2030. Companies can be characterized as either hardware providers (revenue comes from unit sale), asset owners and operators (capital intensive, drivers are monetized), or network providers (higher margin service solutions).

There is a serious need for EV Infrastructure and enhanced battery technologies though many larger Auto, Energy, Utility and Chemical companies also have ambitions in this space causing a highly competitive industry.

Estimates are for vehicle battery demand to grow from 155 GWh in 2020 to 2,294 GWh in 2030 and 5,508 GWh in 2040. Battery makers are expected to pursue a number of new technologies over the next few years, including high-nickel and silicon anode. Next-generation batteries are in focusing with all-solid-state batteries (ASSBs) as a promising option for automotive applications. The primary potential advantages of lithium-metal solid-state batteries include higher density (because there is more space to store lithium), longer lifetime (by limiting the side reactions that reduce battery storage capacity), faster charging (as higher voltages can be applied with less risk of lithium plating which can occur on the anode in a conventional lithium-ion battery), and improved safety (given the lack of a liquid electrolyte, which is flammable).

Indicators, Metrics & Stock Selection Framework

EV/Revenues, EV/EBITDA, Revenue CAGR, Gross Margins, EBITDA Margins

Valuing fuel-cell hydrogen companies is challenging, given that most of the future growth that underpins valuations is speculative and based on projections, which may or may not come to fruition. Fuel-cell companies trade more on thematics, momentum, and fund flows, and are less rooted in fundamentals.

Valuation & Comps

2025 EV/Sales vs. 2025-2030 Revenue CAGR

Management Commentary

Plug Power (PLUG) on hydrogen ecosystem…. "Plug is a leader and will continue to be a leader in the energy transition. We have first-mover advantage in the fuel cell and hydrogen industry that we do not intend to seed. We will have first green hydrogen network acr"oss the United States by 2025. And when we look out to 2030, we'll have the most commercial vehicles on the road through our Renault JV, HYVIA. We'll have the largest deployments of PEM electrolyzers. We'll be selling fuel cell peaker plants at scale using our hydrogen and many, many more activities will be engaged with."

EnerSys (ENS) on IRA impact and its diverse offerings… "Our strategy to invest in a diverse set of technology offerings and expand into Energy Systems end markets is paying off as secular trends and U.S. government mandates and funding are driving markets to us. While clarification from the U.S. government following the open comment period that closed last week is still needed. Based on our initial assessment of the Inflation Reduction Act, EnerSys could benefit from substantial direct tax as well as market growth incentives for our transportation, Motive Power and EV charging businesses. Our fast charge and storage initiative continues to build momentum. We are installing a significant upgrade to our current on-site demo with a near production-grade system, offering the highest energy density currently in its class with full artificial intelligence capabilities for optimized energy management and advanced cloud services. We are very pleased with our development on this project."

OptionsHawk Executive Summary & Focus Stocks

This is a tough group to evaluate, and we really want to be patient and see which companies are delivering the strongest growth while controlling expenses and reaching profitability faster. **EnerSys (ENS)** is a name in this group that is profitable and trades 11X EBITDA with just 9.5% margins but a solid outlook for growth. **Altus (AMPS)** is an interesting speculative name that is coming off an impressive quarter while having key strategic partnerships. **Bloom Energy (BE)** also looks to be a better play in the industry with FCF/EBITDA inflecting positively.

Consumer Goods

The Auto & Truck industry accounts for many of the stocks in this group where the surging demand for electric vehicles (EV) and its impact across the vehicle supply chain remains the main thematic growth story. The Food & Beverage industry saw at-home consumption trends weaken though remain elevated while the return of the restaurant industry and events was positive particularly across the Beverage group. The Apparel & Footwear group are seeing slowdowns from a weaker consumer spending environment and followed a period of inventory build. The Millennial peak spending year's theme remains in place for consumption trends across this sector.

Auto & Truck – OEM Automakers

Resources: BAML Automotive Weekly Pitstop

Components: TSLA, TM, GM, F, STLA, HMC, RACE, RIVN, LCID, TTM, NIO, LI, PSNY, XPEV, FSR, PTRA, LEV, ARVL, GOEV

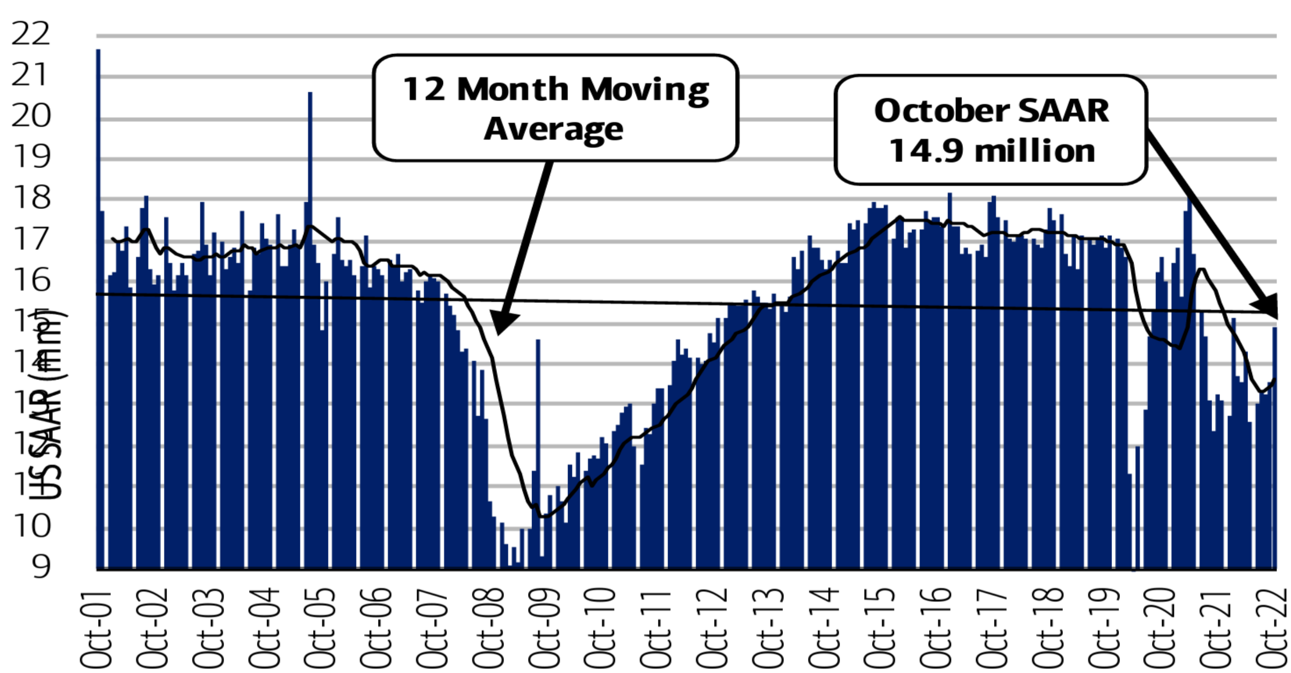
International & Private Peers: Volkswagen, Volvo, BMW, Hyundai/Kia, Suzuki, Nissan, Renault, Mazda, Aston Martin

Intro

The Auto stocks struggled in 2022 with the entire group down on the year with consumer demand weakening, supply chain challenges and rising costs. We are seeing a sharp pivot from under-supply to over-supply of light vehicles. The result is pricing coming down from nosebleed territory and this is likely to put margins at risk in 2023.

The continued penetration gains of EV remains a key theme into 2023 while a lot of the production issues from supply chain bottlenecks are easing. Supply chains are still constrained, and broad-based commentary indicates recovery is increasingly a 2023+ event. Companies are also seen benefitting from easing raw material prices. The industry may struggle to increase volume in 2023, and a real recovery is a 2024+ event. Competition continues to surge in the EV space with a lot of new entrants and joint ventures and some of the weaker names continue to burn cash at an unsustainable rate. Expectations for production for the next few years, both globally and regionally have deteriorated mainly due to Europe. S&P Global/CSM forecasts 2023-2025 global production to increase a 3.2% CAGR. Total automotive inventory at the end of October 2022 increased 111k units from the end of September 2022, to 1.54mm units, the highest level since April 2021. Average transaction prices (ATPs) continued to climb this month, up 2.9% YoY to $44,625 (+$1,273/unit YoY), according to TrueCar.

October SAAR of 14.9m was above the 12-month moving average



Source: WardsAuto InfoBank

Industry Backdrop & Investment Considerations

The auto market remains fragmented and highly competitive globally. VW and Toyota each have about 12% market share globally per IHS data, while GM and Ford represent 7% and 6%. In the US, Ford and GM represent almost one-third of all units solid. Automotive manufacturers can compete through cost leadership, superior product, or product differentiation. SUVs and light trucks make up the majority of the light vehicle market, accounting for about 72% of the market in the USA and 58% globally. The SUV and truck market is an important profit driver for both Ford and GM. These businesses typically have double digit EBIT margins and often subsidize loss making businesses in other regions or product categories.

Correlations to US Consumer Confidence, US Miles Driven. Take into account gasoline prices, raw material cost per vehicle.

EV Penetration - electric vehicles (EVs) are an area of secular growth given the benefits including total cost of ownership (TCO) in the long-term, emissions, and performance. Estimates are that the percentage of US car sales that are EVs will increase to 8.5% in 2025, 20% in 2030, and 60% by 2040. US EV sales grew a solid 66% YoY in October (+28k units) and are up 63% YTD in 2022, suggesting EV demand is robust. ATPs for EVs were up 9.7% YoY in September (to ~$65,300), according to Kelley Blue Book. This compares with the 5.7% YoY increase in ATPs for the overall industry.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EV/Sales, P/E, FCF Yield, Debt to EBITDA, CROCI, ROE, EBITDA Margins, EBITDA Growth

Capital allocation (both dividends and buybacks) have been one area that historically was a positive for valuation.

Valuation & Comps

Company	Currency	Price at	MS	Upside to	MS	Market Cap		MS EPS		Consensus EPS		P / E		EV / EBITDA [3]		EV / Sales [3]		P / B	
		11-Nov	Price Target	PT (%)	Rating	LC	US$	2022e	2023e	2022e	2023e	2022e	2023e	2022e	2023e	2022e	2023e	2022e	2023e
Europe																			
Volkswagen	EUR	138.96	NA	NA	NA	81.4	83.1	NA	NA	33.11	30.91	4.2x	4.5x	5.3x	5.4x	0.9x	0.9x	0.5x	0.5x
Mercedes-Benz	EUR	62.91	70.00	11%	EW	66.5	67.8	13.55	10.19	12.52	11.42	4.6x	6.2x	2.0x	3.2x	0.4x	0.5x	0.8x	0.8x
Daimler Truck Holding	EUR	28.66	35.00	22%	OW	23.2	23.6	3.23	3.06	3.09	3.26	8.9x	9.4x	6.0x	5.9x	0.6x	0.6x	1.3x	1.2x
Renault	EUR	31.14	38.00	22%	OW	9.0	9.2	7.05	9.10	4.07	8.12	4.4x	3.4x	NA	NA	NA	NA	0.2x	0.2x
Stellantis	EUR	14.16	18.50	31%	OW	45.5	46.4	4.74	3.96	5.18	4.41	3.0x	3.6x	NA	NA	NA	NA	0.7x	0.6x
BMW	EUR	82.66	90.00	9%	UW	48.9	49.9	16.36	13.30	22.24	13.65	5.1x	6.2x	0.9x	0.8x	0.1x	0.1x	0.6x	0.6x
Europe Weighted Average												4.7x	5.4x	3.4x	3.8x	0.5x	0.6x	0.7x	0.6x
North America																			
Ford Motor	USD	14.18	15.00	6%	OW	57.0	57.0	1.95	1.30	1.99	1.71	7.3x	10.9x	2.3x	2.6x	0.3x	0.3x	1.3x	1.3x
General Motors	USD	39.74	32.00	(19%)	EW	56.5	56.5	7.25	4.20	7.19	5.96	5.5x	9.5x	2.3x	2.8x	0.3x	0.3x	0.9x	0.7x
North America Weighted Average												6.4x	10.2x	2.3x	2.7x	0.3x	0.3x	1.1x	1.0x
China																			
BYD	HKD	193.40	220.00	14%	EW	212.4	27.1	4.71	6.02	4.39	6.62	41.0x	32.1x	20.1x	15.7x	1.7x	1.3x	4.7x	4.1x
SAIC Motor	CNY	14.51	22.00	52%	OW	168.2	23.4	2.17	2.50	1.80	2.07	6.7x	5.8x	4.4x	3.2x	0.1x	0.1x	0.6x	0.5x
Geely	HKD	10.30	22.00	114%	OW	103.6	13.2	0.51	0.95	0.54	0.81	20.2x	10.8x	5.7x	3.1x	0.5x	0.3x	1.3x	1.2x
Anhui Jianghuai	CNY	13.82	12.00	(13%)	UW	29.9	4.2	0.27	0.50	0.09	0.20	50.8x	NM	6.4x	4.5x	0.5x	0.4x	1.7x	1.6x
Sinotruk	HKD	8.69	12.40	43%	EW	24.0	3.1	1.22	1.47	1.15	1.58	7.1x	NA	NM	NM	NM	NM	0.6x	0.6x
Dongfeng	HKD	4.02	6.50	62%	OW	34.6	4.4	1.27	1.29	1.31	1.38	3.2x	NA	1.5x	1.5x	0.3x	0.3x	0.2x	0.2x
Chongqing Changan	HKD	3.73	6.05	62%	OW	6.1	0.8	0.68	0.59	0.78	0.75	5.5x	6.3x	5.4x	4.6x	0.4x	0.4x	0.6x	0.5x
Zhengzhou Yutong Bus (	CNY	7.34	14.00	91%	EW	16.1	2.2	0.99	1.24	0.19	0.41	7.4x	5.9x	2.0x	1.4x	0.2x	0.2x	0.9x	0.9x
BAIC Motor	HKD	1.92	1.80	(6%)	UW	15.4	2.0	0.31	0.32	0.51	0.56	6.2x	6.0x	NM	NM	NM	NM	0.3x	0.3x
Chongqing Changan	HKD	3.73	6.05	62%	OW	6.1	0.8	0.68	0.59	0.78	0.75	5.5x	6.3x	5.4x	4.6x	0.4x	0.4x	0.6x	0.5x
Guangzhou	HKD	5.34	10.50	97%	OW	16.5	2.1	1.42	1.56	0.97	1.09	3.8x	3.4x	29.0x	20.0x	0.9x	0.7x	0.5x	0.5x
Great Wall	HKD	9.06	16.00	77%	OW	27.1	3.5	0.92	1.03	1.08	1.16	9.9x	8.8x	18.6x	14.0x	1.2x	1.0x	1.1x	1.0x
China Weighted Average												21.5x	16.3x	10.9x	8.2x	0.8x	0.6x	2.0x	1.8x
South Korea																			
Hyundai Motor	KRW	172,000.00	180,000.00	5%	EW	36,179.7	26.8	39,051.31	35,955.18	30,940.09	31,791.34	4.4x	4.8x	8.9x	8.5x	0.9x	0.8x	0.4x	0.4x
Kia Motors	KRW	68,000.00	80,000.00	18%	OW	27,136.3	20.1	13,364.80	15,115.10	13,588.22	15,536.30	5.1x	4.5x	2.3x	1.9x	0.3x	0.2x	0.7x	0.6x
South Korea Weighted Average												4.7x	4.7x	6.1x	5.7x	0.6x	0.5x	0.6x	0.5x
Japan																			
Toyota Motor	JPY	2,001.00	2,350.00	17%	OW	31,422.4	222.9	208.69	234.45	202.63	225.88	9.6x	8.5x	6.6x	5.5x	0.8x	0.7x	1.0x	0.9x
Mazda Motor	JPY	1,091.00	1,100.00	1%	OW	689.3	4.9	202.04	221.63	187.96	195.80	5.4x	4.9x	1.6x	1.1x	0.1x	0.1x	0.5x	0.4x
Nissan Motor	JPY	499.50	500.00	0%	UW	2,029.2	14.4	57.75	71.38	60.22	86.64	8.6x	7.0x	3.5x	2.7x	0.2x	0.2x	0.4x	0.4x
Subaru Corp	JPY	2,400.00	2,000.00	(17%)	UW	323.8	2.3	254.22	284.53	506.00	538.00	9.4x	8.4x	13.0x	10.8x	0.4x	0.3x	0.9x	0.8x
Honda Motor	JPY	3,335.00	3,400.00	2%	EW	5,814.6	41.3	424.10	484.18	443.87	504.59	7.9x	6.9x	3.0x	2.4x	0.2x	0.2x	0.5x	0.5x
Japan Weighted Average												9.2x	8.2x	5.9x	4.9x	0.6x	0.6x	0.9x	0.8x
India [2]																			
Maruti Suzuki	INR	9,086.1	10,919.0	20%	OW	2,724.3	33.8	240.4	375.3	248.1	356.6	37.8x	24.2x	21.8x	14.3x	1.9x	1.6x	4.7x	4.3x
Bajaj Auto	INR	3,722.6	4,309.0	16%	OW	1,044.8	13.0	207.2	227.0	198.2	227.0	18.0x	16.4x	13.9x	12.5x	2.3x	2.1x	3.8x	3.5x
Hero MotoCorp	INR	2,714.3	2,281.0	(16%)	UW	537.3	6.7	145.9	180.4	148.3	186.1	18.6x	15.0x	10.4x	8.3x	1.2x	1.0x	3.2x	2.9x
TVS Motor	INR	1,107.1	1,106.0	(0%)	EW	520.9	6.5	31.1	36.0	31.4	40.6	35.6x	30.7x	18.8x	16.2x	2.1x	1.9x	9.0x	7.5x
Tata Motors	INR	412.2	502.0	22%	OW	1,357.2	16.8	(6.2)	37.1	12.8	33.3	32.1x	12.4x	6.3x	4.0x	0.8x	0.6x	3.4x	2.6x
Ashok Leyland	INR	146.7	175.0	19%	OW	426.7	5.3	2.2	6.2	3.6	7.2	65.8x	23.7x	24.1x	12.3x	1.4x	1.1x	5.4x	4.4x
India Weighted Average												33.6x	20.3x	16.4x	11.4x	1.7x	1.4x	4.6x	4.0x
Global Weighted Average												**11.0x**	**9.2x**	**6.5x**	**5.5x**	**0.7x**	**0.6x**	**1.3x**	**1.2x**

Management Commentary

Tesla (TSLA) on demand and low penetration…. “We've got a lot of questions about demand in recent weeks. I can't emphasize enough, we have excellent demand for Q4, and we expect to sell every car that we make for as far in the future as we can see. So the factories are running at full speed, and we're delivering a recovery make and keeping operating margins strong. We are still a very small percentage of the total vehicles on the road. Of the 2 billion trucks on the road, we only have about 3.5 million. So we're about a long way to go to even reach 1% of the global fleet. So we have an incredible product portfolio. I think we've got the most exciting product portfolio of any company on earth, some of which you've heard about, some of which you haven't. We're in the final lap for Cybertruck. We're building a Cybertruck line here at Giga Texas Austin and making a lot of progress in the robotaxi platform design.”

Ford (F) on positive IRA impacts…. “We expect the U.S. Inflation Reduction Act to have a wide range of positive impacts for both our customers and for Ford. What's not yet clear is the degree to which the IRA will drive customer demand versus offsetting our EV investments in growth. So let me touch on some of the potential benefits of the IRA. The first opportunity is our largest, the battery production tax credit of about $45 per kilowatt hour. From '23 to '26, we estimate a combined available tax credit for Ford and our battery partners could total more than $7 billion with large step-up in annual credits in '27 as our JV battery plants ramp up to full production. The second benefit is often overlooked. I haven't actually read any one of the media covering this, but it's super important for Ford. And that's the commercial EV credit. You know that Ford is the #1 commercial vehicle brand in the U.S., and our commercial customers can now claim next year $7,500 per EV vehicle they buy with no restrictions on battery sourcing or manufacturing. Our preliminary estimate is that between 55% and 65% of all of our commercial vehicle customers will qualify. The third opportunity is retail. Ford EVs and our PHEVs remain eligible for the $7,500 tax credit until guidance is issued at the end of this year. Next year, we believe we'll meet the $3,750 critical materials credit requirement on certain Mustang Mach-E and F-150 Lightning models. In '24, the rules will further restrict this critical materials credit. So we believe it's a playing -- a fairly level playing field right now for all the OEMs as our supply chains of critical material extraction and course processing in the U.S. and FTA develops."

OptionsHawk Executive Summary & Focus Stocks

The 2023 environment says to once again avoid the long-duration names that lack FCF which eliminates a lot of the speculative EV names and instead turns the focus to established automakers. **Ferrari's (RACE)** superior margins along with a higher-end customer base make it a preferred name to withstand a down cycle. **Stellantis (STLA)** screens as a potential value name in the group while having superior growth and margins to many peers. **Tesla (TSLA)** is delivering the best growth and margins are better than all peers outside of RACE but valuation remains high and we are already seeing signs of waning demand.

Auto & Truck – Auto Parts

Components: APTV, MGA, LKQ, BWA, LEA, ALV, GNTX, ALSN, FOXF, VC, GT, ADNT, LCII, DORM, DAN, THRM, XPEL, TEN, AXL, MOD, SMP, PLOW, SRI

International & Private Peers: Robert Bosch, Denso, Continental AG, ZF Friedrichshafen, Faurecia, Mahle, Aisin Seiki, Yazaki, Thyssenkrupp, Valeo SA

Intro

The auto parts group saw declines for the most part in 2022 outside of strong returns from MOD, VC, ALSN, and SRI. Raw material normalization, recovery in production/inventory build, and less exposure to loss-making EV projects could set some names apart in 2023.

Supply constraints, namely in chips, has been a major headwind for this group through 2022 but is showing signs of easing while inflationary pressures and China lockdown headwinds could also ease in 2023. However, with production seen muted in 2023 this could be a group to target in 2H23 as a return to growth in 2024 becomes a theme.

Industry Backdrop & Investment Considerations

The global auto parts manufacturing market is valued at approximately $1.1 trillion, with no more than 15 percent reported as coming from a specific auto parts product. Tire manufacturing is the largest single segment of the Auto Parts industry, with $165.6 billion in global revenues, followed by seating and trim manufacturing with $116.3 billion, and drivetrain components manufacturing with $112.1 billion.

The number of vehicles in use, in addition to the number of newly manufactured vehicles, is the main driver of demand in the Auto Parts industry. Periods of economic downturn are characterized by longer vehicle lifespans, and therefore a greater demand for replacement parts. In times of economic expansion, however, more vehicles are being manufactured and sold, which results in a higher demand for auto parts from OEMs.

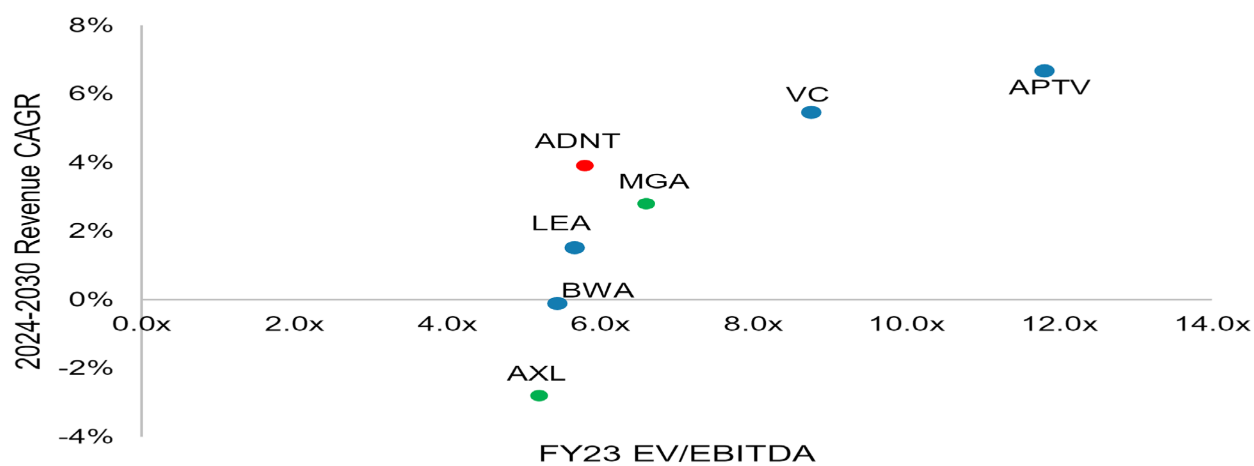
Key themes include increased content per vehicle to enable electrification, ADAS, advanced seating, and connectivity. The broader auto group has typically correlated with the cycle, and the median EV/Sales multiple has tracked closely with SAAR in the past 15 years. Higher EBITDA margins have correlated to higher stock prices in this group.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, EBITDA Growth, FCF Yield, ROIC

Valuation & Comps

EV/EBITDA to Revenue CAGR



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/EBITDA
Auto Parts							#VALUE!		
APTV	Aptiv PLC	25.3B	12.03X	-6%	20.19%	14.59%	2.14%	8.69%	0.55X
MGA	Magna International Inc (USA)	16.7B	5.92X	-4%	13.07%	8.44%	2.54%	8.28%	0.26X
LKQ	LKQ Corp	14.2B	9.35X	16%	4.51%	13.66%	8.01%	13.39%	1.43X
BWA	BorgWarner Inc.	9.5B	5.66X	17%	7.12%	14.58%	6.56%	9.3%	1.00X
LEA	Lear Corp	7.7B	6.62X	-12%	13.88%	7.13%	4.17%	6.53%	0.77X
ALV	Autoliv Inc	6.9B	8.26X	-2%	18.06%	11.29%	2.87%	7.53%	1.05X
GNTX	Gentex Corporation	6.4B	12.77X	-5%	16.64%	23.4%	1.39%	15.32%	-0.68X
FOXF	Fox Factory Holding Corp	4.2B	13.73X	34%	20.26%	20.81%	2.88%	19.51%	0.65X
ALSN	Allison Transmission Holdings Inc	3.9B	6.68X	-12%	(1.456%)	28.73%	11.19%	12.08%	2.69X
VC	Visteon Corp	3.9B	11.81X	-1%	14.07%	9.26%	0.92%	18.38%	-0.54X
ADNT	Adient PLC	3.2B	6.08X	0%	21.17%	6.22%	6.52%	0.27%	2.82X
GT	Goodyear Tire & Rubber Co	3.0B	5.06X	17%	7.41%	10.41%	-0.95%	6.14%	2.40X
DORM	Dorman Products Inc	2.7B	11.67X	29%		14.87%	#VALUE!	18.88%	0.06X
LCII	LCI Industries	2.5B	5.08X	36%	(1.638%)	10.59%	#VALUE!	10.25%	1.88X
THRM	Gentherm Inc	2.3B	18.28X	5%	26.73%	12.97%	#VALUE!	19.91%	-0.73X
DAN	Dana Inc	2.3B	6.58X	-12%	13.47%	7.57%	8.20%	4.82%	2.49X
XPEL	Xpel Inc	1.7B	26.13X	55%	31.98%	21.1%	#VALUE!	49.15%	-0.08X
AXL	American Axle & Manufact. Holdings	1.1B	4.74X	-7%	(4.871%)	12.92%	24.72%	3.44%	3.35X
MOD	Modine Manufacturing Co	1.0B	6.67X	-5%	20.24%	8.83%	#VALUE!	9.87%	1.98X
PLOW	Douglas Dynamics Inc	0.8B	12.85X	-14%	8.56%	15.13%	4.54%	3.25%	2.37X
SMP	Standard Motor Products, Inc.	0.8B	7.95X	13%		11.05%	#VALUE!	14.39%	0.31X
SRI	Stoneridge, Inc.	0.6B	20.10X	-46%	12.7%	5.34%	#VALUE!	(4.263%)	3.24X

Management Commentary

Magna (MGA) on industry dynamics…. "We continue to experience supply constraints in particular, semiconductors. Improvement in the second half of 2022 is not as much as expected. At this point, we anticipate some ongoing scheduled choppiness through the end of the year and into the first half of 2023. Input costs remain elevated with higher energy costs in Europe, the most recent factor. We continue to make progress in customer recoveries and our discussions with customers continue. Relative to our previous outlook, we expect only a modest increase in our net input cost for 2022. In terms of tailwinds, dealer vehicle inventories remained below historical levels. And to this point, underlying auto demand remains resilient and constrained by tight supply and global auto forecasters continue to expect increased light vehicle production in the coming years."

Lear (LEA) on its product portfolio…. "Our product portfolio is powertrain agnostic, well positioned for the shift to electrification, but also poised to continue to benefit from the production of ICE vehicles. Both of our business segments have outperformed industry growth rates by 6 percentage points over the past 3 years. We are the leader in automotive seating with a growing 25% market share. Lear is the largest provider of seats for luxury vehicles, and we have consistently been recognized by J.D. Power as the quality leader. Our financial returns in seating lead the industry, and we are investing in innovation to further separate Lear as the leading seating supplier. Electrification and other added content in the vehicle will drive growth in E-Systems. And we expect margins to grow as we increase scale and vertical integration across our portfolio of products. We are winning significant new business through innovative products such as the BDU and the ICB and are identifying additional opportunities across these product lines. We have a long history of driving operational excellence, and we will continue to improve manufacturing flexibility and efficiency across our operations."

Autoliv (ALV) on the Auto industry…. "Part of the auto industry continues to operate at or near recessionary levels impacted by supply chain challenges. For example, due to lack of new vehicles, European registrations year-to-date is approximately 30% lower than for the same period in 2009 during the financial crisis. In North America and Europe, the near-term production forecast continues to be limited by automakers ability to produce, not by demand. In China, light vehicle production is supported by robust EV sales and the effects from tax incentives on certain new vehicles."

OptionsHawk Executive Summary & Focus Stocks

Among the five larger-cap names **Aptiv (APTV)** is the high-margin, high growth name but also continues to command a valuation premium and may need to come in further. **Borg Warner (BWA)** screens as an attractive value and is executing a tax-free spin-off of its Fuel Systems and Aftermarket segments into a separate, publicly traded company. In the $3B to 7B market cap tier **Fox Factory (FOXF)** is a long-time favorite that continues to have a strong growth/margin profile, albeit still at a premium multiple. For the sub $3B stocks, **Gentherm (THRM)** and **Xpel (XPEL)** are premium valuation names with strong growth outlooks that can perform well in the right environment. **Allison Transmission (ALSN)** screens strong versus the group on FCF and margins though sees limited topline growth. ALSN continues to make progress building out its e-axle portfolio and also could look to make an acquisition in 2023.

<u>Auto & Truck – Commercial Vehicles</u>

Resources: ACT Research,

Components: CMI, PCAR, OSK, FSS, NKLA, TSP, WNC, REVG, SHYF, HY, WKHS

International & Private Peers: Daimler AG, Volvo, Volkswagen, MAN, Scania, Iveco, Hino, Dongfeng, Tata Motors, International Corp

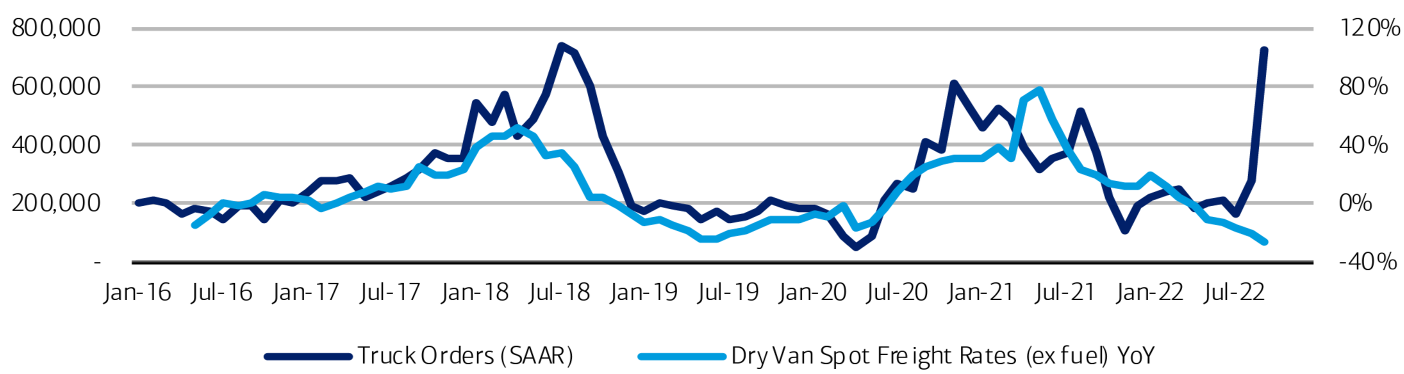
Intro

Despite concerns of a freight (and economic) recession, heavy duty truck orders surged in September. Orders set an all-time record of 53.7K (~730K SAAR, +94% YoY) on the heels of 21.6k orders in August (~289K SAAR), which had recovered from depressed levels over the summer (11.4K, ~162k SAAR in July). September results were likely driven by the opening of 2023 order boards by OEMs, with pent up demand resulting in a large influx of orders that would normally be spaced over months (OEMs restrained slots to manage supply conditions). Truck orders stand in contrast to trends: ISM New Orders fell to 47.1 (sub 50 = contraction), spot freight rates decline. PCAR's newly minted FY23 US & Canada retail sales outlook of 260-300K offers a resounding endorsement of cycle durability into '23 vs. ACT's more draconian '23 outlook of ~256K (for equivalent markets) - and with mgmt. speaking to tailwinds from fleet age reduction efforts, fuel efficiency-driven replacement catalysts and a resilient freight backdrop (incl. within Europe), this should help to crystallize higher industry-level estimates.

Industry Backdrop & Investment Considerations

The heavy-duty truck market is expected to reach $430B by 2026 at a 4% CAGR. The Europe hybrid electric truck market valued at around $3B in 2019 and will observe growth rate of over 10% through 2026. The high market growth in the hybrid electric segment will be driven by stringent emission norms established by governments.

Dry Van Spot Freight rates YoY typically lead truck orders to some extent



Four key trends across the commercial vehicle industry include newer logistics, electrification, autonomous and digitalization. Several of the larger players are foreign and offer good insights throughout earnings season such as Daimler AG, Volvo, Traton, and Dongfeng.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, EBITDA Growth, Inventory Turnover, ROIC, SG&A % of Sales

Valuation & Comps

EV/EBITDA to EBITDA CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/EBITDA
Commecial Vehicles							#VALUE!		
PCAR	PACCAR Inc	35.2B	9.98X	-4%	6.04%	13.88%	6.37%	4.76%	2.06X
CMI	Cummins Inc.	33.6B	10.24X	-3%	(7.533%)	12.06%	5.73%	14.81%	0.18X
OSK	Oshkosh Corp	5.7B	12.11X	-24%	24.1%	6.82%	3.83%	16.12%	-0.18X
FSS	Federal Signal Corporation	2.8B	14.09X	-3%	6.63%	15.44%	137.83%	9.3%	1.03X
WNC	Wabash National Corporation	1.1B	7.00X	-23%	0.35%	9.89%	3.34%	1.94%	2.70X
NKLA	Nikola Corp	1.1B	-2.21X	51%	(71.284%)	(436.995%)	-75.03%	(165.866%)	2.14X
SHYF	Shyft Group Inc	0.8B	14.06X	26%	36.84%	9.46%	#VALUE!	32.77%	-0.08X
REVG	Rev Group Inc	0.8B		18%	16.43%	4.96%	7.57%	9.23%	1.88X
HY	Hyster-Yale Materials Handling Inc	0.5B	597.44X		1.78%	(1.595%)	#VALUE!	(27.824%)	-2.78X
TSP	Tusimple Holdings Inc	0.4B	1.77X	122%	(4.094%)	(3528.081%)	-98.28%	3030.58%	2.03X
WKHS	Workhorse Group Inc	0.3B	-1.67X	179%		(3110.67%)	-34.01%	(147.216%)	0.07X

Management Commentary

PACCAR (PCAR) on Parts division in a slowing freight market and the truck industry in a slowing Macro…. "One of the things that's wonderful about the team here is that they've done a great job of developing a very robust Parts system that serves the customers well, and I think that's one of the key elements that's driving the performance of the business, is having the right systems and capabilities to provide customers trucks. We've expanded our footprint and distribution centers around the world. That enables us to be even a better partner with our dealers and our customers, so that helps the performance and insulates us a little bit from cyclicality, gives us a strong recurring revenue business. We've seen the growth of our engine business around the world over the several past years, which also gives us a strong future look into the parts business. And I think that with the elevated fleet age, we're going to continue to see strong Truck performance and Parts performance for the next while. We think about the truck industry and what's going on within the truck industry that's driving the volumes. And as you look at it, right, freight demand is at very high levels. Truck utilization is at a high level. And the age of the trucks out in the park has increased for the past 3 years, and there continues to be supply-based constraints that limit build. When you put all of that together and combine it with the excellent new products that are delivering like 7% to 10% better fuel economy for our customers, which is thousands of dollars per trucks per year in savings, it points to a really good market for PACCAR next year."

OptionsHawk Executive Summary & Focus Stocks

Investors are growing more cautious on 2023 being the potential peak year for trucking which makes it a tough space to have confidence for the full year despite recent resilience. The two large caps trade at similar valuation despite **PACCAR (PCAR)** the higher margin and better growth name, so that is the preferred play and also like the moves the company is making into autonomous. **Federal Signal (FSS)** is the most interesting of the smaller names in this group though already trades pricey at 14X EBITDA. FSS has nice exposure to stimulus and has also been doing some interesting tuck-in deals. **Shyft Group (SHYF)** a favored small cap also at 14X EBITDA seeing very strong growth continuing with a strong balance sheet and improving vehicle deliveries.

Auto & Truck – Recreational Vehicles – RV's and Powersports

Resources: RVIA, RV News, NMMA, Motorcycle Industry Council,

Components: PII, HOG, BC, THO, DOOO, CWH, WGO, PATK, MBUU, JOUT, MCFT, MPX

International & Private Peers: Honda, Suzuki, Yamaha, Bajaj Auto, Eicher Motors, Groupe Beneteau, Azimut-Benetti, Ferretti

Intro

This group saw the post-pandemic normalization hit hard across the Boat and RV names while HOG was the only name to gain on the year. HOG is a turnaround story improving margins and spinning off LiveWire while there are secular risks around declining industry motorcycle sales.

Industry Backdrop & Investment Considerations

The overall Power Sports market is estimated to reach $50B by 2026 at a 6% CAGR. The US motorcycle market is seen rising to near $11B in 2025 at a 3.7% CAGR with Harley Davidson having ~ 47% market share. The global market is much larger seen rising to $157B by 2026 at a 3.9% CAGR from $116B in 2018. The demand for motorcycles is directly driven by the increasing middle-class population across the globe, which in turn is surging the demand for affordable means of transport, such as motorcycles and scooters. The off-road vehicle market was valued at $19.5B in 2017 and seen rising at a 5.5% CAGR through 2024 to around $23.5B. Rising discretionary spending in conjunction with the improving economic conditions is increasing the participation in outdoor activities, expanding the U.S. off-road vehicle (ORVs) market size. The recreational boating market reached $43B in 2019 and is seen growing at a 5% CAGR through 2026 to around $63B.

Consumer Confidence & Discretionary Spending are key Macro indicators that drive demand across this group.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, FCF Yield, EBITDA Growth, Revenue Growth

Valuation & Comps

EV/EBITDA to EBITDA Margins

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/EBITDA
RV & PowerSports							#VALUE!		
HOG	Harley-Davidson Inc	6.6B	10.98X	9%	8.59%	26.18%	8.71%	8.41%	5.43X
PII	Polaris Inc	6.1B	7.41X	17%	9.1%	13.66%	7.14%	18.73%	1.01X
DOOO	BRP Inc	6.1B	6.48X	35%	7.79%	18.01%	8.39%	61.07%	1.06X
BC	Brunswick Corporation	5.2B	5.80X	29%	8.49%	20.06%	5.19%	20.77%	0.86X
THO	Thor Industries, Inc.	4.4B	6.30X	73%	6.89%	8.9%	16.09%	22.81%	0.74X
CWH	Camping World Holdings Inc	2.0B	6.43X	138%	8.22%	9.34%	21.14%	27.76%	2.01X
WGO	Winnebago Industries, Inc.	1.7B	5.04X	96%	15.33%	11.81%	19.04%	31.9%	0.29X
PATK	Patrick Industries, Inc.	1.3B	4.04X	45%	4.68%	11.33%	23.67%	12.07%	2.12X
MBUU	Malibu Boats Inc	1.1B	4.51X	49%	4.3%	18.88%	15.92%	33.66%	0.28X
JOUT	Johnson Outdoors Inc.	0.7B		27%		13.4%	#VALUE!	38.61%	-1.82X
MCFT	Mastercraft Boat Holdings Inc	0.5B	4.24X	65%	(0.714%)	21.2%	195.58%	51.64%	0.31X
MPX	Marine Products Corp	0.4B		6%		15.83%	#VALUE!	22.16%	-0.56X

Management Commentary

Thor (THO) on RV industry outlook…. “There is no industry that has a greater upside than the RV industry right now. We have short-term macroeconomic challenges that everyone is well aware of. But the underlying demographics that have driven the secular shift in demand are undeniable. If people aren't seeing that and seeing the long-term upside in our industry, then they're not paying attention to what's happened. When we look at dealer inventories, again, there's been a lot of chatter about that. Our towable inventories are at or near optimal depending on product segment and brands. And there's no doubt that we're more on a one-for-one replenishment cycle for those particular product segments. However, our motorized inventory levels still remain very low in terms of optimal inventory levels. And that's largely due to chassis constraints that we've had. And we expect the chassis constraints to go into 2023 before it starts to clear up. Still feel like it's going to be a very good year in RV. We're still investing for the future. RV service is off the charts. So if you think about the number of units we've sold, that's actually a very, very strong part of the business. So we're very focused on investing in that part. It's higher margin, also builds more customer loyalty. When we talk long-term retail outlook on the last part of this slide, you will see where we believe passionately by 2027, that our industry will achieve the range of anywhere from 585,000 to 630,000 retail sold units in 2027."

OptionsHawk Executive Summary & Focus Stocks

All of the names in this group fall into the small cap class and a weaker consumer spending backdrop couples with still coming off a record demand period makes it a difficult group to be bullish in 2023 despite containing profitable companies with high ROIC. Slowing growth will remain a theme so **Brunswick (BC)** screens favorable as a higher margin name with more resilient growth. **BRP (DOOO)** continues to impress with results and trades just 6.5X EBITDA with strong FCF and margins. **Winnebago (WGO)** offers the best forward-growth profile of the group and trades 5X EBITDA with a very strong FCF yield.

Auto & Truck – Dealers

Resources: Edmunds, NADA, Cox Automotive,

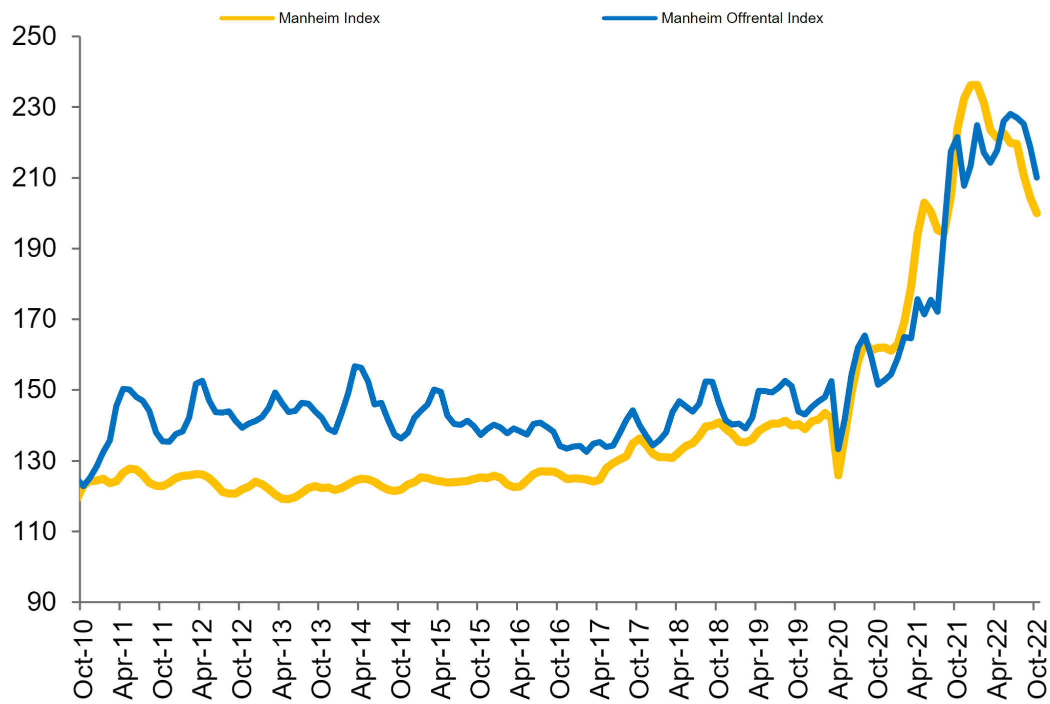
Components: CPRT, KMX, PAG, RBA, AN, LAD, IAA, ABG, ATHM, CVNA, RUSHA, GPI, SAH, CARG, KAR, ACVA, CARS, CRMT, CANG

International & Private Peers: Cox Automotive, Hendrick Automotive, Scout 24 AG, Van Tuyl

Intro

After a historic rise in vehicle sales and used car prices the industry is facing tougher times with lighter pricing and weaker overall units. LAD management recently noted a focus on achieving greater operational efficiencies (via rightsizing store and e-commerce cost structures, and efficiencies from e-commerce integration), further industry consolidation, and conservative capital allocation.

Manheim continues to show weakening pricing which leads to earnings risk across the group. The October reading posted the first double-digit Y/Y decline since the Great Financial Crisis and the index has moved lower eight of the last nine months. Compared to 2021, used car sales have slowed as consumers are beginning to be impacted from rising rates, elevated prices, and inflationary pressures in their everyday lives. As per Cox Automotive, inventory levels remain tighter at lower price segments. There is clear demand destruction occurring across the industry. Dealers are most exposed to a decline in pricing which would impact their gross profit margins.



Industry Backdrop & Investment Considerations

The used auto market in the US is a well-defined TAM. Many dealers acquire cars from the same auctions and look to acquire customers from similar regional and local markets. The TAM is around $900B with 42K auto dealers in the US and millions of peer-to-peer transactions each year. The market is highly fragmented with the top 100 dealers accounting for less than 10% of sales while ecommerce penetration is extremely low where convenience, transparency, and selection offerings can take significant market share.

The auto retail industry is confronting a range of disruptive challenges including vehicle electrification, autonomy, connected cars, and a host of start-ups going direct-to-consumer and bypassing the traditional franchise route altogether.

Indicators, Metrics & Stock Selection Framework

Debt to EBITDA, Inventory Ratios, EV/Revenues, P/E, Gross Margins, Vehicle ASPs, Gross Profit Per Unit (GPU)

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR FY-2 to FY 0)	EBITDA CAGR (FY23 to FY25)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	Debt/EBITDA
Dealerships							#VALUE!		
CPRT	Copart, Inc.	30.4B	18.29X	28%	16.38%	39.27%	2.82%	35.16%	-0.67X
KMX	CarMax, Inc	10.5B	23.89X	12%	11.38%	3.24%	493.15%	5.3%	9.27X
PAG	Penske Automotive Group, Inc.	8.9B	7.84X	34%	(10.672%)	7.46%	#VALUE!	20.1%	2.01X
RBA	Ritchie Bros Auctioneers Inc	6.3B	13.39X	6%	1.92%	24.92%	#VALUE!	2.49%	2.80X
LAD	Lithia Motors Inc	6.0B	6.08X	88%	24.38%	6.99%	-7.48%	17.97%	2.24X
AN	AutoNation Inc	5.8B	4.00X	44%	(3.76%)	8.59%	#VALUE!	27.37%	1.12X
IAA	IAA Inc	5.2B	11.74X	15%	6.52%	22.77%	2.90%	24.13%	2.13X
ATHM	Autohome Inc (ADR)	4.2B	5.68X	-17%	(5.269%)	23.94%	#VALUE!	15.02%	-6.45X
ABG	Asbury Automotive Group, Inc.	4.0B	5.44X	50%	16.34%	8.51%	#VALUE!	15.13%	3.67X
GPI	Group 1 Automotive, Inc.	2.8B	4.82X	54%	(8.448%)	6.95%	#VALUE!	21.43%	2.53X
RUSHA	Rush Enterprises Inc	2.7B	6.60X	16%	(11.98%)	9.57%	12.36%	11.84%	2.42X
SAH	Sonic Automotive Inc	1.9B	6.35X	36%	7.39%	5.12%	#VALUE!	17.5%	3.61X
CARG	CarGurus Inc	1.5B	7.75X	80%	29.04%	9.11%	7.83%	79.2%	-1.23X
KAR	KAR Auction Services Inc	1.5B	9.66X	-8%	66.38%	17.68%	#VALUE!	5.79%	3.26X
ACVA	ACV Auctions Inc	1.4B	-15.06X	-5%		(11.235%)	-7.25%	1342.18%	6.33X
CVNA	Carvana Co	1.0B	-7.26X	-85%		(6.468%)	-188.06%	(5.365%)	-580.06X
CARS	Cars.com Inc	0.9B	7.33X	6%	7.69%	26.14%	12.22%	5.56%	2.49X
CRMT	America's Car-Mart, Inc.	0.5B	12.46X	33%	20.64%	3.9%	#VALUE!	12.18%	2.43X
CANG	Cango Inc - ADR	0.2B	4.19X	-38%			#VALUE!	(10.863%)	-15.92X

Management Commentary

Copart (CPRT) on it being a sustainability play and driving metrics…. “Copart is a keystone enabler of the circular economy in the automotive sector. Our retrievable and storage of vehicles, title processing and online marketplace are essential to the reuse, harvesting and recycling of literally millions of cars per year. We estimate that approximately 2 out of every 5 vehicles we sell are driven again somewhere in the world, the remainder are harvested and recycled for parts or metals reducing the need for de novo mineral extraction and manufacturing emissions. Driving activity itself, as measured in vehicle miles driven, continues its rebound to pre-pandemic norms in the aggregate. Seasonally adjusted miles traveled for the month of May, for example, in the U.S. is up about 1 percentage point versus last year. Gasoline consumption statistics mirror the same themes as well. Contrary to consistent long-term trends, we have observed declining total loss frequency on a sequential and year-over-year basis. We believe firmly that the market will revert to the historical norm of steadily rising total loss frequency in the months and years ahead. And in fact, a number of other variables, accident severity, repair duration, repair, labor costs, rental car cost, part costs should contribute to that reversion and long-term trend as well.”

CarMax (KMX) on industry pressures…. “This quarter reflects widespread pressure the used car industry is facing. Macro factors, including vehicle affordability that stem from persistent and broad inflation, climbing interest rates and low consumer confidence, all led to a market-wide decline in used auto sales. In addition, wholesale values were affected by steep depreciation in the quarter. We believe industry sales were also impacted by a shift in consumer spending prioritization from large purchases to smaller discretionary items. In response to the current environment and consumer demand, we have continued to offer a higher mix of lower-priced vehicles.”

Penske (PAG) on leasing with rates higher… “So as everybody understand what happened with leasing prior to the pandemic and where it is now. So if you look at the marketplace in the U.S., it's probably 35-ish percent, call it, 30% to 35% leasing in the marketplace. It's now 20-ish percent. The premium luxury side of the market was a good 55% leasing, if not as high as 60%. The advantage of leasing was the lower payment. And sometimes it was incentivized by the OEM, there might have been a subvented rate and that like -- that's gone now. So leasing has gone down dramatically during the overall pandemic. And I don't see it coming back anytime soon, at all. And as a result, what's happened is more consumers are either holding onto their cars longer. They're buying out their existing leases because they come back in to maybe lease a BMW 5 Series or an X5, and their payment goes from $600 a month to $1,100 a month, and you get sticker shock on them. So what they're doing is they're extending their leases, they're buying out their leases that's impacting used vehicle prices, it's also impacting lease returns. So I don't see that changing any time soon and part of that is the interest rates that you talked about, too, with interest rates going up, it just adds an additional amount of payment under the consumer. So that being said, the demand hasn't waned. They're still out there placing those orders to buy vehicles in the future.”

OptionsHawk Executive Summary & Focus Stocks

With concerns across the industry the favored large cap in **Copart (CPRT)** which has always carried a premium valuation with its strong margins and continues to see more resilient growth ahead with further market share gains. **Asbury (ABG)** screens most favorable among the dealerships despite the tough environment. Richie (RBA) is currently trying to acquire IAA (IAA) in a deal.

Food & Beverage – Beverages

Resources: Nielsen IQ Data

Components: KO, PEP, DEO, BUD, KDP, MNST, STZ, ABEV, FMX, CCEP, TAP, CELH, FIZZ, SAM, PRMW, CCU, NAPA, OTLY, COCO

International & Private Peers: Heineken, Pernod Ricard, Carlsberg, Remy Cointreau, Royal Unibrew, Nestle, Suntory, Kirin, Bacardi, Danone, FeverTree, Britvic, JDE Peets

Intro

The Beverage group was one that consistently posted strong numbers throughout the year and the majority of the quality names are higher YTD. Companies with the strongest pricing power/limited demand elasticity in the CPG group should outperform. Pricing power has been a key factor to beverage outperformance along with improved execution and structural drivers. Private label (PL) YoY share gains continued in both HPC and beverages in recent US scanner data, but the pace of gains is moderate and has actually slowed slightly sequentially the last few months.

Industry Backdrop & Investment Considerations

Ongoing trends include consumers trending towards healthier choices with low-sugar and low-calorie offerings while caffeine demand continues to rise. Soft drink makers have also been diversifying portfolios into higher growth segments such as alternative water and energy drinks. As with the recent of the consumer goods industry, private labels are also taking market share across beverage segments.

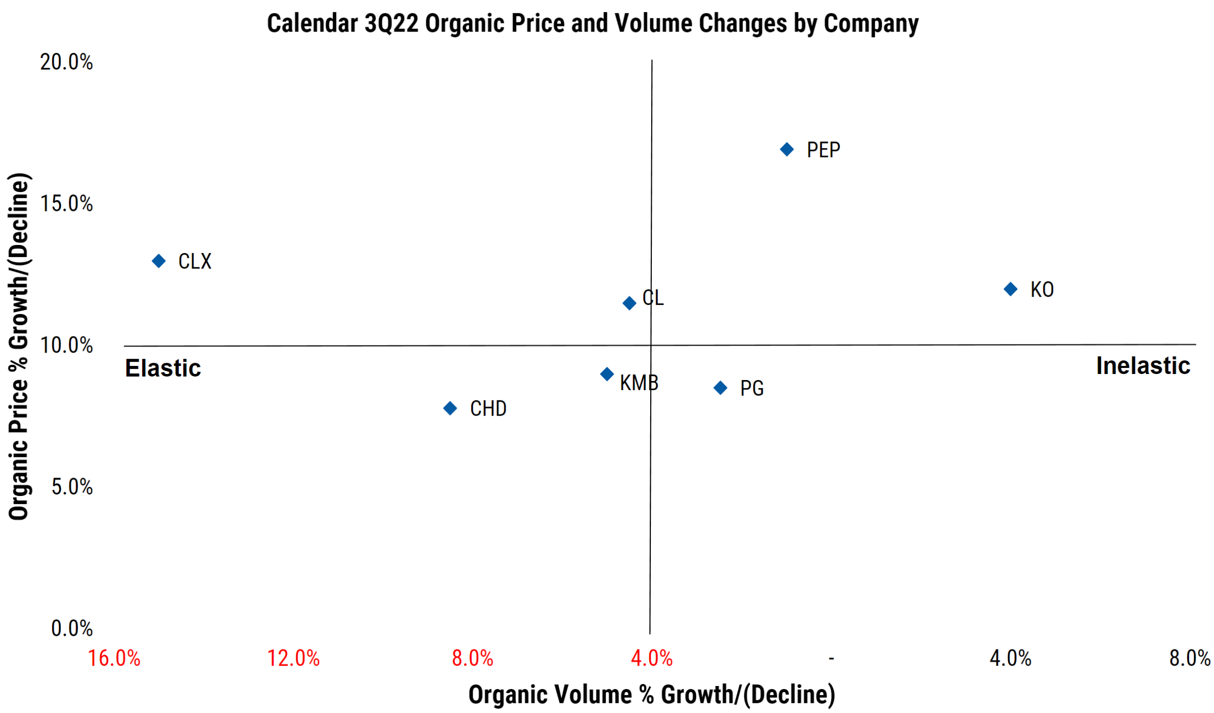
Persistent FX headwinds, cost pressures and higher interest expense on floating debt are headwinds into 2023 along with a more cost-conscience consumer.

Indicators, Metrics & Stock Selection Framework

Volume Growth, Operating Margins, Organic Sales Growth, P/E

Valuation & Comps

EV/EBITDA to EBITDA CAGR



Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Beverages							#VALUE!	
KO	Coca-Cola Co	273.0B	22.40X	5.37%	7.63%	28.74%	3.83%	5.35%
PEP	PepsiCo, Inc.	252.3B	18.84X	5.13%	7.1%	14.36%	4.18%	5.68%
BUD	Anheuser-Busch Inbev SA (ADR)	119.1B	10.41X	4.83%	6.3%	26.59%	7.07%	3.09%
DEO	Diageo plc (ADR)	104.0B	14.04X	5.78%	8.12%	31.04%	#VALUE!	6.91%
KDP	Keurig Dr Pepper Inc	53.7B	15.89X	4.19%	3.22%	26.97%	4.72%	3.43%
MNST	Monster Beverage Corp	52.2B	29.51X	11.56%	12.25%	32.44%	2.05%	29.87%
STZ	Constellation Brands, Inc.	50.3B	17.59X	6.73%	9.88%	31.61%	3.29%	6.14%
ABEV	Ambev SA (ADR)	46.7B	9.46X	7.89%	11.18%	23.98%	#VALUE!	
FMX	Fomento Economico Mexicano SAB (ADR)	28.1B	160.24X	10.65%	10.93%	9.81%	#VALUE!	5.25%
CCEP	Coca-Cola Europacific Partners PLC	24.6B	11.27X	3.9%	4.11%	12.88%	8.08%	4.16%
TAP	Molson Coors Beverage Co	11.4B	8.72X	0.95%	1.05%	12.32%	8.90%	3.79%
CELH	Celsius Holdings, Inc.	8.7B	110.78X	34.55%	50.8%	(1.301%)	0.61%	3.0%
FIZZ	National Beverage Corp.	4.7B	23.31X	5.88%	15.57%	18.26%	2.36%	(63.31%)
SAM	Boston Beer Company Inc	4.4B	19.13X	6.25%	17.19%	0.39%	3.52%	1.66%
PRMW	Primo Water Corp	2.5B	9.17X	7.54%	6.96%	10.1%	5.44%	2.03%
CCU	Compania Cervecerias Unidas S.A. (ADR)	2.2B	6859.39X	7.52%	10.66%	12.91%	#VALUE!	(2.388%)
NAPA	Duckhorn Portfolio Inc	1.9B	15.51X	7.68%	9.09%	27.82%	2.71%	6.68%
OTLY	Oatly Group AB - ADR	0.8B	-3.17X	24.07%		(28.528%)	-6056.34%	(25.196%)
COCO	Vita Coco Company Inc	0.7B	35.16X	13.37%	45.82%	6.48%	-1.22%	25.41%

Management Commentary

Constellation Brands (STZ) on alcohol trends, demographics, DTC and Canopy…"Buy rate, which captures both the number of trips a consumer makes and the amount they spend per trip, increased in the second quarter for both high-end beer and total wine categories in tracked channels. And buy rate for Hispanic high-end beer consumers, which is particularly relevant to our core beer portfolio, is also proving resilient. Third, the transformation of our Wine & Spirits business continues to yield results. Over the past few years, this business has been evolving from a U.S. wholesaler business focused mainly on the mainstream segment to a global omni-channel competitor primarily focused on the higher end. The new nonalcoholic drinking age consumer is an attractive target as they also consume high-end beer as well as spirits and hard seltzers. So we are excited about the extension of Corona into this segment, and we look forward to sharing more details as we approach the product launch. Wine & Spirits DTC net sales grew 15% in the second quarter as our investments in these channels continue to yield strong performance. In the U.S., as Bill noted in his remarks, it's now a $25 billion retail sales opportunity in those states where it's legal. So it is starting to convert consumers, and consumers are adopting to the category. And we are happy with the position that Canopy has in the U.S. and with the improvements that they're making in Canada."

Coca Cola (KO) on marketing and innovations…. "As we look forward beyond this year, we continue to see great opportunity for our industry. We are allocating resources in a disciplined way to gain share. Success from our marketing model is based on 2 critical components: linking occasions and passion points to drive engagement and leveraging experiments to optimize our marketing. This drives deeper connections with consumers, reaching them in new and unique ways. Our innovations have delivered strong results with more than 25% contribution to incremental gross profit year-to-date. Our innovations span markets and categories, with 55% of year-to-date innovations outside of the sparkling category. Our pipeline is robust and we are excited about their unique consumer propositions."

Monster (MNST) on its alcohol launches…. "Our first alcohol-based product line to leverage Monster's brand equity is scheduled to launch in the first quarter of 2023. The Beast Unleashed will be a full-bodied flavored malt beverage with 6% alcohol by volume and will come in 4 bold flavors, Mean Green, White Haze, Peach Perfect and Scary Berries, all of which are based on Monster's well-known and popular flavor profiles. CANarchy will introduce The Beast Unleashed through certain beer distributors in the United States, utilizing a phased approach launch, with the goal of being national by the end of 2023. Our alcohol innovation pipeline is robust. In addition to The Beast Unleashed, we will relaunch Wild Basin Hard Seltzer with new packaging and great new flavors and taste profiles."

OptionsHawk Executive Summary & Focus Stocks

In the $50B+ market cap group, **Monster (MNST)** continues to be the best-in-class growth/margins name while having some potential ahead with its move into alcoholic beverages. **Constellation (STZ)** annually screens as a top name and no change this year as it continues to execute well and benefit from the premiumization trend. Among the remaining large cap names **Celsius (CELH)** is a top growth name that could become a takeover target. **Duckhorn (NAPA)** had a tough year but screens favorable among the small caps from a growth and margin perspective though still commands at 15X multiple.

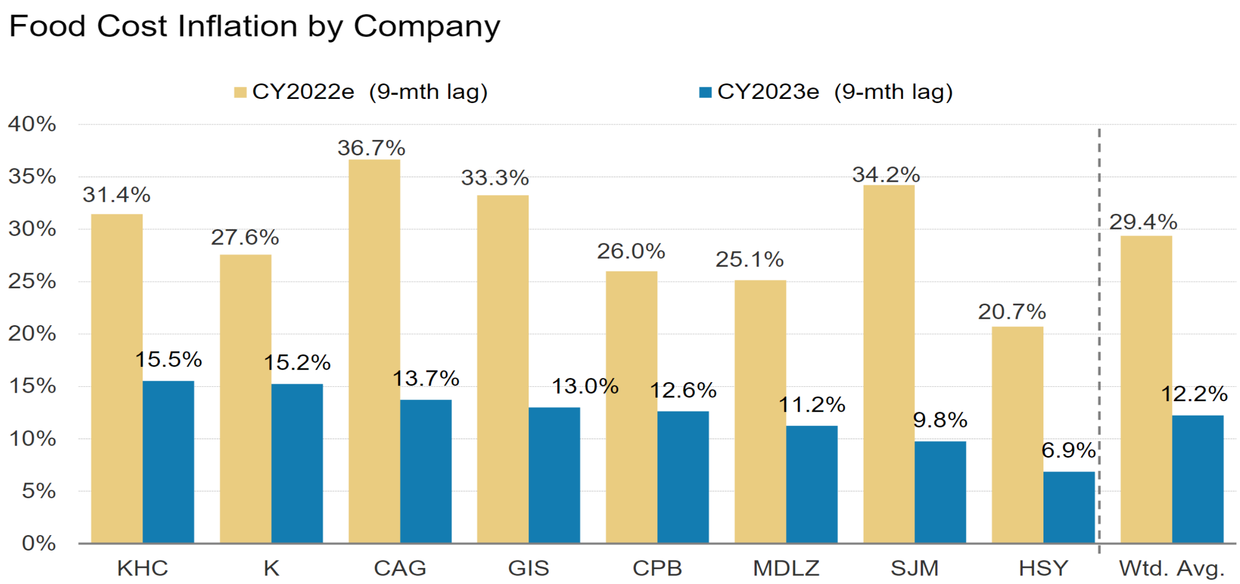
Food & Beverage – Food

Components: MDLZ, HSY, GIS, KHC, K, HRL, MKC, CAG, SJM, CPB, LW, FLO, INGR, POST, LANC, TWNK, SMPL, BRBR, FRPT, TR, JJSF, THS, NOMD, UNFI, UTZ, HAIN, BRCC, SOVO, BGS, STKL, BYND

International & Private Peers: Nestle, Mars, JBS, Danone, Unilever, Associated British Foods, Ferrero, Arla Foods, BRF Brazil Foods, Marfrig, Kerry Group, Lindt & Sprungli, Barry Callebaut

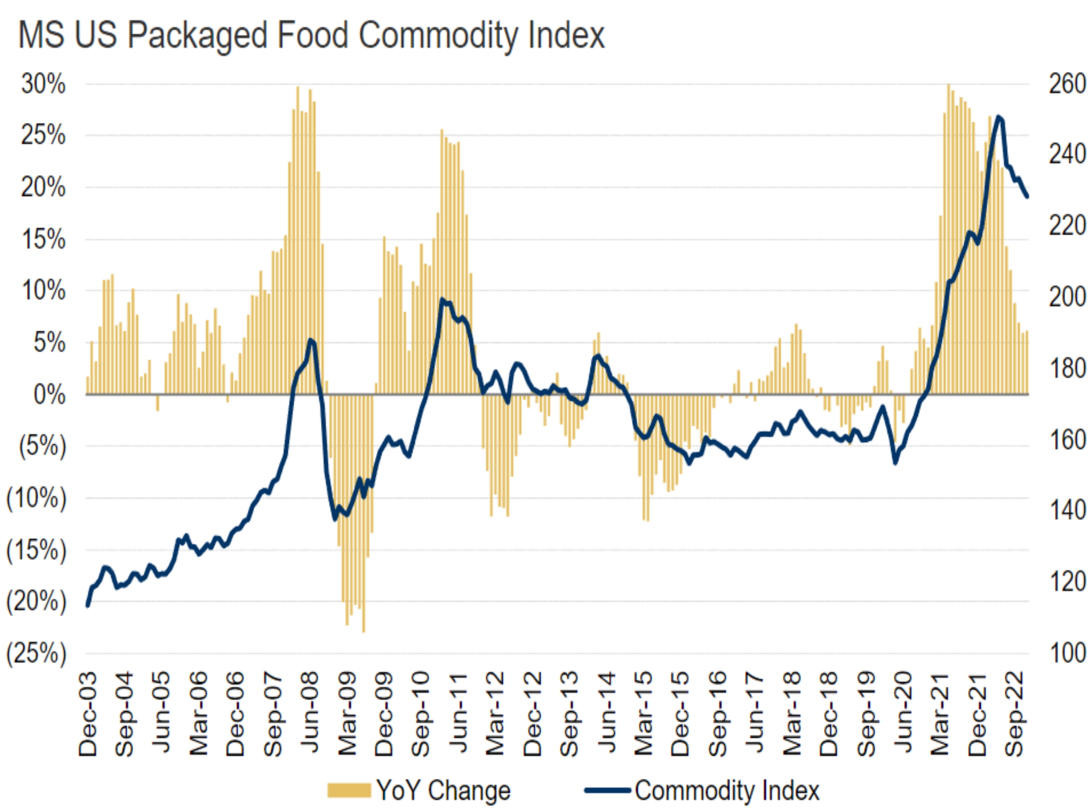
Intro

Packaged Food companies have reported uncharacteristically strong topline growth driven by robust price realization/modest volume declines, experience ongoing gross margin pressure, and increase brand building investment as inventory levels improve. The group offers solid fundamentals and defensive positioning but at elevated historical valuations. It is also a group that will face tough comps in 2023 along with consumer trade-down risk. Q3 commentary points to elevated input cost inflation in 2023 as another headwind. Packaged food and beverage average pricing continue to escalate, with the latest 4-week period being the highest it's been in a year at +14.2% Y/Y. That said, the US personal savings rate continues to drop below pre-pandemic rates, despite wage growth across all income levels.



Industry Backdrop & Investment Considerations

Confectionery, Snacks & Ready-to-eat are among the largest categories within Packaged Foods. It is expected to reach $601.3B by 2023, with a CAGR of 2.4%. Biscuits is a $99B market, Chocolate $107B, Candy $63B and Gum $21B.



Private Label - Private label had made consistent inroads over the past several years with its perception shifting from just an inexpensive alternative to quality substitutes, with market share gains prior to Covid outbreak. However, Covid outbreak drove supply chains under pressure, and more so for private label, which weren't ready to service significantly higher demand levels. As a result, private label lost market share in 2020 and 2021. However, with supply chains improving, private label has begun to take market share again in 2022.

Floating debt leading to higher interest expense is an industry-wide concern:

Company	Ticker	Total Debt $ in mms (latest 10Q/10K)	% floating (USD)
Packaged Food			
Mission Produce Inc.	AVO	$157.7	100.0%
BellRing Brands Inc	BRBR	$924.0	9.1%
Beyond Meat Inc.	BYND	$1,150.0	0.0%
Cal-Maine Foods, Inc.	CALM	$0.0	NA
Campbell Soup	CPB	$4,561.0	5.5%
Conagra Brands, Inc.	CAG	$9,090.4	6.9%
DOLE	DOLE	$1,302.8	100.0%
Freshpet, Inc.	FRPT	$78.0	100.0%
General Mills Inc	GIS	$11,561.9	15.1%
The Hershey Company	HSY	$4,093.0	22.4%
Hormel Foods Corp.	HRL	$3,300.0	0.0%
The JM Smucker Company	SJM	$4,738.0	8.2%
Kellogg Co	K	$7,012.0	4.6%
Kraft Heinz Company	KHC	$20,918.0	0.0%
Lamb Weston Holdings Inc	LW	$2,748.5	21.0%
McCormick & Co.	MKC	$5,422.7	27.6%
Mondelez International	MDLZ	$19,701.0	3.4%
Pilgrim's Pride Corp.	PPC	$3,428.0	20.0%
Sovos Brands, Inc.	SOVO	$480.8	100.0%
Tyson Foods, Inc.	TSN	$8,328.0	0.0%
Utz Brands	UTZ	$898.8	44.3%

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, Organic Revenue Growth, FCF Yield

There is a strong correlation in the consumer staples sector between forward P/E multiples and organic revenue growth rates. Historically, Staples had traded closely in sync with the inverse of 10-year treasury rates.

Valuation & Comps

EV/EBITDA to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Packaged Food							#VALUE!	
MDLZ	Mondelez International Inc	91.6B	18.23X	3.45%	8.24%	16.63%	3.46%	4.71%
GIS	General Mills, Inc.	50.9B	15.98X	2.26%	3.84%	16.92%	4.78%	5.7%
KHC	Kraft Heinz Co	48.9B	11.53X	0.9%	4.49%	20.18%	6.42%	2.32%
HSY	Hershey Co	48.6B	19.76X	3.63%	4.29%	22.89%	3.17%	13.29%
HRL	Hormel Foods Corp	25.7B	17.00X	2.75%	5.56%	10.54%	#VALUE!	4.43%
K	Kellogg Company	24.7B	13.46X	1.51%	2.34%	12.73%	7.32%	6.28%
MKC	McCormick & Company Inc	22.9B	23.72X	2.6%	5.34%	17.43%	3.89%	5.54%
CAG	Conagra Brands Inc	18.2B	12.18X	1.4%	3.59%	14.36%	4.84%	3.16%
CPB	Campbell Soup Company	16.7B	12.61X	0.92%	2.48%	15.15%	5.34%	5.16%
SJM	J M Smucker Co	16.5B	13.04X	2.34%	5.38%	18.0%	3.53%	4.33%
LW	Lamb Weston Holdings Inc	12.3B	16.19X	10.9%	16.4%	10.84%	#VALUE!	6.59%
INGR	Ingredion Inc	6.4B	8.63X	2.37%	10.88%	9.94%	#VALUE!	6.48%
FLO	Flowers Foods, Inc.	6.1B	13.43X	1.22%	1.44%	8.73%	#VALUE!	4.23%
LANC	Lancaster Colony Corp.	5.5B	20.24X	4.77%	11.08%	10.16%	#VALUE!	8.53%
POST	Post Holdings Inc	5.3B	10.33X	1.32%	4.45%	9.97%	#VALUE!	0.95%
SMPL	Simply Good Foods Co	3.9B	16.97X	6.57%	9.02%	20.05%	4.28%	9.58%
BRBR	Bellring Brands Inc	3.4B	13.67X	9.78%	7.85%	16.54%	#VALUE!	(10.369%)
TWNK	Hostess Brands Inc	3.3B	14.26X	4.79%	9.54%	18.17%	#VALUE!	4.73%
TR	Tootsie Roll Industries, Inc.	3.2B				11.76%	#VALUE!	6.19%
JJSF	J & J Snack Foods Corp	3.0B	16.01X	4.58%	11.46%	5.07%	#VALUE!	0.44%
NOMD	Nomad Foods Ltd	3.0B	9.41X	2.47%	3.8%	15.92%	#VALUE!	7.13%
FRPT	Freshpet Inc	2.8B	143.77X	26.44%	82.69%	(5.796%)	#VALUE!	(5.687%)
THS	TreeHouse Foods Inc.	2.5B	15.69X	3.41%	21.75%	3.56%	#VALUE!	1.61%
UTZ	Utz Brands Inc	2.5B	24.97X	3.64%	18.3%	10.56%	-36.87%	4.37%
UNFI	United Natural Foods Inc	2.3B	5.61X	3.47%	2.68%	1.87%	10.35%	7.64%
HAIN	Hain Celestial Group Inc	1.6B	12.89X	4.36%	19.38%	7.5%	6.85%	5.33%
SOVO	Sovos Brands Inc	1.3B	14.64X	7.74%	6.69%	14.54%	#VALUE!	(37.408%)
BRCC	BRC Inc	1.3B	-46.03X	28.55%	196.08%	(4.967%)	#VALUE!	#########
STKL	SunOpta, Inc. (USA)	1.0B	16.35X	(3.585%)	10.63%	2.09%	#VALUE!	1.2%
BYND	Beyond Meat Inc	0.9B	-6.09X	22.6%	(76.108%)	(37.644%)	-42.56%	(47.481%)
BGS	B&G Foods Inc	0.9B	11.14X	1.18%	13.15%	11.4%	#VALUE!	(0.041%)

Management Commentary

Mondelez (MDLZ) on the challenging operating environment and snacking markets…. "First, we continue to face elevated input cost inflation, especially in the areas of energy, transportation, packaging, wheat, dairy and edible oils. To offset these challenges, we have implemented appropriate price increases across key markets, including Europe. Second, in terms of energy inflation and continuity, we remain focused on risk management tools and alternative sources to help mitigate the impact. And third, we continue to manage through volatility in the supply chain, especially in the U.S. due to labor shortages at third party as well as a continuing shortage of trucking capacity and containers. Our latest research shows that snacking continues to play a central role in consumers' lives. And as a result, our core categories of chocolate and biscuits remain resilient. Consumers in developed markets continue to prioritize groceries over other forms of spending, and they continue to view our brands as affordable indulgences. Meanwhile, in emerging markets, consumer confidence remains strong with growing demand for our categories and continued loyalty to our iconic brands. Because of this enduring brand loyalty, private label share is either flat or down in the vast majority of our markets. Shoppers continue to say they are much less likely to switch to private label in chocolate and biscuits compared to other categories. With the return to school, we are seeing growth in products popular for school lunches like biscuit multipacks here in the U.S. We're also seeing continued growth in chocolate bars, treat sizes, gifting and seasonal shapes in Europe."

Kraft Heinz (KHC) on private label risks…. "First of all, as we have been continuously reiterating our exposure to private label have reduced significantly after the diversion mid last year. So now the average market share in our portfolio is about 11%, wherein across food and beverage is 20%. So that we are not impacted. Second, during the past 3 years, as part of our transformation, we have been interacting a lot of our effort and energy around the core. So resources have moved there. We have been renovating the core in a very systematic way, so our portfolio is stronger. Third, the private label have been increasing the price together with the rest of the players. So as recent as the last 4 weeks, including already 3 weeks of October, looking at sellout data, our sellout price is about 17% up, whereas private label is 16% up. So price gaps are widely preserved. We don't want to be even over optimistic that depending on how consumers eventually shift behavior in a very drastic way, things can change, but there is no indication of that as of right now. And honestly, I mean, despite all the environment, food is proving to be very resilient. The brands are being very resilient. And with an important that we use right now. When I was here back in 2008, 2011, we only had to accelerate a shift in behavior, but unemployment starts to go up, which is far from the reality today."

OptionsHawk Executive Summary & Focus Stocks

Kraft (KHC) is a name I would highlight as an attractive value at 11X EBITDA with less private-label risk and an improving outlook for growth. Snacks continues to be the best category and **Hershey (HSY)** a top pick last year did very well though **Mondelez (MDLZ)** the preferred best-in-class name this year. **Lamb Weston (LW)** is a lower margin name but screens as the best forward growth name. Lastly, **JM Smucker (SJM)** is the best value/growth combo while offering above industry-average margins. There is a group of solid growth names in SMPL, BRBR, TWNK each near a $3.5B market cap and of these, **Simply Good Foods (SMPL)** remains the favorite despite modestly higher valuation benefiting from active nutrition secular tailwinds, improving mobility, distribution growth, and innovation. **FreshPet (FRPT)** is a likely M&A target in a consolidating industry and is an activist campaign.

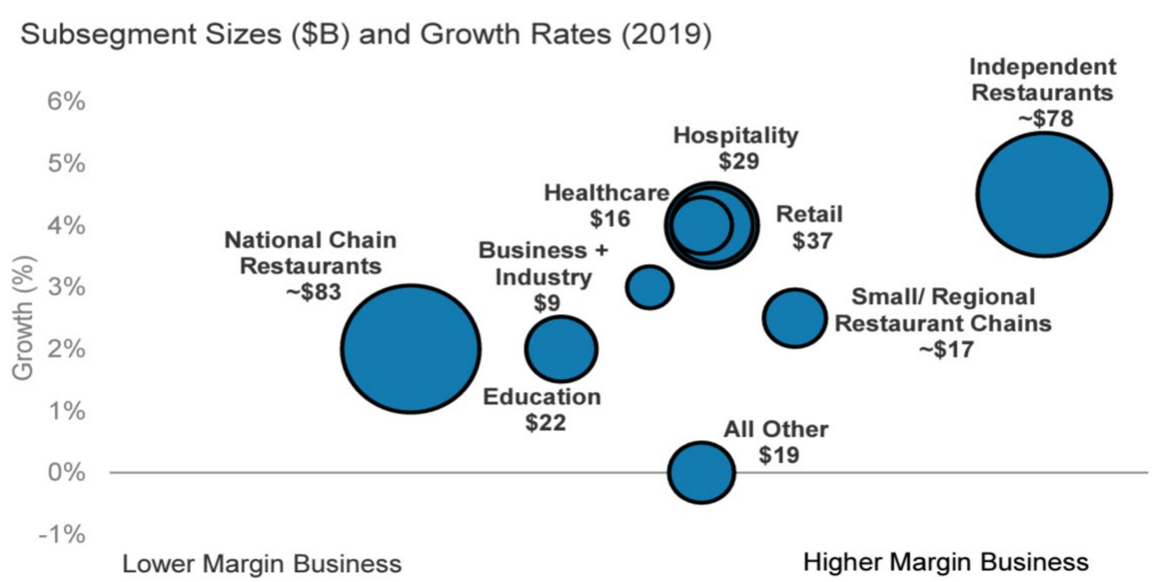
Food & Beverage – Distributors

Components: SYY, ARMK, PFGC, USFD, CHEF, SPTN

International & Private Peers: Sodexo, Compass, Elior, ISS

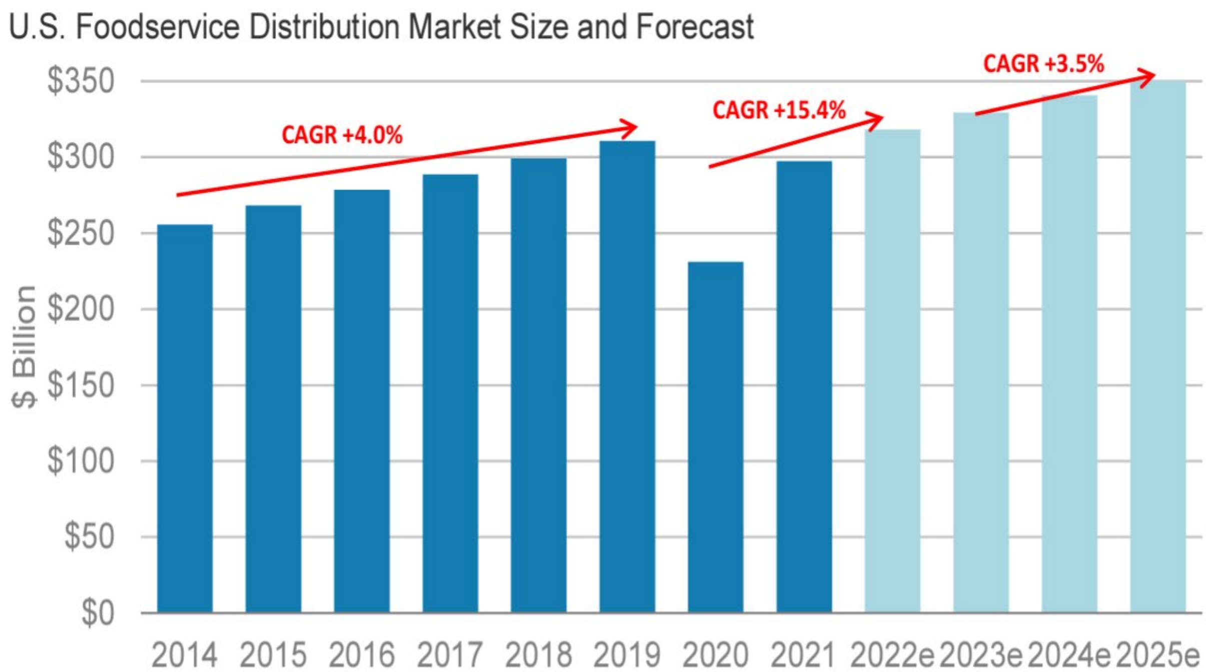
Intro

Food Distributors had a strong 2022 with reopening tailwinds and likely face a more normalized environment in 2023, but remains a healthy industry. The education and healthcare end markets are typically not sensitive to a downturn. Travel/hospitality and business/industry are more sensitive but also still below 2019 levels and in the process of recovering. US Foodservice inflation, while easing sequentially, was still up 12% last quarter, a tailwind for these names that could start to reverse later in 2023. Foodservice names continue to win market share but are facing higher operating costs.



Industry Backdrop & Investment Considerations

The US foodservice distribution channel is a roughly $330B market according to Technomic. Over the last decade US foodservice distribution has grown at a roughly 3.3% CAGR benefitting from favorable macro tailwinds as well as cultural and demographic shifts that have changed the way Americans consume food. As a result of increasing urbanization, a rise in single-person households and more dual-income families, lifestyles have become busier, requiring more convenient foods and precipitating a greater reliance on the foodservice channel. A food service distributor is a company that provides food and non-food products to restaurants, cafeterias, industrial caterers, hospitals and nursing homes. It is a fragmented market with the top three players accounting for 1/3 of the market.



Longer-term opportunities exist to 1) continue to increase penetration of captive brands;2) cut costs by making due with fewer but more tenured sales people, warehouse personnel, and drivers; and 3) better use technology to automate selling, product pricing, and warehouse operations. Efforts to digitize this business are at a surprisingly nascent stage.

Indicators, Metrics & Stock Selection Framework

EBIT Margins, ROIC,

While case growth (cases of product shipped, the industry volume measure) is the preferred top-line metric returns and balance sheet productivity are equally important metrics.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Food Distributors							#VALUE!	
SYY	SYSCO Corporation	41.7B	12.96X	4.21%	9.53%	3.84%	5.22%	6.76%
ARMK	Aramark	10.6B	11.26X	6.28%	13.76%	4.78%	3.28%	1.98%
PFGC	Performance Food Group Co	9.3B	10.32X	4.72%	10.1%	0.64%	#VALUE!	6.41%
USFD	US Foods Holding Corp	7.9B	10.24X	4.58%	8.51%	3.5%	5.98%	4.76%
CHEF	Chefs' Warehouse Inc	1.3B	10.45X	2.07%	10.23%	0.93%	#VALUE!	
SPTN	SpartanNash Co	1.1B	6.79X	1.93%	3.95%	1.07%	#VALUE!	2.74%

Management Commentary

Sysco (SYY) on share gains, end-markets and resilient industry….“Beginning with the Foodservice industry, the total addressable market is approximately $350 billion. Sysco grew 17% and the rest of the market grew 12% in the quarter, a strong start to the fiscal year. Restaurants continued to be resilient and our travel hospitality, plus our business and industry segments of our business posted year-on-year improvements. We see continued strength coming as tailwinds in the noncommercial sector should continue. We are closely monitoring macroeconomic conditions for signs of a business slowdown. At this time, we are not seeing recession concerns negatively impacting our business outcomes. Our key takeaways from today reflect 3 points. We advanced our Recipe for Growth strategy, and we are on target to grow more than 1.35x the market in a growing U.S. market. Our financial results this quarter reflected double-digit top and bottom line growth in the backdrop of a large industry that has proven resilient during very challenging macro conditions. Sysco is taking share profitably in a growing industry.”

Performance Food (PFGC) on market share wins and end-market momentum…. “In Foodservice, we continue to pick up market share in independent restaurants while showing operational improvement, 2 factors in our strong profit performance. Vistar's underlying momentum was further boosted by the recovery in many of their channels, providing profit growth that exceeded our prior announced expectations. Finally, our Convenience business remains robust with additional business wins in the food, foodservice and related products area. We have now owned Core-Mark for a little over a year, and the results are better than we had expected when we announced the transaction. For independent restaurants, we are focused on adding new accounts. As we discussed last quarter, penetration within accounts has slowed as higher inflation has impacted foot traffic. However, our ability to grow new accounts was a key factor in our organic case increase and bodes well for the future when foot traffic begins to reaccelerate. Our non-nicotine portfolio grew sales at a high teens rate in the quarter, offsetting the low single-digit decline in nicotine product sales. The mix shift to higher-margin food and foodservice-related product categories continues to drive both growth and adjusted EBITDA margin improvement in the segment. In addition, our cost synergy capture remains on schedule. We are excited about the prospects at Core-Mark and expect continued business wins to drive value from this transaction.”

OptionsHawk Executive Summary & Focus Stocks

The group continues to face FX pressures and cost headwinds, but sales trends are improving, and companies are seeing improved execution. The large caps all trade near the same multiple though **Aramark (ARMK)** screens best on growth and margins while delivering solid FCF. I would also highlight **Performance Foods (PFGC)** as a consistent excellent operator and **Spartan (SPTN)** trades very cheap on valuation and is a possible M&A target.

Food & Beverage – Tobacco & Cannabis

Components: PM, BTI, MO, RLX, TLRY, VGR, CRON, CGC, UVV, SNDL, ACB, TPB

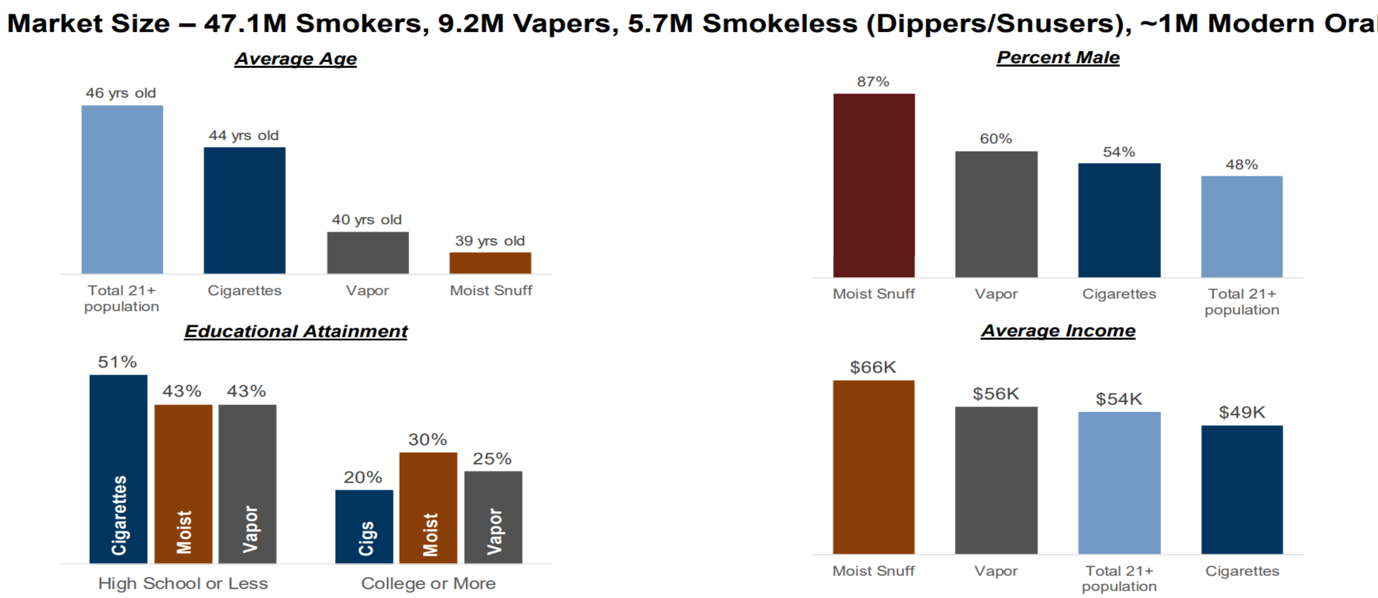
International & Private Peers: Imperial Brands, Japan Tobacco, British Tobacco, Swedish Match

Intro

There are a limited number of tobacco stocks and results continue to exceed estimates driven by strong pricing and improved sales mix. PM's $2.7B payment to MO to regain control of IQOS US distribution alleviates the overhang stemming from the companies' dispute and offers visibility around IQOS's reentry into the US market in 2024. PM's combustibles business experienced notable strength, defying concerns around its vulnerability to consumer trade down as industry volumes continuing to benefit from a post-Covid recovery.

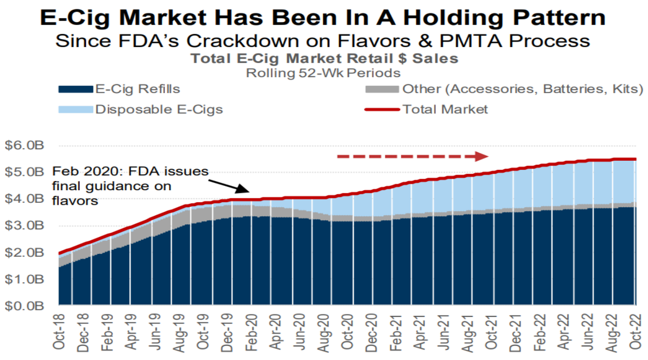
Industry Backdrop & Investment Considerations

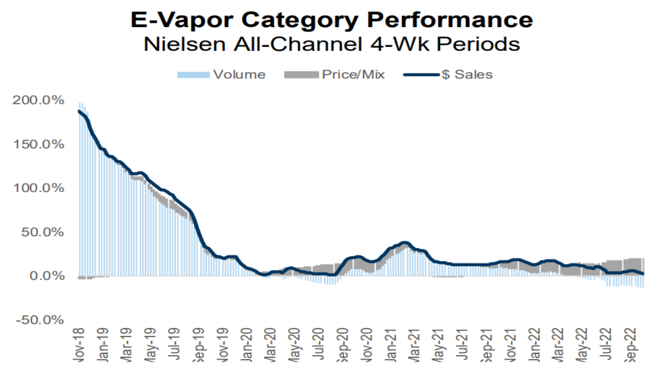
The most recent estimates for the legal global tobacco market indicate that sales are worth approximately $485B. More than $385B of this comes from the sale of conventional cigarettes, with over 5,300 billion cigarettes consumed per year by over 19% of the world's population. A contributing factor to the decline of legal tobacco volumes is the continued rise in the consumption of illicit products. The THP and vapor markets are relatively nascent.



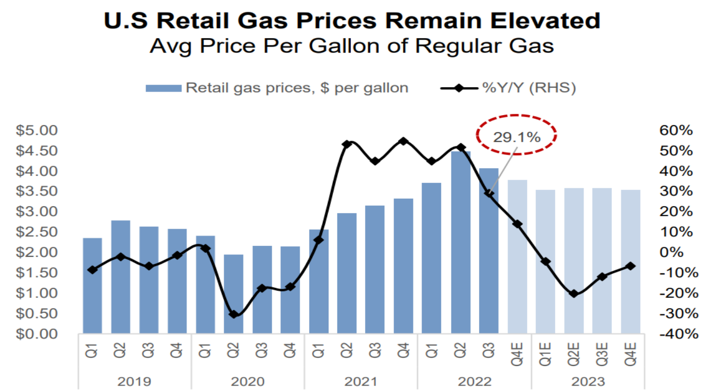
While combustible cigarettes remain the largest global tobacco category, their volumes have seen a gradual fall over many years driven by increased regulation and changing societal attitudes. Underpinned by a strong platform of product innovations, new use occasions, and, on average, higher revenue per consumer for reduced-risk products, the global nicotine revenue pool is expected to grow at a 5.2% CAGR through to 2025 vs. 3.1% through 2007-2019. Volume decline in combustibles is inevitable and likely to accelerate as reduced-risk products gain traction and cannibalize volume from combustibles.

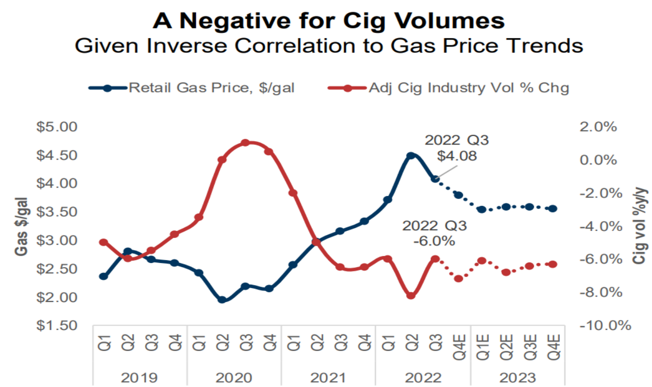
Growth of the global nicotine pool is accelerating, driven by innovation and brand development in Next Generation Products. Underpinned by a strong platform of product innovations, new use occasions, and, on average, higher revenue per consumer for reduced-risk products, the global nicotine revenue pool is expected to grow at a 5.2% CAGR through to 2025 vs. 3.1% through 2007-2019. Approximately 90% of cigarette sales are via the convenience store channel.





Higher gas prices, rising inflation, expiring stimulus, and aggressive discount segment pricing enhance the risk of down-trading within cigarettes. Pricing has been the one thing cigarette companies have relied on to offset volume declines, so with that in jeopardy it could spark issues.





Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Growth, EBITDA Margins, FCF Yield

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Tobacco & Cannabis							#VALUE!	
PM	Philip Morris International Inc.	158.3B	13.44X	9.74%	12.18%	42.95%	#VALUE!	14.85%
BTI	British American Tobacco PLC (ADR)	90.7B	8.23X	4.98%	6.59%	43.41%	#VALUE!	2.58%
MO	Altria Group Inc	83.7B	8.66X	0.2%	0.14%	55.9%	#VALUE!	8.24%
RLX	RLX Technology Inc - ADR	4.2B	11.15X	39.31%	91.92%	29.6%	#VALUE!	43.15%
TLRY	Tilray Inc	2.1B	31.54X	11.56%	47.45%	(97.14%)	157.76%	(9.189%)
VGR	Vector Group Ltd	1.7B	7.71X	(0.889%)	6.71%	27.18%	12.09%	(13.716%)
CRON	Cronos Group Inc	1.1B	-2.40X	18.87%		(753.132%)	#VALUE!	
CGC	Canopy Growth Corp	1.4B		7.91%	(44.863%)	(143.909%)	#VALUE!	(7.091%)
UVV	Universal Corp	1.3B				8.52%	#VALUE!	2.16%
SNDL	SNDL Inc	0.6B	521.09X	7.92%		(235.41%)	#VALUE!	(44.837%)
ACB	Aurora Cannabis Inc	0.3B	-31.18X	42.31%		(104.568%)	-2053.28%	(140.94%)
TPB	Turning Point Brands Inc	0.4B	7.31X	3.22%	8.68%	22.76%	#VALUE!	15.83%

Management Commentary

Phillip Morris (PM) on its transactions repositioning the company…. "We have ambitious plans for the full scale launch and rapid expansion of IQOS in the U.S. market, as soon as we take over an efficient time during the transition period to put our commercial model and related organization and infrastructure in place using our wealth of experience from international markets. We see IQOS as the primary vector for establishing a leadership position in the U.S. smoke-free industry, and it will be followed by the other product in our smoke-free portfolio. In this context, Swedish Match offers an immediate position in the oral segment and mutually beneficial synergy at sales force level. Cigarette shipment volume was essentially stable and category share grew supported by Marlboro, showcasing the resilience of the brand despite current economic conditions. IQOS is the world's leading smoke-free product with remarkable and rapid growth achieved across a wide range of international markets. From a standing start in 2015, IQOS is already $9 billion annual net revenue business having created the attractive heat-not-burn category and driving its growth. The U.S. is the world's biggest accessible nicotine market by retail value. The estimated retail value of its growing smoke market is already around 60% of all international markets combined, excluding China. We estimate the total U.S. industry profit pool at over $20 billion. And with average unit margin on U.S. cigarettes more than 3x greater than for the PMI average, the payback over the next few years on the consideration paid to Altria looks very attractive. "

OptionsHawk Executive Summary & Focus Stocks

Phillip Morris (PM) screens very attractive versus CPG peers at 13.45X EBITDA while seen growing EBITDA double digits and innovation continues make PM an interesting story moving forward including launching IQOS in the US in spring 2024. **RLX Tech (RLX)** screens attractive across all metrics but falls into the category of hard-to-trust Chinese stocks. **Vector (VGR)** and **Turning Point (TPB)** both fit the mold of potential M&A targets with the latter a bit more attractive as a small cap own.

Home Goods – Home & Office

Resources: Furniture Today, ISPA

Components: WHR, NWL, TPX, LEG, YETI, HELE, XRX, MLKN, HNI, LZB, SCS, SNBR, EBF, NPK, ACCO, COOK, DTC, LOVE, TUP, PRPL

International & Private Peers: Electrolux, Bosch-Siemens, LG Electronics, Haier, Haworth, Okamura, Kokuyo, Samsung, Consul, Brastemp, Fischer, Panasonic, Sub-Zero, IKEA, Okamura, Haworth, Kokuyo

Intro

We have the kitchenware and appliances names like TUP, YETI, HELE, WHR, HBB, NPK, NWL, WEBR, COOK; then we have the mattress/furniture names TPX, SNBR, PRPL, LOVE, LZB; lastly the office furniture/supply plays LEG, KBAL, KNL, MLHR, HNI, SCS, XRX, EBF, ACCO.

The year and a half following the onset of the pandemic saw elevated bedding demand, with US-produced mattress sales in 2020 up 20% compared to the prior 10-year average. This came as consumers devoted a larger portion of their wallets to home furnishings, including Covid-related stimulus. As a result, manufacturers were more than able to offset input cost inflation with pricing. However, demand began to soften towards the end of 2021 as inflation, higher interest rates, and an increasingly uncertain macro backdrop began to weigh on consumer sentiment. This has persisted through the summer, as Tempur Sealy mgmt estimates industry shipments fell 20-25% YOY, the greatest decline in 15 years.

Industry Backdrop & Investment Considerations

The global household cooking appliance market size was valued at $260B in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 6.5% from 2021 to 2028.

The global bedroom furniture market size was valued at $220B in 2019 and is expected to grow at a compound annual growth rate (CAGR) of 4.5% from 2020 to 2027. The global mattress market size was valued at $27.5B billion in 2018 and is expected to expand with a CAGR of 6.7% from 2019 to 2025. Furniture expenditures are expected to grow 3.4% per year through 2021, while online furniture expenditures are expected to grow from $36.0B in 2017 to $62.5B in 2021. In 2020, the office furniture industry exceeded the value of $71B and is seen growing at a 5.2% CAGR through 2025 reaching $84B. In 2019, office furniture accounted for around 15.9% of global furniture market. From 2010-2019, the industry shipped an average of 23M mattresses per year at a 2% CAGR. The average unit price over this time grew 3%/year. In sum, shipment dollars rose at a 5% CAGR during the decade. The mattress industry is highly promotional and peers could try to gain share on price, quality, brand name recognition, product availability, and performance across a range of distribution channels. Among the key inputs to bedding products are petroleum-based and steel components as well as textiles and lumber.

Like most industries the ecommerce channel is seeing increasing importance, eco-friendly materials design in demand, and millennials driving the demand. The industry clearly has strong correlations with consumer spending and a lot of it driven by home-goods.

Indicators, Metrics & Stock Selection Framework

Small Business Optimism, Office Construction Spending, CEO Confidence Index

EV/EBITDA, EBITDA Margins, Revenue Growth, ROIC

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Home & Office							#VALUE!	
WHR	Whirlpool Corporation	7.8B	5.83X	(0.427%)	4.49%	10.82%	11.91%	20.0%
NWL	Newell Brands Inc	5.6B	8.91X	2.22%	5.15%	11.02%	2.23%	4.47%
TPX	Tempur Sealy International Inc	5.5B	9.29X	4.38%	10.81%	19.21%	5.87%	28.49%
LEG	Leggett & Platt Inc	4.7B	9.68X	4.44%	2.99%	11.19%	#VALUE!	4.86%
YETI	Yeti Holdings Inc	3.9B	12.32X	11.77%	13.11%	20.92%	0.99%	92.1%
XRX	Xerox Holdings Corp	2.5B	11.44X	(0.962%)	(7.217%)	5.33%	#VALUE!	1.71%
HELE	Helen of Troy Limited	2.4B	10.59X	3.32%	10.26%	15.97%	-0.79%	16.75%
MLKN	MillerKnoll Inc	1.4B	8.12X	3.25%	(3.535%)	5.72%	#VALUE!	4.99%
HNI	HNI Corp	1.1B		5.69%	39.5%	5.47%	#VALUE!	3.65%
LZB	La-Z-Boy Incorporated	1.0B	3.48X	(3.56%)	(4.441%)	8.09%	#VALUE!	23.38%
SCS	Steelcase Inc.	0.8B	8.41X	1.13%	29.79%	0.72%	7.57%	(5.614%)
SNBR	Sleep Number Corp	0.6B	7.19X	4.42%	5.9%	8.86%	#VALUE!	(46.905%)
EBF	Ennis Inc	0.6B				10.9%	7.93%	1.61%
ACCO	ACCO Brands Corp	0.5B	6.64X	1.35%	8.36%	11.25%	16.81%	6.09%
NPK	National Presto Industries Inc.	0.5B				8.63%	#VALUE!	
PRPL	Purple Innovation Inc	0.5B	99.10X	16.99%	48.14%	######	-13.87%	71.57%
DTC	Solo Brands Inc	0.4B	10.62X	13.13%	11.06%	29.81%	#VALUE!	25.17%
COOK	Traeger Inc	0.4B	24.57X	11.87%	144.19%	7.29%	#VALUE!	7.13%
LOVE	Lovesac Co	0.3B	5.40X	12.0%	36.04%	7.72%	-2.07%	98.25%
TUP	Tupperware Brands Corporation	0.2B		4.31%	5.52%	15.7%	-17.85%	86.21%

Management Commentary

Whirlpool (WHR) on the cycle… "Beyond the current recessionary challenges, we strongly believe in the favorable mid- and long-term demand tailwinds in particular in North America. And our business is very well positioned to win in this attractive post-recession setup. As expected, inflation peaked in the quarter and will remain elevated. We do expect cost inflation to persist throughout the first half of 2023 and costs moderating in the second half of 2023. Looking forward, we are excited about the unique opportunity to add in InSinkErator to our portfolio of leading brands and expect the transaction to close on October 31. And this acquisition is a clear accelerator of our ongoing portfolio transformation and delivering on our commitment of investing in high-growth, high-margin businesses. While we are experiencing short-term demand softness, we're at the same time very optimistic about the mid- and long-term demand trends, in particular in North America. Let me start by giving you a more detailed perspective on the U.S. appliance demand. As discussed in previous earnings calls, it has 2 fundamental components: Replacement demand, which currently represents 55% of our total market; and the discretionary demand. With the trough of a 2008 to 2011 replacement cycle now behind us, replacement demand has been very stable and even growing. And we do expect further momentum on the replacement side of the demand due to a significantly increased appliance usage over past years, as evidenced in the data which we see from our connected appliances. We do expect home price appreciation to slow down and housing inventory to slowly improve to more historic levels. And ultimately, existing home sales will turn back to historical averages of above 6 million units per year. New housing contributes approximately 15% of appliance demand in the U.S. New housing construction has significantly lagged historical averages for more than a decade."

Tempur Sealy (TPX) on premium products and customer impacts…. "Investing in premium price points positions us well in the current macro environment as we see resilience in premium demand in the face of economic uncertainty. Additionally, looking at historical industry performance, premium bedding sales growth has outpaced other price points since 2015. Sales of mattresses above 2,000 have been growing 7x faster than the overall category. We continue to see an impact on the U.S. consumers' behavior for macroeconomic pressures, particularly from strong inflation and a sense of near-term economic uncertainty. These factors are disproportionately impacting certain segments of the market. We continue to reserve more resiliency with our premium customers while the value-focused customer is more subdued. Our historical data indicates that consumer confidence and consumer sentiment correlate to bedding demand. Our research also indicates that the number 1 reason consumers want to purchase new mattress is to improve their sleep, while only 10% of purchase decisions are made in relation to a housing event."

OptionsHawk Executive Summary & Focus Stocks

This group lacks any large cap names and **Whirlpool (WHR)** is the largest and trades very cheap with strong FCF, but the growth outlook remains troubling with correlations to a weakening housing backdrop. **Tempur Pedic (TPX)** and **Yeti (YETI)** are far and away the strongest financially sound names in the group from a growth and margin perspective while valuations are not excessive. **Solo Brands (DTC)** is an interesting name at 10.5X EBITDA with industry-leading margins and a double-digit growth outlook while **LoveSac (LOVE)** screens incredibly cheap at 5.4X EBITDA for a strong growth name albeit with low margins.

Home Goods – Household & Personal Care (HPC)

Components: PG, UL, EL, CL, KMB, CHD, CLX, REYN, COTY, PRGO, NTCO, OLPX, PBH, IPAR, HLF, ELF, EPC, NUS, SPB, DSEY, SBH, MED, USNA, HIMS, YSG, HNST

International & Private Peers: L'Oreal, Beiersdorf, Unilever, Henkel, Reckitt Benckiser, Essity, Shiseido, Bayer, Ontex, Orkla

Intro

The four key sectors within HPC are Beauty & Personal Care (45% of industry sales), Consumer Health (24% of HPC), Tissue & Hygiene (16%) and Home Care (14%). Many of the same factors are in play for this group such as consumer trade-down, rising input costs and supply chain challenges.

Industry Backdrop & Investment Considerations

The global Beauty & Care market is estimated at $500B and growing at a 4.8% CAGR. Skin care has been one of the fastest growing segments, a $181B market. Fragrances is an estimated $47B market. Premiumization continues to be a secular trend in Consumer Staples, particularly within the Beauty category.

Consumer Health is a market dealing with wellness and nutrition and mainly sold OTC and includes supplements and many Pharma companies have segments in this space. The Consumer Health market is estimated at $330B and seen growing at an 8.5% CAGR through 2028 reaching $665B.

Hygiene Products is a $140B market growing at a 5.5% CAGR. Hygiene Products Market is segmented into Oral Care, Hand Care, Face Care, Body Care, Women's Care, and Baby Care. The global Tissue paper market is a $70B market seen growing at a 5.9% CAGR through 2026. The global Home Care market is estimated at $95B and seen growing at a 3.5% CAGR.

The top growth trends in consumer personal care are Male Grooming, Food for Skin Products, Natural/Organic Products, and Hand-Crafted Products. As Millennials assume greater wallet share, their preferences increasingly dictate innovation, driving a shift across many categories toward convenience or natural alternatives (e.g., eco-friendly diapers, paraben/phthalate-free personal care, single-dose laundry pods, cleaning wipes vs sprays). Moreover, technology advancements allow lower barriers to entry and broader reach, enabling direct-to-consumer brands to gain share (i.e., in razors, pet food) and heightening the need to deliver on-trend, convenient and frequent innovation. The primary driving force to the global personal care market is rising disposable income. Private label (PL) penetration varies markedly across sectors and geographies.

Other key debates center around Pricing Power vs. Inflation; Private Label Threat; Rising Local Competition; Shift to E-Commerce/DTC Sales at Higher Margins; and Emerging Market Demand.

Indicators, Metrics & Stock Selection Framework

Organic Growth, EBIT Margins, EPS Growth, P/E, EV/EBITDA, FCF Yield, Debt to EBITDA, ROIC

Valuation & Comps

EV/EBITDA vs Organic Sales Growth

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Household, Personal Care								
PG	Procter & Gamble Co	357.6B	18.53X	3.65%	6.31%	22.21%	3.45%	10.12%
UL	Unilever plc (ADR)	127.9B	14.52X	4.34%	7.12%	18.37%	#VALUE!	6.09%
EL	Estee Lauder Companies Inc	90.0B	27.24X	9.95%	18.82%	19.73%	1.53%	26.24%
CL	Colgate-Palmolive Company	65.0B	17.00X	4.25%	6.64%	22.25%	3.41%	16.98%
KMB	Kimberly Clark Corp	46.0B	15.99X	2.54%	5.77%	14.59%	3.75%	6.34%
CHD	Church & Dwight Co., Inc.	19.5B	17.55X	3.73%	4.01%	18.9%	3.49%	10.17%
CLX	Clorox Co	18.4B	20.16X	3.04%	15.04%	11.41%	3.37%	2.74%
COTY	Coty Inc	6.7B	11.72X	5.37%	8.64%	11.6%	6.46%	
REYN	Reynolds Consumer Products Inc	6.6B	15.31X	1.85%	5.73%	13.84%	#VALUE!	3.95%
PRGO	Perrigo Company PLC	4.2B	13.06X	3.86%	11.09%	11.57%	#VALUE!	0.55%
OLPX	Olaplex Holdings Inc	3.6B	9.26X	12.26%	13.78%	68.45%	#VALUE!	23.05%
IPAR	Inter Parfums, Inc.	3.1B	17.44X	10.12%	16.91%	16.83%	-1.83%	11.71%
NTCO	Natura & Co Holding SA	3.0B	11.18X	7.37%	19.85%	2.78%	#VALUE!	2.42%
PBH	Prestige Consumer Healthcare Inc	3.0B	11.64X	2.23%	5.35%	30.36%	8.49%	7.05%
ELF	elf Beauty Inc	2.8B	29.41X	10.72%	15.64%	15.39%	1.97%	12.84%
SPB	Spectrum Brands Holdings Inc	2.4B	17.06X	3.29%	7.84%	6.39%	#VALUE!	(8.215%)
EPC	Edgewell Personal Care Co	2.1B	10.15X	2.37%	4.36%	10.6%	6.49%	4.2%
NUS	Nu Skin Enterprises, Inc.	2.0B	8.31X	2.95%	6.65%	10.85%	3.88%	15.25%
DSEY	Diversey Holdings Ltd	1.6B	10.13X	4.41%	22.12%	12.19%	#VALUE!	5.84%
HIMS	Hims & Hers Health Inc	1.5B	-67.45X	23.22%	99.4%	(37.356%)	-362.81%	
MED	Medifast Inc	1.3B	5.89X	0.0%	0.42%	14.17%	7.87%	210.95%
HLF	Herbalife Nutrition Ltd	1.2B	5.17X	4.78%	16.03%	13.28%	#VALUE!	79.91%
SBH	Sally Beauty Holdings Inc	1.2B	5.10X	1.5%	2.63%	10.25%	14.80%	18.04%
USNA	USANA Health Sciences, Inc.	1.0B	6.07X	2.99%	7.01%	15.55%	4.67%	90.52%
YSG	Yatsen Holding Ltd - ADR	0.8B	-5.77X	11.62%		(18.018%)	#VALUE!	(53.617%)
HNST	Honest Company Inc	0.3B	-10.65X	6.17%		(11.557%)	-12.58%	(61.75%)

Management Commentary

P&G (PG) on consumer trends…. " In terms of consumer sentiment, in general, we see part of the consumer base in Fabric Care, for example, trending up, as I mentioned, into single-unit dose. We see some growth also in our mid-tier brands. As consumers are looking for value within our portfolio, they're trading into Gain or into Simply Tide (sic) [Tide Simply], for example, where we see some level of share growth. And that's the intent of our vertical portfolio and our strategy to provide different value tiers to consumers. We are also seeing consumers moving to different price points. So a group of consumers is looking for value by trading into higher-transaction sizes to find lower cost per use or lower cost per unit. And we see other consumers who are more cash conscious, and they are very focused on cash outlay. So again, the other part of the strategy, to provide pack sizes that stretch from below $10 for some channels and consumers to above $30 or $40 for others, seems to be meeting consumers' needs."

Estee Lauder (EL) on China/Europe…. "So the phenomenon that is historically proven, that beauty prestige industry grows, on average, more than the economy, and then we grow on average more than the beauty industry is, that trend is what we believe will continue to happen in the future. And it's happening as we speak. However, the traffic movements are very different. But on the other side, there is more consumption online. There is more growth online. There is people that are going through channels. So in total, we have seen, as I said before, a mid-single-digit growth even in this tough situation with reduced traffic levels. So when the traffic will recover in brick-and-mortar, both in travel and in domestic, when this will happen, the retail should further improve, further increase and be pretty positive. And so we are now looking at fiscal '24 for traffic to recover. And again, it's a guesstimate at this point in time. And so we have seen strong growth in Europe, particularly in emerging markets in Europe. We are seeing makeup recover. We're seeing strong fragrance growth. And the one category that has been a bit slower really in all of our markets has been skin care, but we've got strong innovation in the second half of the year and certainly into fiscal '24 that we believe will accelerate our skin care growth."

OptionsHawk Executive Summary & Focus Stocks

P&G (PG) is a consistent best-in-class name that continues to drive solid organic growth and strong FCF. **Estee Lauder (EL)** remains pricey on valuation though the top growth name among the large caps and the top ROIC name. EL could see strong 2023 tailwinds from China reopening and be a rising estimates name. In the $3B to $7B market cap tier, **Inter Parfums (IPAR)** screens as an attractive growth name with fundamentals strong in the fragrance category. **Prestige (PBH)** is a strong performer with high margins that makes sense as an M&A target. **Elf beauty (ELF)** has long been a favorite and put in an incredible 2022 while still benefiting from trade-down and providing well above industry-average growth.

Home Goods – Apparel & Footwear

Components: NKE, LULU, VFC, DCK, TPR, RL, CPRI, LEVI, GIL, ONON, SKX, COLM, CROX, PVH, UA, UAA, CRI, ZGN, HBI, GOOS, SHOO, KTB, WRBY, OXM, WWW, FIGS, GIII, CURV, BIRD, CLAR, FOSL

International & Private Peers: LVMH, Hermes, Kering, Richemont, Adidas, Christian Dior, Inditex, Fast Retailing, Burberry, Prada, Hermes, Puma, Anta, Moncler, Boss, ASICS

Intro

This group can mostly be divided into Athletic Apparel, Luxury/Handbags, Footwear & Accessories and Work Apparel. The global apparel industry is segmented by type of apparel mainly into women's wear, men's wear, and kid's wear. Top of mind for investors is elevated levels of promotional & discounting activity with Y/Y consumer demand deceleration. Softline's have historically proven early-cycle winners will require a combination of sufficiently low stock prices, multiple quarters of negative EPS revisions, & generally some signal of monetary and/or fiscal policy support to the economy for the group to bottom. Margins in 2023 may improve on healthier inventory, subsequently lower promotional/discounting levels, & normalizing freight expense.

Industry Backdrop & Investment Considerations

The global textile market size was valued at $960B billion in 2019 and is estimated to exhibit a CAGR of 4.3% from 2020 to 2027 owing to the increased demand for apparels, especially in developing countries such as China, India, Mexico, and Bangladesh. The global footwear market size was valued at $365.5B in 2020 and is estimated to reach $530.3B by 2027 with a CAGR of 5.5% from 2020 to 2027. Rising per capita income, favorable demographics and a shift in preference to branded products is projected to drive the demand for the market. The global activewear industry is expected to reach nearly $547B by 2024, seen growing at an 11% CAGR 2020-2024. Online penetration continues to rise across apparel/footwear and growing at a much faster rate.

Indicators, Metrics & Stock Selection Framework

P/E, Price/Sales, Margins, Inventory Turnover

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Apparel & Footwear							#VALUE!	
NKE	Nike Inc	171.2B	26.89X	8.15%	21.1%	14.29%	2.13%	29.28%
LULU	Lululemon Athletica Inc	43.3B	21.02X	13.86%	13.15%	21.97%	1.03%	70.31%
VFC	VF Corp	11.0B	11.64X	4.84%	10.64%	12.29%	2.38%	4.35%
TPR	Tapestry Inc	8.8B	7.41X	4.79%	8.06%	18.23%	8.21%	22.27%
CPRI	Capri Holdings Ltd	7.3B	7.10X	5.27%	5.05%	18.98%	11.05%	
RL	Ralph Lauren Corp	7.1B	7.28X	4.64%	8.06%	13.36%	5.39%	18.02%
SKX	Skechers USA Inc	6.6B	9.46X	10.57%	14.0%	10.47%	2.17%	36.0%
LEVI	Levi Strauss & Co	6.5B	7.82X	5.89%	9.43%	12.37%	-0.34%	30.79%
CROX	Crocs, Inc.	5.9B	8.47X	10.33%	8.16%	30.05%	5.17%	116.82%
ONON	On Holding AG	5.5B	35.84X	31.42%	48.47%	(19.472%)	-8.09%	(61.444%)
COLM	Columbia Sportswear Company	5.4B	9.86X	5.05%	11.89%	14.41%	-0.19%	25.18%
GIL	Gildan Activewear Inc (USA)	5.2B	7.85X	6.58%	3.42%	20.24%	7.29%	19.48%
PVH	PVH Corp	4.7B	5.81X	2.66%	4.65%	10.74%	1.59%	11.13%
UA	Under Armour Inc	4.0B		5.45%	16.32%	7.4%	#VALUE!	45.89%
UAA	Under Armour Inc	4.0B	8.59X	5.45%	16.32%	7.4%	0.28%	45.89%
CRI	Carter's, Inc.	2.7B	7.80X	1.87%	2.41%	14.36%	#VALUE!	31.22%
ZGN	Ermenegildo Zegna NV	2.6B	8.50X	7.5%	12.11%	(4.475%)	#VALUE!	(5.011%)
SHOO	Steven Madden, Ltd.	2.6B	7.92X	4.11%	5.17%	13.05%	7.35%	25.24%
KTB	Kontoor Brands Inc	2.3B	8.26X	2.94%	2.53%	14.22%	5.00%	20.99%
HBI	Hanesbrands Inc.	2.2B	8.65X	2.64%	18.53%	13.67%	-25.67%	25.26%
GOOS	Canada Goose Holdings Inc	1.9B	10.43X	13.86%	14.94%	15.9%	#VALUE!	15.25%
WRBY	Warby Parker Inc	1.9B	65.20X	19.02%	56.4%	0.54%	-2.65%	14.96%
OXM	Oxford Industries Inc	1.6B	5.13X	13.99%	3.68%	15.27%	13.45%	26.65%
FIGS	Figs Inc	1.2B	13.44X	17.73%	21.29%	18.42%	-0.68%	124.55%
WWW	Wolverine World Wide, Inc.	0.8B	9.55X	5.46%	20.97%	10.64%	-25.29%	13.08%
GIII	G-III Apparel Group, Ltd.	0.6B	5.16X	1.39%	6.76%	11.24%	#VALUE!	13.07%
BIRD	Allbirds Inc	0.5B	-7.12X	21.09%		(11.848%)	-19.71%	(54.576%)
CURV	Torrid Holdings Inc	0.3B	4.54X	2.07%	5.28%	12.45%	#VALUE!	333.0%
CLAR	Clarus Corp	0.3B	7.22X	11.51%	10.61%	16.37%	11.86%	13.77%
FOSL	Fossil Group Inc	0.2B				7.13%	#VALUE!	14.77%

Management Commentary

Tapestry (TPR) on AUR increasing…. "But across all brands, we drove AUR increases in the first quarter. This has been a consistent focus of ours, and that continues. We see more opportunity to drive AUR increases. Customers are recognizing the value we deliver across our brands. We still continue to see pricing power. As we think about the promotional environment, even in Q1, we're already seeing it intensify, but we are being disciplined in how we manage and respond. There are so many levers under our control, and we continue to drive healthy brand growth. We're delivering product innovation that supports sustained higher AUR. The second quarter is always promotional. We expect there will be promotions, but we also expect to be disciplined and as we go through the balance of the year to continue to drive AUR growth. There are a lot of dynamics that are playing out in the business. At the end of the day, our brands represent tremendous value in the marketplace from consumers, and we're seeing pricing power. And we intend to continue our focus on delivering innovation, leveraging data to understand our consumers even better. And we do see opportunity to continue to drive price and AUR through this year and as we deliver into the future, driving margin accretion as well."

Ralph Lauren (RL) on women's wear…. "Our core also establishes the credentials for driving our high potential categories, which include Women's, Outerwear and our emerging Home business. Together, these high potential categories grew high teens in the quarter. Women's represents our single-largest long-term opportunity for market share gains and category growth as a company. We are trading her into the brand, including the successful launch of our Polo ID handbag collection this year. We are trading here across by building an offering of essentials like sweaters, sophisticated coats, dresses and denim that will form the foundation of her wardrobe and expand her lifetime value. And we are trading her up to more elevated product through our hybrid styling as only Ralph can, with Women's AUR up 20% in the second quarter. Within Outerwear, another high potential category which now represents about 10% of sales, we are establishing our brand as a go-to player for the category."

OptionsHawk Executive Summary & Focus Stocks

Lululemon (LULU) remains the top name of this group trading at a steep discount to Nike despite better growth and margins. In the $5B to $8B market cap range valuations are all in the 7-9X EBITDA range with **Crocs (CROX)** the superior growth/margins name while **Capri (CPRI)** remains cheap at 7X EBITDA while having impressive growth and margins along with strong FCF. CPRI has a strong brand portfolio and continues to show superior execution. In the $2B to $4B market cap range, **Steve Madden (SHOO)** screens best and a name that would make a nice acquisition target. Among the sub $2B names, **Canada Goose (GOOS)** now at 10X EBITDA with double digit growth and well above industry-average margins looks attractive and **Clarus (CLAR)** a likely M&A target.

Home Goods – Consumer Electronics

Components: AAPL, SONY, CAJ, GRMN, VZIO, CRCT, ENR, SONO, VVNT, SNPO, GPRO, SMRT, VUZI, UEIC

International & Private Peers: Samsung, LG Electronics, Nikon, Philips, Panasonic, Huawei, Toshiba, Fujitsu, Dixon Technologies, Japan Display, Goodix

Intro

This is a diverse group that covers Phones, Batteries, Wearables, Audio Equipment, Display Technology, Gaming Systems, Cameras, Printers, and Smart-Home Products. Consumer electronics cover all the electronic devices most often used for entertainment communications and office work. Smartphones, personal computers, tablets, laptops, notebooks, radios, digital cameras, televisions, MP3 players, audio equipment, calculators, camcorders and personal care devices and gaming consoles are some of the major consumer electronics devices. The consumer electronics market is generally divided into TV, Radio & Multimedia, TV Peripheral, Drones, Phones and Computing.

Industry Backdrop & Investment Considerations

The consumer electronics market size is valued at more than $1 trillion and is estimated to grow at a CAGR of over 7% through 2026.The global wearable technology market size is valued at $78B and is projected to expand at a CAGR of 15.9% through 2027. The smartphone market was valued at $715B in 2020 and is expected to reach $1352B by 2025, at a CAGR of 11.2%. The global smart TV market is expected to grow at a 10% CAGR reaching $285B by 2025. The global market for Consumer Batteries is projected to reach $50B billion by 2025, driven by the growing indispensability of batteries in the digital era of laptops, smartphones, tablets, smart electronic wearables and digital cameras. The home audio equipment market is $25B with a forward CAGR of 5%. The global gaming console market is expected to reach $52B in 2027 at a 5.3% CAGR. The global digital photography market is expected to reach $49B by 2031 at a CAGR of 3.1%. The global printing is forecast to reach $821B by 2022, driven by growth in packaging and labels, rather than graphic applications, and digital rather than analogue printing. The global inkjet printer market is valued at $35B and expected to grow at a 5.3% CAGR through 2027. Smart-Home product revenues is a $27B market with a forward CAGR forecast at 15.8% as household penetration of 32% is expected to reach 57% by 2025.

Indicators, Metrics & Stock Selection Framework

P/E, Price/Sales, Margins, Inventory Turnover

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Consumer Electronics							#VALUE!	
AAPL	Apple Inc	2261498.21	16.96X	5.56%	4.29%	30.29%	4.84%	59.5%
SONY	Sony Group Corp (ADR)	98.9B	1051.21X	5.66%	6.21%	12.31%	0.08%	12.7%
CAJ	Canon Inc (ADR)	30.4B	7.12X	2.06%	0.55%	8.63%	#VALUE!	4.26%
GRMN	Garmin Ltd.	18.2B	13.12X	8.64%	17.38%	24.46%	#VALUE!	14.0%
VVNT	Vivint Smart Home Inc	2.5B	6.68X	10.83%	7.73%	(10.426%)	#VALUE!	(36.029%)
ENR	Energizer Holdings Inc	2.4B	9.67X	1.72%	2.12%	14.63%	13.60%	4.06%
SONO	Sonos Inc	2.3B	12.41X	8.76%	24.85%	5.11%	4.83%	62.8%
CRCT	Cricut Inc	2.0B	16.07X	7.27%	17.96%	14.73%	#VALUE!	52.11%
VZIO	Vizio Holding Corp	1.7B	27.87X	10.83%	67.26%	(1.394%)	#VALUE!	132.44%
GPRO	GoPro Inc	0.8B	6.74X	3.65%	40.71%	13.41%	#VALUE!	52.44%
SNPO	Snap One Holdings Corp	0.6B	9.64X	5.53%	18.38%	7.6%	#VALUE!	4.55%
SMRT	SmartRent Inc	0.5B	-4.13X	47.54%		(64.763%)	-14.18%	(770.482%)
UEIC	Universal Electronics Inc	0.3B	4.53X	13.14%	24.25%	9.8%	#VALUE!	20.94%
VUZI	Vuzix Corp	0.3B	-7.27X			(303.686%)	-10.41%	(225.836%)

Management Commentary

Garmin (GRMN) on new products…. "Ivan, I would say, generally, we're always looking at new category opportunities. So index has been a great category for us as a wellness device on the scale first, and the blood pressure monitor has been a delightful surprise in terms of the interest that we've had in that and we quickly sold out what we had on hand and looking for more deliveries. So we're excited about that, and we're constantly looking at new categories to grow our business."

OptionsHawk Executive Summary & Focus Stocks

Garmin (GRMN) stands out among the large aps with high margins and a strong forward EBITDA growth outlook as it works past tough comps in 2022 and continues to innovate with new products. Vivint (VVNT) was recently bought at a nice premium by NRG Energy and **GoPro (GPRO)** at 6X EBITDA with profitability ramping could make it an interesting acquisition target while Vizio (VZIO) has been rumored as a target. **Universal Electronics (UEIC)** is a very small name that screens incredibly cheap with solid margins and growth turning higher as it moved manufacturing to Mexico from China and has been introducing new products, a potential comeback story in 2023.

<u>Home Goods – Sporting Goods & Toys</u>

Resources: NICS Background Checks, Outdoor Industry Association

Components: AXON, HAS, MAT, GOLF, MODG, PTON, VSTO, CDRE, FNKO, RGR, SWBI, POWW, BODY

International & Private Peers: Icon Health & Fitness (NordicTrack), Echelon, Mirror (LULU), Strava, Zwift, Lego Group, Takara Tomy, Vtech, MGA Entertainment, Pop Mart, Bandai

Intro

It was an extremely rough year in 2022 for this group as a lot of the pent-up at home demand gave way to people shifting spending back to experiences. The weaker consumer backdrop in 2023 will likely remain challenging for many of these companies.

Industry Backdrop & Investment Considerations

The US outdoor recreation market is large estimated at a $100B TAM with the Shooting & Hunting market $16B. The Ammunition industry is estimated at $14B in Commercial/Retail and $18.5B in Military & Law Enforcement while Firearms is a $2.8B market for handguns and $2.3B for long guns, non-military.

The global market for fitness and wellness spending is estimated at $600B. Trends include growing awareness of health, work from home resulting in the need for home equipment and the surge in interactive home equipment with the connected fitness theme. The online fitness market is expected to grow from $6B in 2019 to $59B by 2027, representing a 33% CAGR.

The toy market is broad. The traditional market tends to categorize toys by their exterior appearance and formats, into plush, action figures, mobile vehicles, puzzles & games, construction, ball-jointed-dolls. A better way to break down the market in the new environment is between IP-based todays and non-IP based. The global toy market reached $94.7B in 2020 according to the NPD Group and has averaged a 2.7% CAGR but expected to reach $132B in 2028 at a 4.3% CAGR. The toy market is driven by disposable incomes and digital is also taking this industry by storm while partnerships with television/media are often an important sales driver for story-driven brands. The industry faces plenty of headwinds competing with technology for leisure time, a declining birth rate and the impact of inflation is felt strongly. The top ten manufacturers control over 40% of the global market.

Indicators, Metrics & Stock Selection Framework

P/E, EPS Growth, Revenue Growth, EBIT Margins

Google Trends can be useful in analyzing popularity of sales across consumer products as it is a product-cycle driven industry.

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	Rev. Growth 23-24	EBITDA CAGR (FY23 to FY25)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC
Sporting & Toys							#VALUE!	
AXON	Axon Enterprise Inc	12.0B	53.12X	17.06%	26.5%	15.66%	#VALUE!	22.08%
HAS	Hasbro, Inc.	8.2B	9.54X	5.52%	11.71%	15.5%	5.63%	5.54%
MAT	Mattel Inc	6.1B	7.90X	3.84%	4.15%	13.99%	6.86%	
MODG	Topgolf Callaway Brands Corp.	4.1B	9.18X	9.16%	13.25%	8.17%	-2.10%	5.03%
PTON	Peloton Interactive Inc	3.9B	-26.69X	9.71%		(66.598%)	-9.77%	(211.04%)
GOLF	Acushnet Holdings Corp	3.4B	11.28X	2.01%	2.48%	12.1%	2.09%	11.43%
VSTO	Vista Outdoor Inc	1.5B	4.48X	0.21%	(6.843%)	21.9%	20.73%	35.56%
RGR	Sturm Ruger & Company Inc	1.0B	6.14X			27.8%	#VALUE!	32.97%
CDRE	Cadre Holdings Inc	0.9B	13.06X	6.49%	(17.843%)	12.19%	3.98%	4.68%
FNKO	Funko Inc	0.5B	6.52X	6.52%	32.67%	10.56%	-5.30%	19.23%
SWBI	Smith & Wesson Brands Inc	0.4B	4.93X	7.83%	23.17%	30.38%	#VALUE!	79.61%
BODY	Beachbody Company Inc	0.3B	-5.63X	(1.445%)	1558.09%	(23.17%)	#VALUE!	(75.202%)
POWW	Ammo Inc	0.2B	3.97X	25.44%	27.61%	15.46%	8.38%	16.65%

Management Commentary

Axon Enterprise (AXON) on penetration…. "We believe the majority of TASER adoption remains in front of us. We're still under 10% penetrated in terms of our global TAM. And we're working on some really exciting technology over the next 10 years to help hit our goal. Number two, virtual reality. We're seeing a lot of interest in our VR training, which we sell on a subscription to customers. Number three, cameras and sensors that never miss a moment. Over the next few years, you're going to see us introduce next-generation body cameras, and we'll deepen the tie between our real-time operations and our devices, which brings me to #4, real-time and remote response. The public safety sector deserves public safety-grade communications tools that are as easy to use as consumer technology. They deserve better situational awareness and it will help them improve their decision-making and their ability to respond effectively. Also, we believe that remote response can limit human exposure to danger."

Topgolf Callaway (MODG) on its strong ecosystem…. "The strength of our results underscores our leadership position in the Modern Golf ecosystem and the positive trends we're seeing across our business highlighted by increased traffic at our Topgolf venues, market share gains in our golf equipment business and strong brand momentum in our Active Lifestyle segment. Over the long term, we believe we can deliver profitable growth across all of our segments as well as a competitive advantage via the scale, synergies of our combined enterprise. We remain confident that off-course golf will continue to be a key driver of growth in the Modern Golf ecosystem and as our recent rebrand suggests, Topgolf is expected to be an even larger contributor to both top line and bottom line growth. As you'll see in the outlook section, given Topgolf's strong embedded growth, we see that business contributing more than half of our EBITDA in the very near future, an impressive transformation that also demonstrates the long-term advantage of our diversified Modern Golf portfolio. According to Golf Datatech, the U.S. golf equipment market is down only 2.3% through Q3 on a sell-through dollar basis and remains up an impressive 41% compared to 2019. It's clear that interest in golf remains high and that Callaway is outperforming the market, something I believe we have a track record of doing. With all this, the profitability of our golf equipment business remains high as well."

OptionsHawk Executive Summary & Focus Stocks

Axon Enterprise (AXON) is a premium valuation name that continues to execute extremely well with a massive opportunity ahead, so I continue to prefer it in an otherwise ugly group. **Hasbro (HAS)** at 9.5X EBITDA with double-digit EBITDA growth seen ahead fits the value category trading at the low end of a decade-long valuation range. **Peloton (PTON)** is under new management and the most plausible outcome remains it being acquired. **TopGolf (MODG)** screens well and has been posting solid numbers and has seen insider buys.

Financials

There is not a lot of stock-specific analysis in this group as correlations are tight among the names that are tied closely to the Macro backdrop and the cross-asset correlations. It is a group filled with value traps and dividend yielding securities. The most exciting part of this group, and where I spend the most time investing, is across opportunities in Fin-Tech which includes financial software, analytics, payment processors, mobile payments, online lending, real estate services and financial information.

Banks – Foreign

Components: AVAL, BAP, BBD, BCS, BCH, BFR, BMA, BMO, BNS, BPOP, BSAC, BSBR, CIB, CM, CS, DB, FBP, GGAL, HDB, HSBC, IBN, ING, ITUB, KB, NTB, RY, TD, UBS, WF, WBK, SAN, LYG

International & Private Peers: China Construction Bank, Agricultural Bank of China, Bank of China, BNP Paribas, Japan Post Bank, SMBC Group, Soc-Gen, Mizuho Financial

Industry Backdrop & Investment Considerations

The group tends to trade very correlated as Macro influences outweigh individual company attributes, but there are still plenty of metrics to find the best investments for when the environment is favorable. The yield curve tends to drive positioning in the Banks. Bank stock fundamentals are tightly correlated to macro confidence and investor risk appetite. Revenue is tightly correlated to GDP growth (lending, capital markets), interest rates, the yield curve, and credit quality.

With those Macro correlations it is important to look at the countries where the Banks are doing business so there are some stronger opportunities in India/Brazil as opposed to the Eurozone which is in a recession. With increasing recession risks and higher rates, asset quality deterioration is a key risk. Inflation continues to be persistently high and wage pressures are rising. Bank taxes and higher regulatory costs are a concern too. On the positive side, NII growing at 7% CAGR over 2021-24 with most growth coming in 2023 and constitutes 55-60% of revenues, operating earnings of the sector are likely to grow 12% YoY in 2022, 9% in 2023. Canada also faces recession risks as well as a potential housing melt-down which is a major risk. A worsening Macro backdrop makes it a group that likely underperforms.

Latin America and Mexico stand to see potential benefits from nearshoring, improved consumption, high remittances, and potential recovery of local investments. In Brazil expect banks to deliver attractive EPS growth and multi-year high ROE over the next 12-18 months driven by double-digit loan growth, continued NIM expansion, and tight cost control.

India is another interesting spot as bank stock re-rating cycles work in two legs with the first leg usually driven by expectations around better asset quality and the second more-sustained leg driven by loan growth acceleration that sets an earnings upgrade cycle. Retail/SME demand has resumed and capacity utilization has improved, leading to normalization of loan growth at Indian banks. The catalyst for loan growth acceleration from here is a new capex up-cycle.

Indicators, Metrics & Stock Selection Framework

Net Interest Margin (NIM), Price/Book, EPS Growth, ROE, ROTCE

The main metrics for evaluation Bank stocks include ROE, ROA, P/B, P/E, NIM trends, Dividend, Cost/Income Ratio, Balance Sheet (Deposits), Credit Quality (Charge-Offs, Nonperforming Assets/Loans, Loan Loss Reserves, Tier 1 Capital). The U.S. banking industry has been a significant wealth creator for long-term investors. A primary driver of this return has been the industry's compounding of book value—which is a function of its return on equity (ROE)—coupled with dividends paid to shareholders. Book value is one of the most important measures of valuation available to bank investors. It offers a view of the worth of a company's net assets—what the company's shareholders would receive today if all of the company's assets were sold and liabilities repaid. In this way, it can serve as an index to potential shareholder wealth. The compounding of book value, by extension, maps the trajectory of a company's or industry's ability to create shareholder wealth over time. The primary source of compounding book value is ROE, which tells us how much profit a company generates as a percentage of equity. A bank with higher ROE will compound book value at a faster pace. Banks have been investing heavily in Technology to increase efficiency and improve operations as well as improve customer relationships.

Valuation & Comps

Stock	*	Market Cap	Share Price		Price	Upside /	Price / Adj EPS			Price / PPOP			Price / Tangible Book			RoTE (%)				RoA (%)				Dividend Yield				CET1 Ratio (FL)			
		€ bn	LC		Target	(Downside)	2022e	2023e	2024e	2022e	2023e	2024e	2022e	2023e	2024e	2021	2022e	2023e	2024e	2021	2022e	2023e	2024e	2021	2022e	2023e	2024e	2021	2022e	2023e	2024e
Austria		4.4					13.8x	7.3x	6.4x	4.9x	4.2x	4.0x	1.4x	1.2x	1.1x	13.6%	9.5%	17.4%	18.3%	0.83%	0.59%	1.14%	1.23%	6.0%	6.2%	7.1%	7.7%	15.0%	13.0%	13.2%	13.40%
Bawag P.S.K	O	4.4	EUR	49.52	69.00	39%	13.8x	7.3x	6.4x	4.9x	4.2x	4.0x	1.4x	1.2x	1.1x	13.6%	9.5%	17.4%	18.3%	0.83%	0.59%	1.14%	1.23%	6.0%	6.2%	7.1%	7.7%	15.0%	13.0%	13.2%	13.4%
France		107.9					5.6x	7.1x	5.6x	3.1x	3.2x	2.8x	0.6x	0.5x	0.5x	9.8%	9.9%	7.6%	9.2%	0.31%	0.31%	0.23%	0.29%	8.4%	8.8%	6.1%	7.7%	12.7%	12.2%	12.2%	12.4%
BNP Paribas	E	59.4	EUR	47.88	67.00	40%	6.2x	7.6x	5.9x	3.5x	3.7x	3.1x	0.6x	0.5x	0.5x	8.9%	9.3%	7.1%	8.6%	0.33%	0.35%	0.26%	0.33%	7.6%	7.7%	5.8%	7.5%	12.9%	12.8%	13.0%	13.1%
Societe Generale	O	20.0	EUR	23.36	34.00	46%	3.7x	5.6x	4.2x	2.0x	2.0x	1.8x	0.4x	0.4x	0.3x	9.7%	10.0%	6.5%	8.3%	0.32%	0.34%	0.21%	0.28%	6.9%	8.6%	5.5%	7.4%	13.7%	12.1%	12.0%	12.1%
Credit Agricole	U	28.5	EUR	9.33	10.60	14%	5.9x	7.1x	5.9x	3.1x	3.1x	2.9x	0.7x	0.7x	0.6x	11.7%	11.1%	9.5%	11.0%	0.25%	0.23%	0.19%	0.23%	11.1%	11.3%	7.1%	8.5%	11.6%	11.0%	10.8%	11.2%
Benelux		68.0					8.3x	8.2x	6.6x	4.9x	4.4x	3.8x	0.8x	0.8x	0.7x	11.1%	9.6%	9.7%	11.2%	0.62%	0.50%	0.48%	0.56%	9.6%	7.9%	7.4%	8.1%	15.8%	14.8%	14.1%	13.7%
ING	O	37.5	EUR	9.89	14.00	41%	8.6x	8.2x	6.4x	4.4x	4.1x	3.5x	0.7x	0.7x	0.6x	9.7%	8.2%	8.4%	10.2%	0.54%	0.44%	0.44%	0.53%	6.2%	8.3%	7.2%	7.9%	15.9%	14.7%	13.6%	13.1%
KBC	E	21.1	EUR	50.28	69.00	37%	8.2x	8.5x	7.5x	5.8x	5.3x	4.8x	1.2x	1.1x	1.1x	14.7%	13.8%	13.7%	14.7%	0.85%	0.71%	0.64%	0.70%	17.0%	7.9%	8.4%	8.6%	15.5%	14.9%	15.0%	14.9%
ABN AMRO	E	9.4	EUR	9.94	13.70	38%	7.6x	7.3x	5.5x	4.7x	3.7x	2.9x	0.4x	0.4x	0.4x	8.5%	6.0%	5.9%	7.1%	0.42%	0.29%	0.29%	0.36%	6.1%	6.4%	5.8%	7.6%	16.3%	14.9%	13.8%	13.6%
Investment Banks		88.4					7.7x	6.8x	5.4x	5.4x	4.6x	3.8x	0.8x	0.7x	0.7x	11.4%	9.6%	11.1%	12.7%	0.54%	0.43%	0.47%	0.54%	2.7%	3.1%	3.6%	3.7%	14.5%	13.6%	13.3%	12.3%
UBS	E	56.9	CHF	15.90	20.00	26%	8.0x	7.3x	6.2x	6.2x	5.5x	4.6x	1.0x	0.9x	0.9x	15.7%	13.1%	14.0%	15.4%	0.75%	0.59%	0.59%	0.63%	3.0%	3.0%	3.0%	2.9%	15.0%	13.9%	13.2%	12.2%
Deutsche Bank	E	20.4	EUR	9.79	14.00	43%	6.7x	6.0x	4.6x	3.1x	2.6x	2.5x	0.4x	0.4x	0.3x	4.5%	5.8%	6.1%	7.5%	0.17%	0.22%	0.24%	0.31%	2.1%	4.0%	4.9%	4.7%	13.2%	12.9%	13.1%	12.2%
Credit Suisse	+	11.1	CHF	4.12	++	nm	nm	5.5x	3.1x	nm	3.5x	2.2x	0.3x	0.3x	0.3x	2.6%	-1.2%	5.0%	8.7%	0.13%	-0.06%	0.26%	0.47%	2.3%	2.4%	4.8%	5.9%	14.4%	13.0%	13.7%	13.5%
Swiss banks		10.6					10.3x	9.6x	9.4x	8.2x	7.8x	7.6x	2.4x	2.3x	2.1x	29.1%	23.8%	24.5%	23.4%	1.01%	0.82%	0.84%	0.82%	5.2%	5.1%	5.0%	5.0%	16.4%	14.5%	14.7%	14.9%
Julius Baer	E	10.6	CHF	48.58	60.00	24%	10.3x	9.6x	9.4x	8.2x	7.8x	7.6x	2.4x	2.3x	2.1x	29.1%	23.8%	24.5%	23.4%	1.01%	0.82%	0.84%	0.82%	5.2%	5.1%	5.0%	5.0%	16.4%	14.5%	14.7%	14.9%
Germany		10.3					6.3x	6.9x	4.6x	3.1x	2.6x	2.3x	0.4x	0.4x	0.3x	5.8%	6.5%	5.6%	7.8%	0.28%	0.34%	0.31%	0.42%	0.0%	3.3%	5.7%	7.6%	13.6%	13.7%	13.2%	12.9%
Commerzbank	O	10.3	EUR	8.16	13.00	59%	6.3x	6.9x	4.6x	3.1x	2.6x	2.3x	0.4x	0.4x	0.3x	5.8%	6.5%	5.6%	7.8%	0.28%	0.34%	0.31%	0.42%	0.0%	3.3%	5.7%	7.6%	13.6%	13.7%	13.2%	12.9%
Italy		63.4					8.6x	7.4x	6.1x	3.1x	2.8x	2.6x	0.6x	0.5x	0.5x	7.8%	7.0%	7.2%	8.2%	0.44%	0.39%	0.41%	0.51%	6.4%	6.5%	6.9%	7.9%	14.4%	13.7%	14.4%	14.5%
Intesa Sanpaolo	O	37.1	EUR	1.94	2.70	39%	10.8x	7.8x	6.8x	3.5x	3.0x	2.9x	0.7x	0.6x	0.6x	7.7%	6.2%	8.4%	9.4%	0.42%	0.31%	0.45%	0.54%	7.8%	6.6%	8.7%	9.7%	14.0%	12.8%	14.2%	14.8%
UniCredit	O	26.2	EUR	12.90	16.00	24%	5.3x	7.0x	5.1x	2.5x	2.5x	2.2x	0.4x	0.4x	0.3x	7.9%	8.2%	5.6%	6.5%	0.47%	0.50%	0.36%	0.46%	4.5%	6.4%	4.4%	5.4%	15.0%	15.0%	14.6%	14.2%
Spain		116.2					6.5x	6.2x	5.7x	2.8x	2.3x	2.2x	0.7x	0.7x	0.6x	10.5%	11.5%	11.0%	11.1%	0.52%	0.58%	0.56%	0.58%	4.7%	5.5%	6.3%	7.0%	12.4%	12.3%	12.3%	12.4%
Santander	E	44.3	EUR	2.62	4.10	56%	5.2x	4.9x	4.6x	1.6x	1.4x	1.3x	0.6x	0.5x	0.5x	11.9%	11.7%	11.3%	11.2%	0.52%	0.52%	0.50%	0.50%	3.9%	3.9%	5.0%	5.2%	12.0%	12.1%	12.0%	12.1%
BBVA	O	32.1	EUR	5.29	7.70	46%	5.7x	6.2x	5.7x	2.4x	2.2x	2.2x	0.7x	0.7x	0.6x	11.2%	13.7%	11.4%	11.3%	0.67%	0.89%	0.80%	0.84%	6.3%	7.3%	7.3%	8.3%	12.7%	12.3%	12.8%	13.2%
Caixabank	O	27.3	EUR	3.37	5.00	48%	9.1x	7.8x	7.0x	4.9x	3.8x	3.4x	0.9x	0.8x	0.8x	9.8%	9.7%	10.8%	11.5%	0.45%	0.42%	0.46%	0.50%	4.5%	5.5%	6.8%	8.0%	12.8%	12.3%	12.1%	11.9%
Sabadell	E	4.6	EUR	0.81	1.00	23%	5.8x	6.7x	5.5x	2.0x	2.0x	1.9x	0.4x	0.4x	0.4x	3.0%	7.4%	6.2%	7.2%	0.12%	0.31%	0.26%	0.31%	3.7%	7.8%	6.7%	7.9%	12.2%	12.5%	12.4%	12.3%
Bankinter	E	5.5	EUR	6.10	7.70	26%	9.9x	8.7x	8.2x	4.7x	4.0x	3.7x	1.2x	1.1x	1.0x	8.6%	12.0%	13.2%	13.1%	0.39%	0.48%	0.51%	0.53%	3.9%	5.2%	5.9%	6.3%	12.1%	12.0%	12.1%	12.2%
Unicaja	U	2.4	EUR	0.89	1.20	35%	7.6x	5.2x	5.1x	3.3x	2.6x	2.5x	0.4x	0.4x	0.3x	2.0%	4.9%	7.0%	6.9%	0.11%	0.27%	0.39%	0.39%	2.9%	7.1%	10.2%	10.4%	12.5%	12.8%	13.0%	13.1%
UK		89.6					5.6x	5.5x	5.4x	3.1x	2.8x	2.8x	0.8x	0.7x	0.6x	12.0%	12.8%	13.1%	11.8%	0.47%	0.47%	0.46%	0.45%	4.7%	7.2%	5.3%	5.7%	16.9%	14.5%	14.0%	13.8%
Lloyds	E	32.9	GBp	41.78	58.00	39%	6.2x	6.3x	5.7x	3.4x	3.1x	3.0x	0.9x	0.7x	0.6x	11.4%	12.9%	12.4%	11.6%	0.50%	0.53%	0.49%	0.51%	5.0%	5.7%	5.9%	6.1%	17.3%	15.1%	14.2%	14.1%
Barclays Bank	E	27.8	GBp	150.10	200.00	33%	4.9x	5.2x	5.3x	2.4x	2.4x	2.4x	0.5x	0.5x	0.4x	13.0%	10.9%	9.7%	8.6%	0.45%	0.36%	0.33%	0.32%	4.2%	4.5%	5.3%	5.9%	15.1%	13.7%	13.6%	13.8%
Natwest Group	O	26.7	GBp	235.80	340.00	44%	5.7x	5.0x	5.1x	3.6x	2.9x	2.9x	0.9x	0.8x	0.7x	11.7%	14.6%	17.6%	15.4%	0.46%	0.52%	0.57%	0.52%	4.8%	11.7%	4.7%	4.9%	18.2%	14.5%	14.0%	13.5%
Virgin Money	U	2.3	GBp	137.90	165.00	20%	3.7x	5.3x	5.1x	2.3x	2.5x	2.3x	0.4x	0.4x	0.4x	17.9%	12.3%	8.0%	7.9%	0.77%	0.59%	0.40%	0.42%	0.7%	5.4%	5.6%	6.5%	14.9%	14.9%	14.9%	14.9%
Ireland		15.9					10.5x	9.4x	8.7x	7.8x	5.8x	5.6x	0.7x	0.7x	0.7x	10.0%	7.2%	7.9%	8.10%	0.76%	0.54%	0.60%	0.64%	1.1%	2.0%	3.7%	4.3%	16.3%	15.5%	14.9%	15.18%
Bank of Ireland	E	8.1	EUR	7.51	7.60	1%	10.4x	7.9x	7.5x	7.3x	5.1x	5.1x	0.8x	0.7x	0.7x	11.5%	7.7%	9.4%	9.4%	0.71%	0.50%	0.66%	0.68%	0.7%	1.6%	3.3%	4.6%	16.0%	15.7%	14.6%	14.5%
Allied Irish Bank	E	7.8	EUR	2.91	3.00	3%	10.5x	11.0x	9.9x	8.3x	6.5x	6.2x	0.7x	0.7x	0.7x	8.4%	6.7%	6.4%	6.8%	0.81%	0.58%	0.54%	0.60%	1.6%	2.4%	4.1%	4.1%	16.6%	15.4%	15.3%	15.8%
UK / Asia		124.5					5.6x	5.2x	4.6x	4.3x	3.5x	3.2x	0.7x	0.6x	0.6x	9.0%	12.0%	12.8%	13.5%	0.47%	0.60%	0.61%	0.66%	4.3%	5.0%	8.1%	9.2%	15.6%	13.6%	14.1%	14.4%
HSBC	O	106.7	HKD	41.40	59.80	44%	5.6x	5.3x	4.7x	4.4x	3.6x	3.4x	0.7x	0.7x	0.6x	9.4%	12.5%	13.4%	14.0%	0.50%	0.63%	0.65%	0.69%	4.7%	5.6%	9.1%	10.1%	15.8%	13.7%	14.2%	14.6%
Standard Chartered	O	17.8	HKD	48.00	69.30	44%	5.5x	5.0x	4.0x	3.3x	2.8x	2.3x	0.5x	0.4x	0.4x	6.5%	8.9%	9.4%	10.6%	0.31%	0.40%	0.39%	0.44%	1.6%	1.9%	2.0%	3.9%	14.1%	13.3%	13.5%	13.7%

Management Commentary

Royal Bank (RY) on Canada's economy…. "So we are expecting and forecasting that there will be a contraction in the economy in Canada, although we do think it will be moderate. And there's a couple of fundamentals that are really looking to help that land on a soft landing as opposed to a deep recession. But as you expect, the interest rate driving is putting more pressure on individuals and their cash flow needs. But what you're seeing, in particular, in Canada is such a high degree of surplus liquidity. And I would say in Canada versus what you may have seen in the U.S., where it's sitting more in the top 20% of the country base, you're seeing in Canada that it really got into hands of both the consumer and the commercial. So you've got consumers and commercial clients sitting on a much healthier balance sheet, which you expect to have a mitigating factor in terms of the overall impact to what we're seeing from the interest rates, which is why we're expecting that contraction to hopefully be muted over time. But realistically, that's a bit of a healthy pull back in terms of where we were seeing not only house prices run up to, but in terms of our mortgage volumes. And I would say that one of the things in Canada in particular is it's really a bit of a supply-demand economy. Because in Canada, we do have a very strong economic growth as it relates to our immigration policies. So that really drives increase in demand. You're seeing a number of individual single first-time homebuyers that are homebuyers in terms of single buyers, about 30%. That's up from 15% 10 years ago. So that's putting further pressure on our demand."

OptionsHawk Executive Summary & Focus Stocks

ICICI Bank (IBN) is my favorite in this group with its impressive growth and with India a strong multi-year economic growth outlook. I want to avoid Canadian banks with concerns on the housing market in Canada and also avoid European banks with the likelihood of a deeper recession. **Credicorp (BAP)** in Peru is another large cap that screens favorably to peers. **Banco Marco (BMA)** in Argentina screens as the most attractive small cap foreign bank.

Banks – National Banks & Trust Banks - US

Components: BAC, C, GS, JPM, MS, PNC, WFC, USB, TFC

International & Private Peers

Intro

Despite expectations for Banks to do well in a rising rate environment this entire group is lower YTD with the names most closely tied to Housing/Macro the weakest and names more closely tied to Markets doing better.

Industry Backdrop & Investment Considerations

US banks were seen to be beneficiaries of higher interest rates but also have faced plenty of headwinds including a weaker Macro backdrop, a slowing housing market, worsening credit, higher operating expenses, and weaker investment banking results. NIM consensus is seen expanding each year through 2024 for most of the banks. The combination of inflation and quantitative tightening is resulting in higher loan balances with lower deposit funding. Industry-wide loan growth is up 10.36% y/y versus 3.4% at year-end 2021. Loan growth has been driven by inventory rebuild and capex, as well as strong consumer spend even as savings decline, and slower debt capital markets activity. However, on a linked-quarter average basis, loan growth has begun to decelerate. The Federal Reserve's Quantitative Tightening program is succeeding in pulling liquidity from the banking system. Deposits have gone from growing 5% right before QT kicked off in June to shrinking year-on-year now. Expect deposits to continue shrinking until the Fed stops QT.

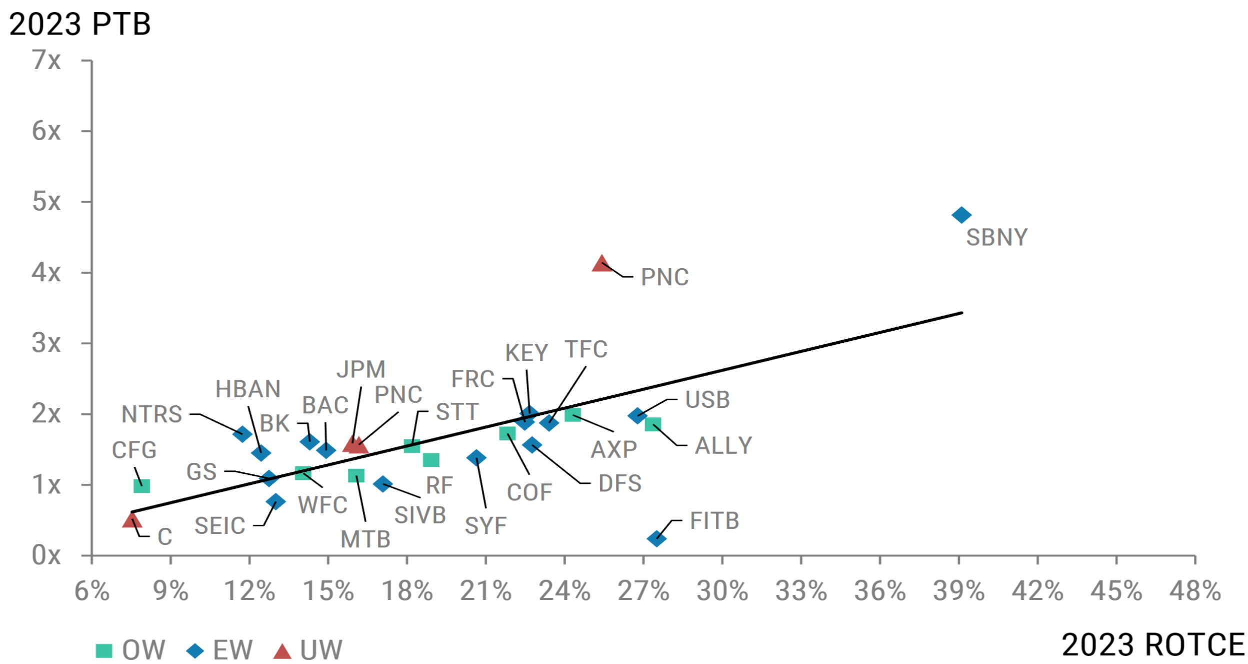
Indicators, Metrics & Stock Selection Framework

Net Interest Margin (NIM), Price/Book, EPS Growth, ROE, ROTCE

The main metrics for evaluation Bank stocks include ROE, ROA, P/B, P/E, NIM trends, Dividend, Cost/Income Ratio, Balance Sheet (Deposits), Credit Quality (Charge-Offs, Nonperforming Assets/Loans, Loan Loss Reserves, Tier 1 Capital). The U.S. banking industry has been a significant wealth creator for long-term investors. A primary driver of this return has been the industry's compounding of book value—which is a function of its return on equity (ROE)—coupled with dividends paid to shareholders. Book value is one of the most important measures of valuation available to bank investors. It offers a view of the worth of a company's net assets—what the company's shareholders would receive today if all of the company's assets were sold and liabilities repaid. In this way, it can serve as an index to potential shareholder wealth. The compounding of book value, by extension, maps the trajectory of a company's or industry's ability to create shareholder wealth over time. The primary source of compounding book value is ROE, which tells us how much profit a company generates as a percentage of equity. A bank with higher ROE will compound book value at a faster pace. Banks have been investing heavily in Technology to increase efficiency and improve operations as well as improve customer relationships.

Valuation & Comps

Ticker	Company	Mkt Cap	Price/Book	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	Revenue CAGR (FY0-FY2)	ROE	NIM
National								
JPM	JPMorgan Chase & Co	387.7B	1.49X	70%	2.93%	5.22%	13.91%	1.64%
BAC	Bank of America Corp	259.8B	1.06X	85%	3.18%	5.59%	9.77%	1.66%
WFC	Wells Fargo & Co	161.9B	0.99X	1055%	7.69%	5.84%	11.24%	2.05%
MS	Morgan Stanley	151.2B	1.64X	36%	8.86%	4.47%	9.85%	
GS	Goldman Sachs Group Inc	121.6B	1.16X	137%	7.02%	4.54%	9.99%	
C	Citigroup Inc	86.9B	0.48X	103%	6.28%	1.13%	5.89%	1.99%
USB	US Bancorp	66.0B	1.49X	65%	5.36%	10.61%	14.65%	2.49%
PNC	PNC Financial Services Group Inc	62.1B	1.47X	-25%	0.26%	5.97%	13.14%	2.29%
TFC	Truist Financial Corp	55.8B	0.98X	44%	0.63%	5.26%	9.93%	



			Scenario Value						Earnings & Profitability										BVPS / TBVPS			
		Price	Scenario Value			Chg to PT (%)			EPS		EPS Y/Y Chg.		EPS Ex. Reserve Release		EPS Ex. Reserve Release Y/Y Chg.		ROE	ROTCE	BVPS		TBVPS	
Ticker	Rating	11/1/22	Base	Bull	Bear	Base	Bull	Bear	2022e	2023e	2022e	2023e	2022e	2023e	2022e	2023e	2023e	2023e	3Q22	2023e	3Q22	2023e
US Money Centers																						
BAC	EW	36.20	36	47	16	**-1%**	30%	-56%	3.18	3.40	-6%	7%	3.21	3.54	19%	10%	11%	15%	29.96	33.36	21.21	24.34
C	UW	46.22	44	61	18	**-5%**	32%	-61%	7.18	6.38	-34%	-11%	7.65	6.62	1%	-13%	7%	8%	92.71	100.69	80.41	88.46
GS	EW	348.58	341	430	162	**-2%**	23%	-54%	33.40	38.34	-44%	15%	37.49	40.73	-37%	9%	12%	13%	310.01	342.72	286.59	319.25
JPM	UW	128.15	126	160	55	**-2%**	25%	-57%	11.84	12.10	-23%	2%	12.54	12.87	2%	3%	13%	16%	87.00	97.63	69.90	80.61
Median						**-2%**	**27%**	**-56%**			**-29%**	**5%**			**2%**	**6%**	**11%**	**14%**				
Super-Regional Banks																						
TFC	EW	44.82	55	75	20	**23%**	67%	-55%	4.98	4.78	-10%	-4%	4.87	5.00	5%	3%	11%	23%	40.79	46.13	18.36	23.88
PNC	UW	161.81	172	209	65	**6%**	29%	-60%	14.39	15.60	-10%	8%	14.04	16.54	23%	18%	12%	16%	115.56	132.56	87.29	103.15
RF	OW	22.30	27	32	9	**21%**	43%	-60%	2.22	2.44	-11%	10%	2.22	2.53	16%	14%	15%	24%	14.47	17.43	8.32	11.21
USB	EW	42.88	57	67	24	**33%**	56%	-44%	4.48	5.13	-12%	14%	4.69	5.44	13%	16%	17%	27%	27.39	32.06	17.48	21.71
WFC	OW	46.95	54	67	19	**15%**	43%	-60%	4.62	5.39	-4%	17%	4.57	5.58	25%	22%	12%	14%	41.72	47.20	35.04	40.30
Median						**21%**	**43%**	**-60%**			**-10%**	**10%**			**16%**	**16%**	**12%**	**23%**				
Trust Banks																						
BK	EW	42.23	41	53	31	**-3%**	26%	-27%	4.32	4.08	2%	-6%	4.34	4.08	9%	-6%	9%	14%	43.18	49.07	21.55	26.20
NTRS	EW	84.72	94	138	64	**11%**	63%	-24%	7.28	5.93	2%	-18%	7.32	5.93	7%	-19%	11%	12%	48.68	52.71	45.42	49.34
STT	OW	74.40	81	106	54	**9%**	42%	-27%	7.25	7.97	-2%	10%	7.27	7.97	-1%	10%	12%	18%	64.33	72.05	44.35	47.98
SEIC	UW	54.52	51	70	32	**-6%**	28%	-41%	3.74	3.27	-2%	-13%	3.74	3.27	-2%	-13%	23%	25%	14.32	14.52	13.01	13.16
Median						**9%**	**42%**	**-27%**			**2%**	**-6%**			**7%**	**-6%**	**11%**	**14%**				

Management Commentary

Bank of America (BAC) on spending…. "First, consumers continue to spend at strong levels. Second, consumer customer average deposit levels for September 2022, remain at multiples of the pre-pandemic levels. You can see that in the lower right. Third, there's plenty of capacity for borrowing as credit and card balances of BAC are still 12% both pre-pandemic levels, and the payment rates on those credit cards are 1,000 basis points over pre-pandemic levels. So on spending a couple thoughts. A perspicacious analyst might wonder whether [talk of] inflation recession and other factors would fructify in a slower spending growth. We just don't see here at Bank of America. Year-to-date spending of $3.1 trillion through September is up 12% compared to last year. Second, as you look across the period, you can see in the trend of year-over-year spending. It's notable that this isn't just inflation that is driving spending as a transaction are up single digits year-over-year pretty consistently. You'll also note on the bottom left, the continued growth in goods and services, particularly retail toward experiences on travel and entertainment. While fuel price volatility continues, it is not currently impacting the spend levels in this quarter as prices stabilize. Average deposit balances of our consumer customer remained at high levels relative to a year ago. These balances are still multiples of the pre-pandemic periods, and they were largely unchanged at these elevated amounts for the month of September."

Morgan Stanley (MS) on Investment Markets…. "Investment Management and Investment Banking were clearly impacted by the market environment. But as I've said elsewhere, advisory and underwriting activity has not gone away. It has simply been deferred. Fixed income and equities remains very solid with no areas of obvious concern. Both businesses navigated the complicated markets without serious incident. A wholesale retreat from the market is not called for, but at the same time, one must be more cautious in credit-sensitive parts of the business. Fortunately, the business model changes for the past decade or more plus the acquisitions of Smith Barney, E*TRADE and Eaton Vance put us in a position of significant relative strength and should support solid absolute performance in the months ahead. And with Wealth Management, we brought in $65 billion of new money in one of the most difficult quarters that we've had in 15 years. I mean, that would have been unthinkable even 2 years ago. So the fact our clients are continuing to bring us money and the funnel of all the ways the money comes in the door is working, it's not -- that's not an accident."

OptionsHawk Executive Summary & Focus Stocks

Wells Fargo (WFC) looks most attractive trading less than Book while having a double-digit ROE and one of the higher EPS growth outlooks, a turnaround story that can re-rate higher. **US Bancorp (USB)** is a growth and NIM/ROE leader though trades at a premium valuation, but a best-in-class operator.

Banks – Regional Banks

Components: FRC, FITB, SIVB, MTB, RF, KEY, CFG, HBAN, CBSH, FHN, CMA, EWBC, PB, ZION, PBCT, TFSL, SBNY, FFIN, TCF, SSB, CFR, BOKF, WAL, NYCB, SNV, GBCI, PNFP, UBSI, CBU, VLY, OZK, UMPQ, WBS, CIT, WTFC, UMBF, HOMB, STL, FNB, BXS, PPBI, CVBF, BKU, BOH, FIBK, ONB, PACW, EBC, IBTX, ASB, FHB, TCBI, SFBS, HWC, ABCB, ISBC, COLB, CATY, SFNC, INDB, UCBI, IBOC, FULT, FBC, WSBC, WAFD, CFFN, RNST, WSFS, AX, TRMK, CADE, FMBI, FRME, FFBC, BANR, NWBI, LOB, TOWN, SASR, SBCF, TBK, PFS, HOPE, VBTX, BUSE, EGBN, BRKL, HBNC

International & Private Peers

Intro

The regional bank index (KRE) is 9% lower YTD despite street expectations for mid-teens NII growth, HSD loan growth and benign credit costs in 2022, as macro concerns continue to weigh.

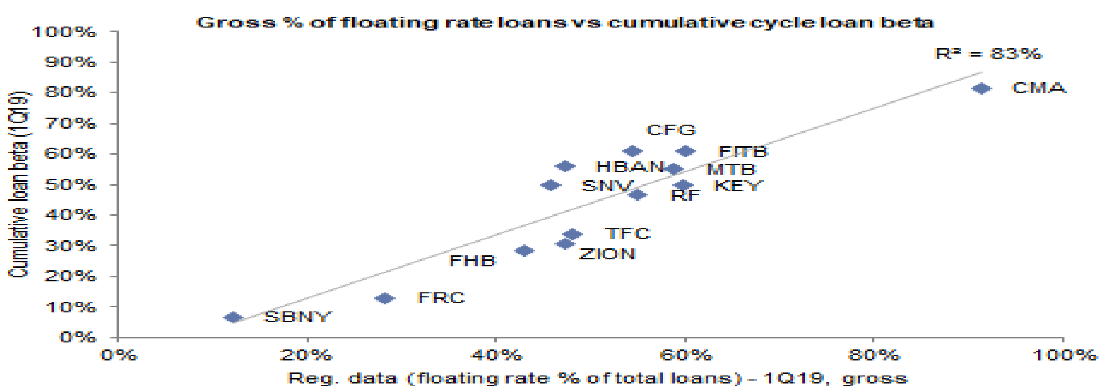
Industry Backdrop & Investment Considerations

The same holds true for the Regional Banks as for the tailwinds and headwinds highlighted in the previous section. Regional Banks continue to screen cheap while investors need to see 1) reserves get closer to recessionary levels and 2) proof that margins will be more resilient than past downturns before they can get very bullish on this group. NII remains a bright spot given rates. Both fees and expenses are sources of PPNR weakness. With the forward curve currently indicating a terminal fed funds rate of >4.25% yields should see significant tailwinds. Floating rate loans (net of swaps) were ~48% of total loans at the start of last cycle, and banks' loan betas underperformed by ~3% given spread pressure and low LT rates. Relative to the last cycle, banks have been more proactive in adding hedges, which both lock in the upside from rates and protect to the downside if rates were to fall. Currently, the forward curve indicates rate cuts in 2024, and this should serve as a buffer when rates eventually move closer to the neutral rate.

Indicators, Metrics & Stock Selection Framework

Net Interest Margin (NIM), Price/Book, EPS Growth, ROE, ROTCE

Historically bank stocks typically underperform in the later portions of the cycle, switching to outperformance following a realization of rate cuts/recession.



Valuation & Comps

Ticker	Company	Mkt Cap	Price/Book	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	Revenue CAGR (FY0-FY2)	ROE	NIM
Regionals								
MTB	M&t Bank Corp	26.1B	1.09X	39%	(5.826%)	8.66%	9.72%	2.76%
FITB	Fifth Third Bancorp	22.6B	1.41X	95%	2.09%	6.23%	14.14%	2.59%
FRC	First Republic Bank	21.4B	1.53X	37%	29.85%	9.94%	9.66%	2.67%
HBAN	Huntington Bancshares Incorporated	21.0B	1.35X	61%	0.45%	5.2%	13.54%	2.94%
RF	Regions Financial Corp	20.6B	1.42X	142%	(0.359%)	4.34%	13.08%	2.85%
CFG	Citizens Financial Group Inc	19.7B	0.88X	132%	(0.384%)	7.37%	10.3%	2.72%
KEY	KeyCorp	16.3B	1.40X	104%	4.67%	5.23%	14.86%	2.50%
SIVB	SVB Financial Group	16.1B	1.00X	49%	25.82%	4.65%	10.92%	2.02%
FHN	First Horizon Corp	13.1B	1.69X	116%	6.64%	8.04%	12.41%	2.48%
EWBC	East West Bancorp Inc	9.3B	1.63X	54%	3.35%	9.92%	20.96%	2.72%
CFR	Cullen/Frost Bankers, Inc.	8.8B	2.95X	35%	(4.107%)	11.59%	21.83%	2.53%
CMA	Comerica Incorporated	8.6B	1.67X	148%	(4.72%)	6.77%	24.41%	2.21%
CBSH	Commerce Bancshares, Inc.	8.4B	3.49X	54%	1.14%	3.95%	19.61%	2.58%
WBS	Webster Financial Corporation	8.2B	1.06X	107%	4.79%	11.25%	12.99%	2.84%
SBNY	Signature Bank	7.5B	1.01X	67%	4.5%	8.8%	17.78%	1.97%
WAL	Western Alliance Bancorporation	7.3B	1.32X	77%	8.58%	14.49%	21.16%	3.41%
ZION	Zions Bancorporation NA	7.1B	1.53X	118%	(3.571%)	6.55%	16.34%	2.72%
BOKF	BOK Financial Corp	7.0B	1.52X	42%	(0.085%)	7.93%	13.54%	2.60%
PB	Prosperity Bancshares, Inc.	6.5B	0.97X	-2%	8.25%	9.73%	8.27%	3.14%
SSB	SouthState Corp	6.0B	1.19X	91%	0.23%	7.42%	11.54%	
GBCI	Glacier Bancorp, Inc.	6.0B	2.13X	7%	6.62%	9.01%	11.2%	3.42%
VLY	Valley National Bancorp	5.9B	0.96X	22%	3.09%	10.74%	11.43%	3.17%
NYCB	New York Community Bancorp, Inc.	5.9B	0.65X	22%	3.46%	25.48%	8.67%	2.47%
SNV	Synovus Financial Corp.	5.8B	1.48X	106%	1.98%	6.71%	17.74%	3.01%
PNFP	Pinnacle Financial Partners Inc	5.7B	1.09X	68%	4.5%	11.25%	10.87%	3.02%
UBSI	United Bankshares, Inc.	5.5B	1.23X	27%	(2.74%)	2.91%	9.19%	3.09%
ONB	Old National Bancorp	5.3B	1.11X	27%	(4.111%)	6.1%	12.01%	2.89%
OZK	Bank Ozk	5.3B	1.09X	98%	0.57%	7.14%	11.22%	4.09%
WTFC	Wintrust Financial Corp	5.2B	1.19X	61%	1.56%	11.16%	11.61%	2.58%
FFIN	First Financial Bankshares Inc	5.1B	4.43X	13%	5.68%	4.85%	19.29%	3.40%
FIBK	First Interstate Bancsystem Inc	5.1B	1.38X	19%	3.01%	9.4%	10.92%	2.86%
HOMB	Home Bancshares Inc	4.9B	1.43X	49%	0.77%	8.69%	12.5%	3.66%
CADE	Cadence Bank	4.7B	1.16X	-17%	2.22%	5.56%	11.25%	2.96%
FNB	FNB Corp	4.6B	0.85X	27%	3.41%	8.48%	10.12%	2.68%
HWC	Hancock Whitney Corp	4.5B	1.36X	-1087%	2.03%	6.45%	16.59%	2.95%

Management Commentary

M&T Bank (MTB) on its key focus metrics…. "Long term for us is 10 to 20 years and medium term is probably 5% to 10%. When we think about the bank and we think about how the banks run, we think of a much longer cycles than the average. And so if we think about some of the performance measures that we look at, one of the most important ones for us is PPNR to risk-weighted assets, which is really a close cousin of ROA. And so we look for what is our PPNR to risk-weighted assets, and we always try to be in the top quartile of performance. And so if you decompose PPNR to risk-weighted assets, it's really about what's your net interest margin. And where does that stand relative to peers? And what fee income are you generating and what's your efficiency ratio. And the way we've always tried to run the bank for the long term is have a net interest margin that's a little bit better than the peers, have an efficiency ratio that's a little bit better than the peers. And obviously, the amended interest margin is a key element of PPNR to risk-weighted assets. And so when we look at the margin and our thoughts about that, it really starts on the liability side of the balance sheet, not the asset sides. And it's the mix of deposits that you have. And we've talked about this for a long time, our goal with our clients is to be their primary bank, whether that's a consumer, a small business or a commercial account, we want that operating account where do you have your direct deposit, where do you run your payroll out of if you're a small business."

Fifth Third (FITB) on driving deposit growth…. "We do feel good about our ability to grow deposits for the remainder of this year and as Bryan said, about our ability to grow deposits on an ongoing basis. If you just step back and look at the engines that drive deposit growth here, the integration of the branch and the digital offering has been very powerful for Fifth Third, right? And over the course of the past few years, the investments which we were making in the Southeast have really accelerated. And that is evident in the rate of growth that we see in those markets. Like I mentioned, 8% household growth as an example there. The only bank that has built more branches in the last 3 years in the Southeast and Fifth Third is JPMorgan Chase, okay? So if you just look at ACH volumes over average balances and compare that across banks in our peer group, fifth Third has by far and away the highest turnover, which is a really good thing because what that means is that the balances that are sitting here are being used to support the cash flow velocity of the business as opposed to being treated like an investment alternative, right?"

OptionsHawk Executive Summary & Focus Stocks

There generally is not a lot of disparity across the names in this group but of the $10B+ market cap names, **First Horizon (FHN)** stands out across metrics though most of the names come with very similar numbers. FRC/SIVB are the high growth names but also have exposure to the riskier Tech sector. In the $6B to $9B market cap tier **Prosperity (PB)** screens well at less than 1X Book with a strong EPS growth outlook. WAL is the high ROE/growth name but like FRC/SIVB, 2023 may not yet be the year to own the premium valued Bank. As I browse the smaller Banks in this group, and there are many, a few names that stand out across all key metrics are **Umpqua (UMPQ), First Financial (FFIN), Axos (AX),** and **Seacoast (SBCF).**

Insurance – P&C

Resources: Insurance Journal, Marsh, CLIPS Survey

Components: EIG, TPRE, RLI, PRA, KMPR, KNSL, L, HMN, CB, CINF, CNA, AFG, THG, SIGI, TRV, UVE, ANAT, MKL, BRK.B, AIG, BRK/B

International & Private Peers: State Farm, Munich RE, Allianz SE, AXA SA, Zurich Insurance, Tokio Marine, Ping An, NKSJ Holding

Intro

P&C stocks are seeing significant tailwinds from rising interest rates for EPS revisions but also face mounting risks. Medical costs and wage inflation have lagged the initial increases to CPI, and these are bigger inputs into P&C loss cost trends for commercial insurers. So far in 2022 the underwriting loss ratios have held up better than expected as overall CPI did not necessarily translate into claims loss cost inflation. That said, medical costs, wage inflation, and legal services are all bigger inputs and these areas of inflation have begun to increase more significantly over the last few months. The big offset is net investment income yields improving. Hurricane Ian will result in an estimated $45B of insured losses.

Industry Backdrop & Investment Considerations

The property and casualty insurance industry is highly competitive in the areas of price, service, product offerings, agent relationships and methods of distribution. Distribution methods include the use of local independent agents, national agent partners, agency aggregators and carrier-based agencies, as well as direct to consumer, affinity and emerging partner platforms.

The property and casualty industry is cyclical. P&C insurance is considered one of the most defensive sectors in US financials with minimal fundamental exposure to equity markets while its correlation to interest rate movements is also below that of the market. P&C companies also have low credit exposure given the low leverage and high-quality portfolios. Core growth in the P&C industry has been strong in recent years at a mid-single digit pace with pricing strength contributing.

The P&C industry has one of the more unique business cycles in the economy. Long periods of price declines lasting 5-10+ years are punctuated by sharp spikes in pricing power lasting 2-4 years. While all P&C lines move differently, the broader industry swings are driven more by inflections in the combined ratio of longer duration commercial lines than personal lines. Periods of concentrated pricing power are referred to as “hard” markets as it is during these dislocated periods that insurance capacity is difficult to obtain for insurance buyers. Periods where pricing is declining are referred to as a “soft” market.

Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, P/Book, ROE, Combined Ratio, Premium Growth, Loss Ratio

The P&C Insurance group differs from many other companies as revenues hold less importance and metrics like Net Premiums Written and Net Premiums Earned, and their respective ratios are observed. The combined ratio is another metric, the sum of the Loss and Expense ratios, and 100% minus that ratio is the Underwriting Margin. Investment income is also closely watched, often called Float, and secondary source of earnings and closely tied to the rate environment. Reserves is another balance sheet item of important, and a Reserves-to-Loss ratio should be in the 2.5 to 1 range.

P&C insurance is a balance sheet based business. Therefore, Price to Book (P/B) multiple is the most commonly used valuation metric for P&C carriers. P/B valuation has a high correlation with ROE. Companies with higher average ROE and lower volatility are favored by investors. Improving ROE is the key driver for turnaround stories. Buybacks have been a key driver of ROE improvement as it reduces the equity base and repurchases below Book Value are accretive.

Valuation & Comps

Ticker	Company	Mkt Cap	Price/Book	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	Revenue CAGR (FY0-FY2)	ROE	Combined Ratio	Premiums Written
P&C									
BRK.B	Berkshire Hathaway Inc	675.2B	1.49X	25%	6.9%	15.44%	6.77%		
CB	Chubb Ltd	90.2B	1.79X	68%	9.37%	7.93%	9.69%	89.10%	13.38%
AIG	American International Group Inc	46.4B	1.05X	101%	7.13%	2.43%	4.83%		
TRV	Travelers Companies Inc	43.5B	2.03X	31%	9.38%	6.97%	9.84%	94.50%	7.81%
MKL	Markel Corp	17.5B	1.46X		3.71%	15.01%	9.34%	90.30%	23.44%
CINF	Cincinnati Financial Corporation	16.6B	1.74X	96%	15.08%	30.55%	4.56%	88.30%	8.66%
L	Loews Corp	13.4B		274%			12.57%	96.20%	
AFG	American Financial Group Inc	11.6B	2.90X	32%	3.3%	10.41%	19.2%	86.40%	12.45%
CNA	Cna Financial Corp	11.2B	1.41X	50%	15.82%	6.85%	9.68%		8.10%
KNSL	Kinsale Capital Group Inc	6.6B	9.84X	83%	14.52%	24.62%	24.21%	77.10%	38.27%
RLI	RLI Corp	5.8B	4.33X	51%	0.54%	4.83%	7.55%	86.80%	15.03%
SIGI	Selective Insurance Group Inc	5.4B	2.32X	52%	14.25%	7.68%	9.64%	92.80%	11.51%
THG	Hanover Insurance Group Inc	5.0B	2.13X	-13%	13.86%	6.89%	5.87%	97.00%	3.68%
KMPR	Kemper Corp	3.5B	1.41X	-150%	43.39%	(4.987%)	(4.615%)		12.47%
HMN	Horace Mann Educators Corporation	1.5B	1.26X	6%	15.03%	4.49%	8.22%	99.20%	-3.83%
EIG	Employers Holdings Inc	1.2B	1.11X	-27%		18.02%	6.54%	93.10%	-6.37%
PRA	ProAssurance Corporation	1.0B	0.95X	-374%		(0.096%)	(1.065%)	105.00%	17.58%
UVE	Universal Insurance Holdings, Inc.	0.3B	1.39X	-166%	30.66%	10.08%	(88.483%)	105.50%	10.13%

Management Commentary

Chubb (CB) on some of its market trends…. “Agriculture premiums were up nearly 22% in the quarter, driven overwhelmingly by crop insurance growth as a result of commodity price increases and market share gains, we produced near record underwriting income off the back of what we project to be a decent growing season. In terms of the commercial P&C rate environment, market conditions remain quite favorable for most lines of business. The vast majority of our portfolio is achieving favorable risk-adjusted returns. So additional rate is required primarily to keep pace with loss cost, which as I have been saying, are hardly benign in both long-tail and short-tail lines. The market is reasonably disciplined. But given loss cost inflation, and what will be slowing growth and exposure in the future given economic conditions, casualty rates in most classes will need to rise at an accelerated rate or else the industry will fail to keep pace."

Travelers (TRV) on price increases…. "We continue to make excellent progress in achieving pricing increases. I'll discuss homeowners and other production first this morning before spending a bit more time on automobile. For domestic homeowners and other, renewal premium change increased to 14.1% and retention decreased slightly to 83%, both consistent with our expectations. We expect renewal premium change to continue at these levels for the remainder of 2022. Looking ahead to 2023, we expect renewal premium change to increase above these already very strong levels as we implement additional and certain value increases. For domestic automobile, renewal premium change increased to 8.1%, while retention was 83%, also consistent with our expectations. During the quarter, we implemented price increases in 26 states at an average of about 8.5%. We expect that domestic automobile renewal premium change will get into double digits in the fourth quarter and be in the mid-teens throughout 2023. These actions will help us manage growth and improve profitability. Personal Insurance has a strong track record of financial performance, demonstrated by our over 40% net written premium growth and 97% combined ratio for the 5-year period from 2017 to 2021. While we and the industry continue to face near-term environmental headwinds, we remain confident in our ability to deliver attractive returns over time while continuing to build the business for the future."

OptionsHawk Executive Summary & Focus Stocks

Chubb (CB) stands out as the highest quality P&C name with a strong growth outlook, high ROE, growth in premiums written and low combined ratio. **American (AFG)** is a quality mid-cap but comes at a premium valuation that makes it less optimal. **Kinsale (KNSL)** is far and away the best-in-class name of the entire group as a small/mid-cap.

Insurance – Life Insurance

Resources: AM Best

Components: UNM, BHF, AFL, AEL, CNO, LFC, LNC, MET, MFC, PRU, PUK, PFG, HIG, EQH, ATH, SLF, GTS, VOYA, GL, GNW

International & Private Peers: China Life, AXA, Japan Post, Assicurazioni Generali, Nippon Life, Aviva

Intro

Life Insurance companies have traded with lower betas recently, driven by the diversification between earnings sensitivity to equities and interest rates, which have been moving with a tight negative correlation of late. Life insurance balance sheets have broadly benefited from industry restructuring through risk transfer, reserve assumption updates, and excess capital accumulation. Valuations are also attractive relative to the level of interest rates. Adverse marks on alternative investments, lower AUM balances given market decline, and growing concerns over a potential credit cycle remain, but higher interest rates and improved mortality are offsets. Higher interest rates are a tailwind for the earnings prospects, although the impact will be cumulative over time given the slow pace at which the life insurers investment portfolio turn over.

Industry Backdrop & Investment Considerations

In life insurance, earnings and capital are benefiting from higher interest rates, but there are myriad risks associated with actuarial reviews, capital impacts from alternative investment fund returns, accounting changes, and the potential for credit deterioration. Implications of the planned accounting overhaul (long duration targeted improvements or LDTI) that is scheduled to go into effect 1Q23 have been top of mind for investors. Excess capital deployment continues to be an important consideration among the life insurers with some companies holding a more substantial amount following an accumulation of excess capital during the pandemic.

There's no escaping that the life insurance sector is macro sensitive. What happens with equity markets, interest rates, credit markets, and foreign exchange rates matters a lot with respect to earnings prospects. Opportunities in fast-growing markets with an emerging middle class in Asia, ageing global population and heightened perception of the important of insurance.

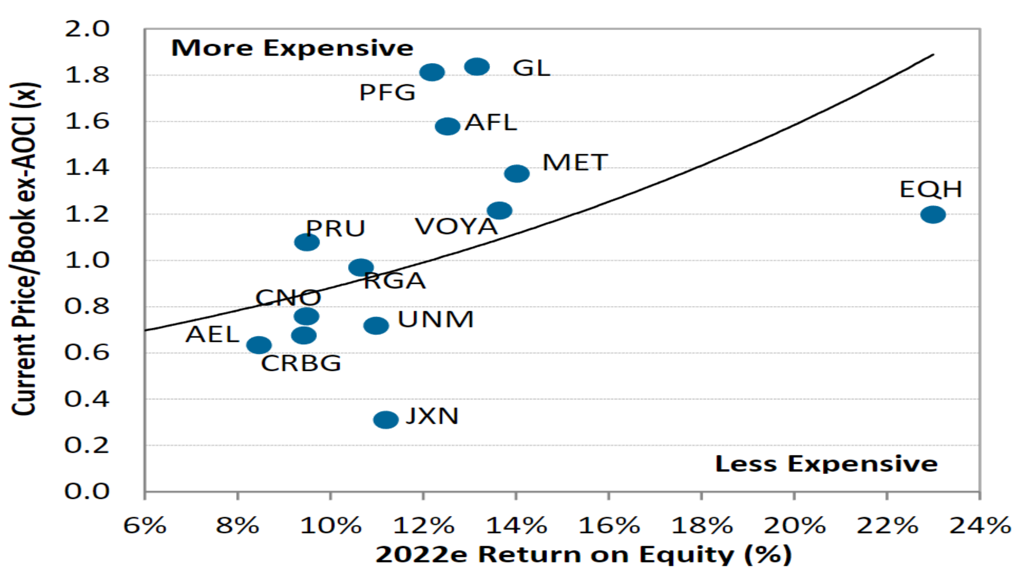
Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, P/Book, ROE, Combined Ratio, Premium Growth, Loss Ratio

Considering the wide range of businesses that fall under life, with varying risk profiles, capital requirements, cash flow generation and growth rates, a sum-of-the-parts valuation is most appropriate. More capital intense, macro sensitive earnings streams (such as long-term care, secondary guarantee universal life and variable annuities with living benefit guarantees) should be assigned a P/E discount to less capital intensive and less macro sensitive earnings (such as variable annuities without living benefits, shorter-tailed accident and health products, and asset management businesses). In terms of cash flow a more relevant measure is sustainable cash generation yield, with cash generation defined as deployable capital generated during the year, and sustainable cash generation defined as deployable recurring capital generated during the year. This is different from free cash flow, which is capital remitted to the holdco, including from non-recurring releases, less holdco costs.

It is important for companies to have attractive avenues to redeploy capital into organic growth.

Valuation & Comps



Ticker	Rating	Price Target	Price ($) 10-Nov	Upside (%)	Mkt Cap ($M)	Div Yield (%)	CF Yield (%)			Operating EPS			P/E Ratio			Book Value ex-AOCI			Price to Book ex-AOCI			ROE (%)		
							2021	2022E	2023E	2021	2022E	2023E	2021	2022E	2023E	2021	2022E	2023E	2021	2022E	2023E	2021	2022E	2023E
AEL	E	43	34.75	23.7	2,942	1.0	4.5	14.8	9.8	3.07	3.90	5.15	11.3	8.9	6.8	40.80	55.64	62.18	0.85	0.62	0.56	8.0	8.5	9.3
AFL	O	69	69.97	(1.4)	41,983	2.4	7.2	7.7	7.7	5.94	5.25	5.40	11.8	13.3	13.0	39.65	44.79	47.09	1.76	1.56	1.49	15.9	12.5	11.8
AMP	E	310	331.56	(6.5)	33,522	1.6	5.6	5.6	5.5	22.69	23.50	28.75	14.6	14.1	11.5	49.89	57.52	67.59	6.65	5.76	4.91	49.9	44.6	46.3
BHF	E	58	53.93	7.5	3,477	0.0	14.4	14.2	11.4	18.86	6.90	14.00	2.9	7.8	3.9	131.90	151.21	146.72	0.41	0.36	0.37	15.4	4.7	9.3
CNO	E	23	22.94	0.3	2,456	2.6	18.9	10.5	10.9	2.78	2.33	2.30	8.2	9.9	10.0	26.86	30.27	32.58	0.85	0.76	0.70	14.2	10.5	9.6
CRBG	E	25	22.85	9.4	14,145	4.2	-	2.1	8.3	4.54	2.75	3.70	5.0	8.3	6.2	30.31	28.00	29.90	0.75	0.82	0.76	12.6	9.4	12.8
EQH	O	44	31.27	40.7	10,827	2.7	17.8	11.9	13.6	6.53	5.32	6.25	4.8	5.9	5.0	20.33	26.66	29.50	1.54	1.17	1.06	27.5	24.0	22.5
GL	U	112	113.85	(1.6)	10,943	0.7	4.9	3.6	3.7	6.86	8.05	10.70	16.6	14.1	10.6	58.50	63.71	72.01	1.95	1.79	1.58	12.3	13.2	15.7
JXN	E	37	36.59	1.1	2,639	7.1	9.9	17.5	13.5	25.39	14.85	18.00	1.4	2.5	2.0	95.52	173.46	196.29	0.38	0.21	0.19	30.4	12.2	11.8
LNC	E	54	34.63	55.9	5,552	5.5	25.7	17.3	12.2	8.19	(3.95)	9.40	4.2	NM	3.7	78.05	66.75	78.00	0.44	0.52	0.44	11.2	(5.4)	13.0
MET	O	85	74.72	13.8	57,096	2.7	9.9	8.3	7.6	9.15	7.20	8.40	8.2	10.4	8.9	57.65	54.48	55.36	1.30	1.37	1.35	14.8	15.2	16.7
PFG	E	76	93.62	(18.8)	21,892	2.9	7.1	11.9	7.0	6.77	6.40	7.05	13.8	14.6	13.3	55.25	51.48	53.85	1.69	1.82	1.74	12.9	12.2	13.6
PRI	E	135	138.25	(2.4)	5,195	1.6	1.5	8.5	5.4	11.61	11.06	13.54	11.9	12.5	10.2	51.28	52.63	60.81	2.70	2.63	2.27	24.3	21.7	24.0
PRU	E	111	107.72	3.0	37,691	4.7	11.2	8.6	9.5	14.57	9.77	11.85	7.4	11.0	9.1	105.69	99.67	93.82	1.02	1.08	1.15	14.7	9.5	12.2
RGA	E	145	139.40	4.0	9,491	2.3	3.1	3.2	5.0	1.11	15.00	15.75	NM	9.3	8.8	139.53	145.20	151.45	1.00	0.96	0.92	0.8	10.7	10.7
UNM	E	45	42.48	5.9	8,783	3.0	3.3	4.8	6.4	4.35	6.30	6.45	9.8	6.7	6.6	54.63	61.14	69.49	0.78	0.69	0.61	8.3	11.0	10.0
VOYA	O	78	68.46	13.9	6,453	1.2	18.1	15.7	11.9	8.35	7.20	7.85	8.2	9.5	8.7	57.08	57.42	62.06	1.20	1.19	1.10	18.4	13.6	14.5

Management Commentary

MetLife (MET) on interest rates…. “For roughly the past decade, we effectively managed through an interest rate environment where our new money rate was below our roll-off rate. In the second quarter, that finally reversed as our new money rate exceeded our roll-off rate. This repeated in the third quarter to even greater effect. With the duration of our investment portfolio at roughly 8 years, we expect the impact of this change to build over time. Broadly speaking, rising interest rates are a good thing for MetLife. And I think John gave some details and color on it, but our new money yield rose again this past quarter. $471 million was the actual number, and that shows continued improvement. I think a reflection of what we're seeing in the market, obviously, with interest rates rising. And so we're very pleased with what it means for our general account investing. We're obviously going to continue to see the portfolio yield rise as a result of that given that our roll-off has been now for the last couple of quarters also lower than our new money rates. The trend is positive. We continue to see and expect our new money yield to increase and continue to expect to see widening spread over the existing portfolio, and that's obviously positive for net investment income.”

Aflac (AFL) on Japan’s seventh COVID wave… “As we signaled last quarter, we experienced elevated COVID incurred claims, driven by its designation as an infectious disease and the industry practice of deemed hospitalization, which allows for payment of claims for care outside of the hospital. To give you an idea of the magnitude, before the seventh wave, our weekly COVID claims were in the 7,000 to 13,000 range. During the recent wave, we peaked at approximately 47,000 weekly COVID claims. Hospitalization remains low, and this lack of severity has resulted in the government of Japan changing the definition of deemed hospitalization. Effective September 26, the scope has been narrowed to the elderly, those requiring hospitalization and individuals more vulnerable to severe symptoms. This change in policy, together with lower overall rates of infection will greatly reduce the volume of new claim submissions. While more volatile than usual, we have established reserves for claims incurred in the period, but not yet reported. Therefore, we expect pressure on Japan's benefit ratio to subside in the fourth quarter.”

SunLife (SLF) on redemptions…. "Yes, I mean, if you look at industry, what's happening in the industry is sales are down pretty dramatically across all product types. We see that across equity, we see that across fixed income product types. And so when you look at our share of outflows. So again, sales -- net as a function of sales and then what clients are doing on the redemption side, we control sales. But on the net side, when you look at our net flows in the industry relative to our assets, our share of active assets, we're generating less outflows than the industry is relative. And that's -- so the way that we're looking at it is sales are tough right now, clearly, with the volatility of the markets. We think that they're going to stay tough for some period of time until the Fed gets to sort of the end of the cycle and volatility comes down and people can look through the other side of the economic slowdown. And so we think we're holding our own relative to the industry, but the dynamics are pretty challenging right now in the retail industry."

Principal (PFG) on its strategic focus…. " Our strategic focus on the business market in Life Insurance is working. Compared to a year ago, sales of nonqualified deferred compensation and business owner solutions more than doubled for the quarter and increased 74% year-to-date. In total, third quarter Life Insurance sales increased 15% compared to the prior year quarter as our decision to focus solely on the business market has more than made up for the reduction in the retail market. As we prepare for continued macroeconomic uncertainty, it's important to remember that our SMB customers are more weighted to the scientific and technical sectors, which tend to be more resilient during economic downturns, and we're less exposed to the hospitality and retail sectors, which tend to be more negatively impacted."

OptionsHawk Executive Summary & Focus Stocks

MetLife (MET), the largest name in this group is also the best looking own although there is not a ton of disparity across the names. MET has seen plenty of bullish longer-term options positioning and still trades at a discount to peers. **Equitable (EQH)** falls into the value buy category of this group. **Voya Financial (VOYA)** is the preferred smaller cap name in this group after recently showing resilient earnings and doing an interesting deal for Benefit Focus. The investment thesis for Voya has shifted away from being a restructuring/expense reduction story, to being one more focused on the acceleration of growth.

Insurance – Reinsurance & Specialty

Components: RNR, RE, RGA, AXS, Y, WRB, ACGL, ESGR, BAMR, SPNT, CRVL, AIZ, TRUP, PLMR, ECPG, AGO, WTM, RYAN, JRVR, TIPT

International & Private Peers: Swiss RE, SCOR SE, Hannover Ruck SE, Munich Reinsurance, China Reinsurance, Lloyd's, PartnerRe, Korean Reinsurance, Great West Lifeco

Intro

Among "the reinsurers", Everest Re's business is 25% primary insurance and 75% reinsurance. Arch's P&C businesses are 50/50 reinsurance/insurance. Arch Capital also has a sizable mortgage insurance business (where it writes both primary and reinsurance coverages) and a significant investment in a trade credit business. AXIS has traditionally been a 50/50 insurance and reinsurance operation, though its reinsurance business is about to get much smaller as a proportion of the overall business. RenaissanceRe is a pure-play reinsurer.

Reinsurers have seen a recent rally on less-than-feared Hurricane Ian losses and an increased sense of urgency th at property reinsurance prices will rise in 2023. While low interest rates had been a headwind for all in surers, it was a particular obstacle for the property reinsurers, which increasingly found themselves competing against fixed income markets pivoting into catastrophe risk and insurance-linked securities markets in order to supplement lost investment yield.

Industry Backdrop & Investment Considerations

The P&C wholesale brokerage industry has been characterized by consolidation over the past decade, with the top 10 wholesale brokers' premium volume growing at a 17% CAGR from 2010 to 2020 versus a 7% CAGR for the US E&S market. Today there are three large P&C wholesalers who place $10B+ of premium, with a significant falloff in scale thereafter. According to the Wholesale & Specialty Insurance Association directory, there are roughly 730 wholesale brokers in the market today.

Insurable risk growth drivers: population density growth near coasts, rising wealth, higher emerging market penetration, rising adverse weather patterns. Liability insurance costs have increased by an average rate of 9% per annum. Well-run reinsurers hold a number of advantages over primary insurers: thinner expense structures, increased capital diversification benefits, tax arbitrage, lower regulatory oversight, etc.

Demand for specialty risk coverage is being driven by accelerating technological innovation, climate change, the modernization of the engineering, manufacturing, and construction sectors, the proliferation of cyber threats, and - more recently - a robust economy.

The E&S market has a dynamic and innovative history of tackling new and emerging risks that are a byproduct of technological innovation. New technologies create risks that standard lines insurers are not comfortable taking, leaving E&S specialists to develop new product coverages. One illustrative example of this is the ride-sharing economy.

Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, P/Book, ROE, Combined Ratio, Premium Growth, Loss Ratio

Reinsurance stocks are typically valued using a Price/Book vs. ROE relationship as the key inputs. Valuations remain around historical averages as ROE pressures remain including large catastrophe losses and low yields, offset by rising investment income and increased consolidation in the sector. Reinsurers trade at a discount to primary P&Cs due to greater volatility in results. The best-of-breed reinsurers have delivered better book value per share compounding than their primary insurance counterparts over the long term.

Valuation & Comps

Ticker	Company	Mkt Cap	Price/Book	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	Revenue CAGR (FY0-FY2)	ROE	Combined Ratio	Premiums Written
Reinsurance & Specialty									
ACGL	Arch Capital Group Ltd.	22.2B	1.82X	119%	13.46%	10.13%	3.5%	85.20%	21.25%
WRB	W R Berkley Corp	19.5B	2.98X	117%	15.76%	8.64%	17.53%	89.60%	20.94%
RE	Everest Re Group Ltd	13.0B	1.64X	285%	18.38%	10.03%	(9.938%)	97.80%	18.06%
RYAN	Ryan Specialty Holdings Inc	10.6B	8.94X	50%	23.39%	16.02%	62.5%		
RGA	Reinsurance Group of America Inc	9.4B	1.07X	-84%	7.37%	3.73%	29.67%		5.85%
RNR	RenaissanceRe Holdings Ltd.	8.1B	1.87X	457%	9.67%	9.4%	(29.88%)	102.10%	34.92%
AIZ	Assurant, Inc.	6.9B	1.56X	-16%	15.14%	4.66%	5.11%		
AXS	AXIS Capital Holdings Ltd	4.9B	1.28X	-351%	19.56%	5.06%	0.22%	97.50%	12.58%
ESGR	Enstar Group Ltd	3.8B		-76%			(42.883%)		-80.80%
AGO	Assured Guaranty Ltd.	3.8B	0.74X	84%	3.49%	(9.307%)	10.4%		-14.72%
WTM	White Mountains Insurance Group Ltc	3.4B		-108%			4.06%		
CRVL	CorVel Corporation	2.5B							
TRUP	Trupanion Inc	2.1B	7.16X	508%	(19.578%)	20.87%	(16.65%)		
BAMR	Brookfield Asset Managmnt Rnsce Pni	2.0B		-2836%			59.92%		1571.89%
PLMR	Palomar Holdings Inc	1.3B	3.41X	503%	19.32%	31.28%	7.89%	80.00%	51.03%
ECPG	Encore Capital Group Inc	1.2B		43%		#########	10.39%		
SPNT	Siriuspoint Ltd	1.0B		-90%			(18.274%)	110.00%	
JRVR	James River Group Holdings Ltd	0.8B	1.59X	-968%	11.35%	11.55%	8.79%	136.90%	19.91%
TIPT	Tiptree Inc	0.5B		-303%			20.87%	90.60%	

Management Commentary

Arch Capital (ACGL) on the current environment…. "The current environment presents Arch with the opportunity to enhance its relationships with clients as they seek out insurance and reinsurance solutions in these uncertain times. The cat activity in the third quarter has significantly increased pressure on property cat markets, which could have ripple effects across all property and casualty lines as we approach the 2023 renewals. Over the last several years, we've maintained that property cat rates have been inadequate. Now the market recognizes this as well. The events of the past 18 months significant interest rate hikes, repricing of investments, ongoing general inflation concerns and the increasing cost of capital, all point to the need for a higher margin safety in the premium with property being the deposed child. From Arch standpoint, as other insurers are reducing their overall participation, we have an opportunity to showcase our outstanding team, strong balance sheet, underwriting acumen and creative things. Competition in P&C is robust, but rational, and the markets are taking a more technical approach to pricing and a project suits Arch's underwriting philosophy. Cyber insurance has become increasingly important to our insurers globally, and we have substantially increased our support because quite simply, we believe that today's cyber market has changed for the better."

W.R. Berkley (WRB) on the different aspects of the marketplace…. " So the marketplace overall remains a very interesting one from our perspective. There are pockets of the market that remain extremely attractive, and there are others that is surprising the level of competition. One of the observations that we have shared in the past and we continue to see very much a reality is how the market is still as cyclical as ever. That having been said, different product lines are marching not in lockstep but very much to the beat of their own drum, which translates to, they are at different points in the cycle at any moment in time. I would tell you that the specialty space, in particular, the E&S space, remains very attractive. In addition to that, I would tell you that if it is a piece of business that falls within the appetite of the standard market, particularly a national carrier and some regional carriers, it is shocking to us how competitive some participants are willing to be. On the other hand, you have professional liability with particularly public D&O standing out as a product line that has become increasingly competitive, and workers' compensation, that is a product line that we've been talking to those that are willing to listen for an extended period of time that we've been surprised by the level of competition."

Ryan (RYAN) on specialties markets…. "As Pat highlighted, it was another solid quarter across our specialties, and the E&S market continues to serve a critical role in an increasingly challenging insurance landscape. This is backed up by A.M. BEST's recent report, which highlighted the sustained expansion and rise in demand for E&S solutions driven by constantly evolving risks and rapidly innovating technology. Diving into our specialties, our wholesale brokerage specialty achieved another quarter of strong growth across property and casualty lines of business. Once again, CAT property was the strongest driver of new business into the non-admitted market. We believe these types of loss events along with themes we've previously discussed are leading to shrinking capacity as well as even higher rates. Ultimately, we believe these factors will lead to more flow into the E&S market as reinsurers further derisk their portfolios during upcoming renewal cycles. We also expect increased flow from other non-CAT markets. There will be a significant need for E&S solutions in 2023, and our depth and breadth of experience and products will remain in high demand."

OptionsHawk Executive Summary & Focus Stocks

Ryan Specialty (RYAN) remains a favorite long-term business though it does trade at a substantial premium to peers with it growing rapidly. **WR Berkley (WRB)** is the favorite large cap of this group though trades rich to RE/RNR/RGA, it is seeing core margin improvement and manages costs way better than peers. None of the smaller names look particularly attractive outside of **Palomar (PLMR)** which has been hit hard recently but remains a compelling specialty growth story and down to 3.4X Book.

<u>Insurance – Brokers</u>

Components: EHTH, GOCO, SLQT, LMND, EVER, ERIE, BRO, ARGO, MMC, WLTW, AJG, PRI, AFSI, MAX, ROOT, WDH, BRP, FANH, WTW, OSCR

International & Private Peers: HUB International, Lockton, Acrisure, USI Insurance Services, Alliant Insurance Services

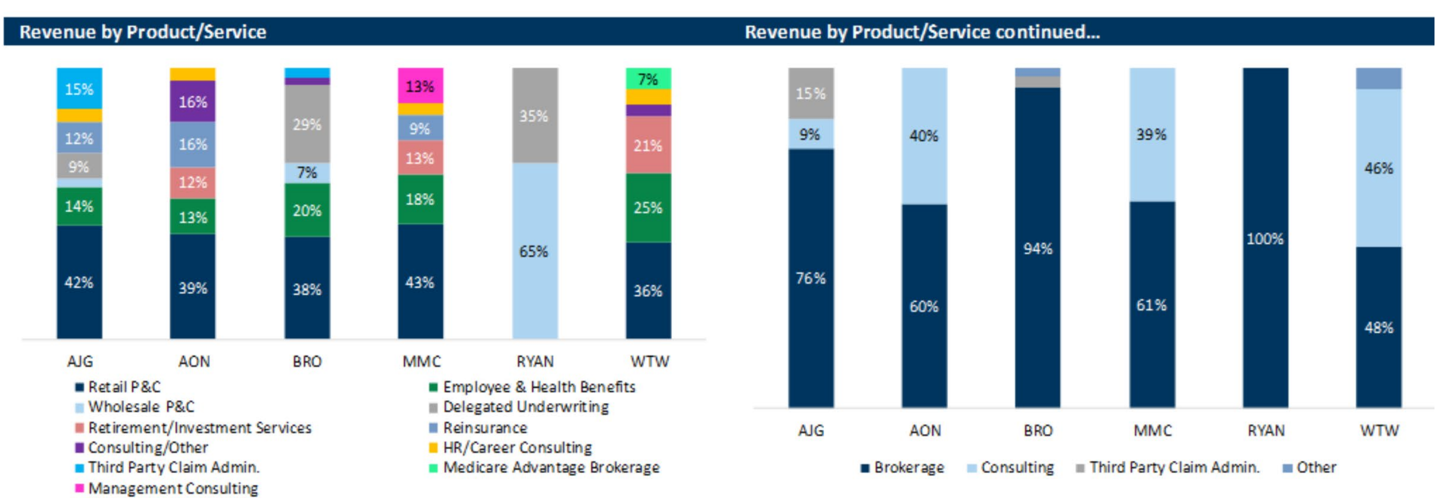
Intro

The current environment lends itself well to brokerage and P&C oriented businesses that can earn higher commissions as premiums distributed reflect the inflationary environment and insurers efforts to protect their bottom line. In contrast, consulting and other primarily fee-based operations need to negotiate higher fees directly with the client for providing the same level of service. US oriented firms stand to benefit from ~5% nominal GDP on average in 2023/2024 and are less impacted from the FX headwinds we expect to pressure revenues for the remainder of 2022. On the product/service side, brokerage and P&C related exposures have a greater ability to capture inflation, have more structural tailwinds, and a greater percentage of non-discretionary revenue. Industry experts see climate change, increasing cyber threats, and increasing business complexity benefiting P&C exposures both near-term and long-term.

Industry Backdrop & Investment Considerations

P&C broker stocks have historically outperformed the 2 years before and after the start of a P&C hard market. P&C brokers benefit from faster revenue growth and operating margin leverage in a hard P&C market. P&C broker stock P/E valuation multiples have historically expanded before a hard market in anticipation of faster earnings growth. Despite Insurance brokers having improved EBITDA margins by nearly 800bps on average over the past decade, there are further efficiency gains to be had over the coming years for these highly scalable businesses with margin expansion driven by strong organic growth, expense management, technology efficiencies, and fiduciary investment income.

P&C Broker industry is an oligopoly with the Top 10 controlling 77% global market share. The Top 2 (MMC and AON) control 38% market share. P&C pricing is a key driver to a P&C broker's revenue growth and operating margin improvement.



Cyber Insurance is an emerging growth opportunity of note. The most favorable product exposures are reinsurance and excess & surplus lines (E&S) as inflation uncertainty, geopolitical risk, and climate change impacting these lines of business in an outsized way over the coming years.

Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, P/Book, ROE, Combined Ratio, Premium Growth, Loss Ratio

Valuation & Comps

Ticker	Company	Mkt Cap	Price/Book	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	Revenue CAGR (FY0-FY2)	ROE
Insurance Brokers							
MMC	Marsh & McLennan Companies Inc	84.8B	8.38X	25%	8.7%	5.76%	23.46%
AJG	Arthur J. Gallagher & Co.	40.4B	4.34X	23%	16.34%	11.26%	17.07%
WTW	Willis Towers Watson PLC	26.5B	2.72X	-2%	11.72%	4.5%	9.64%
BRO	Brown & Brown, Inc.	16.3B	3.61X	32%	9.84%	9.71%	12.97%
ERIE	Erie Indemnity Co	12.3B		2%		5.07%	25.02%
PRI	Primerica, Inc.	5.2B	2.73X	18%	7.9%	6.06%	26.84%
BRP	BRP Group Inc	3.0B	3.32X	149%	39.47%	19.25%	12.68%
LMND	Lemonade Inc	1.2B	1.42X	94%	(2.443%)	44.47%	(41.642%)
ARGO	Argo Group International Holdings, Lt	0.9B	0.80X	-286%	(1.991%)	(3.912%)	4.45%
WDH	Waterdrop Inc - ADR	0.9B	14.74X	1151%	14.1%	13.31%	16.51%
MAX	MediaAlpha Inc	0.6B		-18%	(45.913%)	23.69%	(2501.9%)
OSCR	Oscar Health Inc	0.6B	0.68X		(68.38%)	10.15%	(66.314%)
FANH	Fanhua Inc (ADR)	0.4B	12.24X	-8%	(33.289%)	14.17%	
EVER	EverQuote Inc	0.4B		73%	(89.054%)	15.77%	(24.173%)
GOCO	GoHealth Inc	0.3B	0.39X	-1149%		4.97%	(32.958%)
EHTH	eHealth Inc	0.1B	0.16X	-157%	(16.748%)	11.23%	(14.093%)

Management Commentary

Marsh McLennan (MMC) on its resiliency…. "We are delivering solutions to help clients navigate volatile economic, geopolitical and risk landscape. As we discussed last quarter, there are aspects of the current environment that remains supportive of our growth. Higher inflation offsets lower real GDP growth, rising interest rates boost our fiduciary income, and the challenging insurance market drives a flight to quality. We also have a track record of success and being resilient through cycles, and I believe Marsh McLennan is well positioned to perform."

Willis Tower (WTW) on its growth investments…."For our Grow initiatives, we remain focused on investment in both core and fast-growing markets and innovation to drive differentiation and better client outcomes. In Corporate Risk and Broking, our investments in specialized solutions and strategic hires for our global lines of business are meaningfully accelerating growth with most lines growing double digits this quarter. In Health, Wealth and Career we've seen strong uptake of our solutions that are cross sold across the segment and are increasingly bundling products into our core advisory work. Analytics is a key area for new product development as well, including the recent launch of Risk Intelligence Quantified or Risk IQ."

OptionsHawk Executive Summary & Focus Stocks

Among the large cap broker stocks **Arthur Gallagher (AJG)** once again screens as the best combination of growth, value and operational efficiency. For the smaller names **BRP Group (BRP)** has extremely strong metrics as an interesting name in this group. **Waterdrop (WDH)** has very strong metrics as a more speculative play in the Chinese market.

Insurance – Personal, Auto, Mortgage & Title

Resources: NAIC

Components: ESNT, EFC, AMBC, FNF, RDN, FAF, MTG, MBI, NMIH, STC, PGR, NGHC, MCY, ALL, ORI, GSHD, ACT

International & Private Peers

Intro

In Personal Lines the pressure from inflation has been more apparent as higher vehicle replacement and repair costs have impacted earnings quickly. To make matters more difficult, auto claims severity is trending up quickly. On average, personal lines rates are up roughly +5% for 3Q22 across both home and auto, with home rate filings modestly higher than auto at +6.5% for the industry. Recent pricing action suggests rates continue to rise in response to replacement cost inflation which remains elevated.

Industry Backdrop & Investment Considerations

The Auto Insurance industry in the US is estimated to be $311B while globally is closer to $750B seen growing at an 8.5% CAGR. The Homeowners' Insurance market is estimated at $108B and growing at a 5% CAGR. The Title Insurance market is estimated at $22B and seen growing at a 6.5% CAGR.

Personal insurers face a more difficult environment as financial inflation impacting the cost of replacing automobiles and homes has significantly increased. The auto insurers are further challenged by the increasing frequency of collisions as the economy continues to reopen and difficulties in estimating what return to work normalization looks like. Auto claims frequency trended favorably pre-pandemic but saw a more pronounced decline as driving levels fell substantially as a result of shelter-in-place orders. Losses in home continue to be elevated with a higher frequency and severity of weather-related losses. Profitability should start to bottom out over the next few quarters and set up for a recovery trade.

Usage based insurance is becoming more popular in Auto via the use of telematics technology.

Increasing urbanization and rising disposable income among the middle-income population are expected to provide stable growth for the automobile industry over the next few years.

Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, P/Book, ROE, Combined Ratio, Premium Growth, Loss Ratio

Valuation & Comps

Ticker	Company	Mkt Cap	Price/Book	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	Revenue CAGR (FY0-FY2)	ROE	Combined Ratio	Premiums Written
Personal, Auto & Home									
PGR	Progressive Corp	75.7B	5.21X	-53%	16.52%	10.97%	8.78%	95.30%	14.39%
ALL	Allstate Corp	34.1B	2.15X	-13%	51.03%	5.87%	(8.892%)	95.90%	17.04%
FNF	Fidelity National Financial Inc	10.2B	1.46X	49%	8.15%	(4.18%)	19.01%		
ORI	Old Republic International Corporatio	7.3B	1.31X	40%		(3.106%)	13.66%	89.90%	
FAF	First American Financial Corp	5.4B	1.10X	48%	3.05%	(3.089%)	14.51%		
ESNT	Essent Group Ltd	4.1B	0.89X	65%	5.28%	5.47%	16.63%		-0.48%
ACT	Enact Holdings Inc	4.0B	0.98X		7.97%	5.42%	18.63%	38.00%	4.47%
MTG	MGIC Investment Corp	3.9B	0.83X	42%	(1.596%)	2.59%	23.2%	27.00%	1.49%
RDN	Radian Group Inc	2.9B	0.75X	76%	4.03%	(0.754%)	22.51%		-11.34%
MCY	Mercury General Corp	2.0B	1.31X	-82%		14.06%	3.9%		6.75%
NMIH	NMI Holdings Inc	1.6B	1.01X	36%	8.45%	11.88%	20.15%	34.80%	22.38%
GSHD	Goosehead Insurance Inc	1.5B	-63.00X	1%	57.98%	31.16%	3383.85%		
STC	Stewart Information Services Corp	1.2B	0.84X	92%	16.11%	(7.757%)	11.14%		
EFC	Ellington Financial Inc	0.8B	0.77X	25%	2.82%	8.85%	8.96%		
AMBC	Ambac Financial Group, Inc.	0.7B	0.67X	-111%	(31.98%)	(23.18%)	150.94%		-3.03%
MBI	MBIA Inc	0.7B	5.53X	51%	(6.411%)	(19.97%)	8.59%		25.00%

Management Commentary

Progressive (PGR) on take rates, auto trends and growth…. "We continue to closely monitor frequency and severity trends to ensure we stay true to our stated goal of profit before growth. So we have continued to take rate. We believe we took rate earlier than the industry, which initially negatively impacted volume, but more recently has created opportunities for growth. Consumer shopping and quoting has increased more than 20% in both the agency and direct channels. In fact, in both channels, we had the best July, August and September in our company's history for quote volume. This prospect growth is despite a lower acquisition expense ratio as compared to 2021, allowing us to be a beneficiary as competitors have pulled back on marketing spend. Auto quote growth, coupled with continued improvement in conversion as our competitors raised rates led to auto new application growth of 20% in the quarter including the highest August and highest September combined to channel new application volume that we've seen in the company's history."

Fidelity National (FNF) on housing impact…. "Overall, we have had another strong quarter despite housing market headwinds from ongoing concerns about inflation, surging interest rates and a growing risk of recession. Our title business has continued to perform well despite declining mortgage originations, while F&G continued to deliver on its diversified growth strategy with assets under management climbing to $42 billion at September 30. As expected, this dynamic environment and resulting market decline are impacting our order volumes as the rapid rise in mortgage rates and resulting decline in housing affordability are adding pressure to the normal second half seasonal falloff and purchase transactions. We believe that current refinance volumes are at or near trough levels and would not expect volumes to return in 2023 without a meaningful reduction in mortgage rates. Finally, the countercyclical nature of F&G's business, which benefits from rising interest rate environments, provides an important source of additional earnings as market dynamics put pressure on mortgage origination volumes."

OptionsHawk Executive Summary & Focus Stocks

Progressive (PGR) commands a premium valuation but screens as one of the best names annually and that has not changed with recent strong results. **Enact (ACT)** screens cheap across the smaller names while delivering strong growth and other key metrics. **Goosehead (GSHD)** is the high growth name that has come under pressure but one worth watching when technical momentum is in its favor.

<u>Asset Management – Traditional</u>

Resources: Boston Consulting Group

Components: BLK, TROW, AMP, BEN, SEIC, AMG, APAM, AB, CNS, JHG, FHI, ATCO, FOCS, WDR, NOAH, BSIG, WETF, JXN, SII, AMK

International & Private Peers: Vanguard, Allianz Group, PIMCO, Amundi, Legal & General, BNP Paribas, AXA Group, Sumitomo, Aegon, Schroders, Generali Group, APG Group, DWS, Ashmore, Abrdn , Azimut, Anima

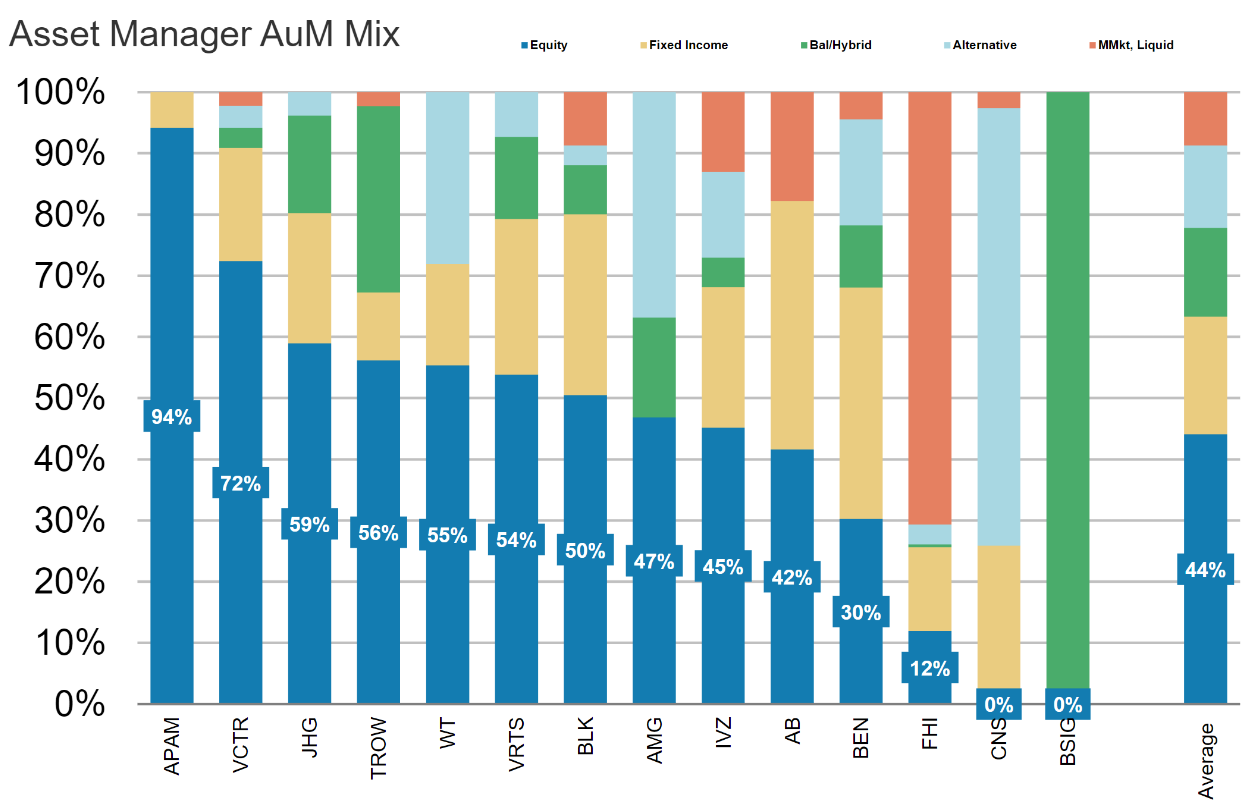
Intro

In the Asset Manager group, benefits have been seen from pro-growth policies and tax reforms as well as deregulation, though the ability to see new funds remains in question with the recent shift to passive investing. We break this group down into Traditional, Capital Markets and Alternative Capital.

In general, there is a less certain growth outlook amid sticky inflation, rising interest rates, growing recession risk and elevated geopolitical risk. Balancing investments for growth and cost flexibility in the face of topline pressures will be key. Growth zones — EM/China, Privates, Solutions — remain compelling on a multiyear view, though likely moderate near term. Cyclical, and growing secular, pressures reinforce the need for M&A/organic investments to improve ability to access growth.

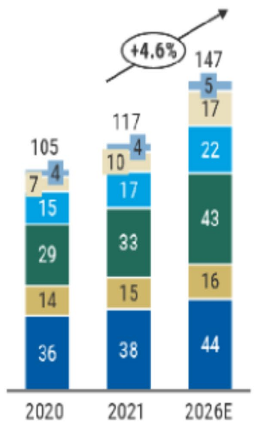
Industry Backdrop & Investment Considerations

Due to the steady nature of the business (taking a percentage of assets under management per year), asset managers have a business valued more like a basic corporate than financial institutions such as banks and insurers. Growing household wealth continues to be a top driver on growth for the asset management industry while the move to more passive investing, target funds, new ETF options and ESG are all powerful themes as well.



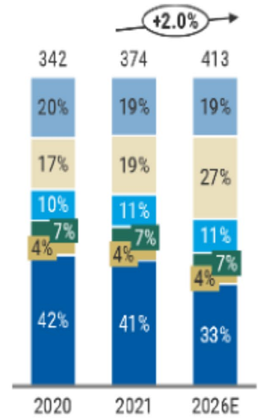
The asset and wealth management industry is facing numerous headwinds, chief among them being ongoing pressure for lower fees. Traditional asset and wealth managers feel this pressure acutely, which has likely contributed to their relative underperformance. Structural headwinds remain for the asset managers, including the shift to passive, active underperformance, pressure/transparency on fees, and more regulations, which come with higher costs and complexity. In addition, market volatility later in a cycle generally does not bode well for interest in the sector and valuations. ESG has been a major theme and growth driver for flows.

Global AuM Composition, 2020-2026E ($TN)



Product	CAGR 21-26E
Hedge Funds	4%
Private Markets	12%
Solutions	6%
Passive	6%
Money Markets	2%
Core Active	3%

Global Revenue Composition, 2020-2026E ($BN)



Product	CAGR 21-26E
Hedge Funds	2%
Private Markets	9%
Solutions	3%
Passive	2%
Money Markets	2%
Core Active	-2%

Key areas for differentiation to drive market share gain remain: (1) innovating with ESG/thematics to further client engagement; (2) enhancing distribution; (3) embracing strategic M&A to access new customers, improve scale, and expand product offerings; (4) addressing the cost base to compete on price and free up resources for growth; and (5) evolving the investment process to embrace quant/alt/systematic processes.

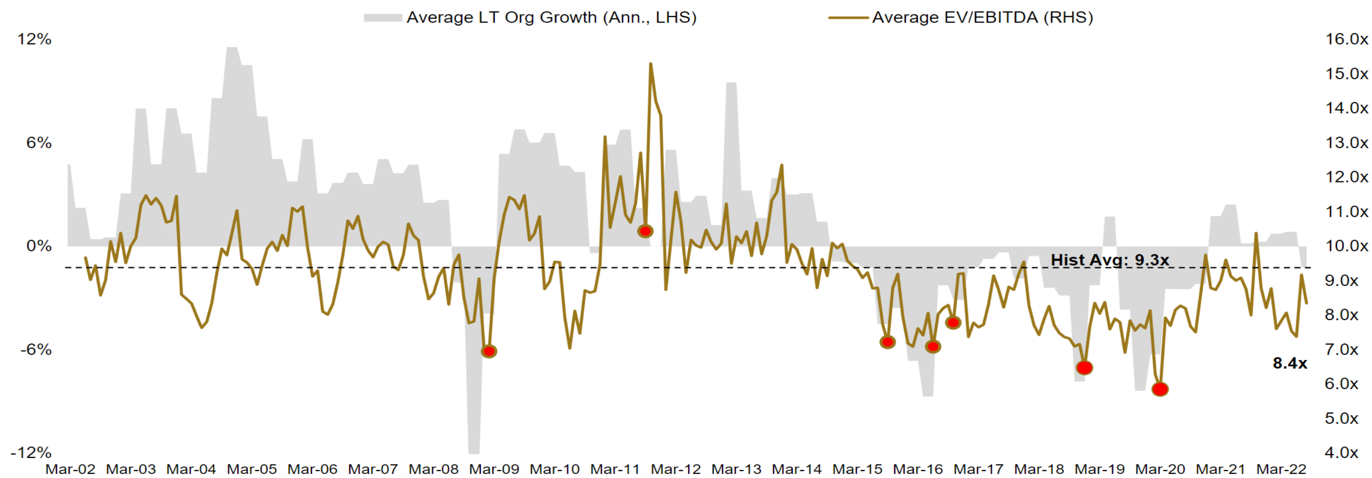
Indicators, Metrics & Stock Selection Framework

One specific ratio for the traditional names in Market Cap / AUM while also always paying attention to organic asset growth. Precedent M&A transactions over the last five years have struck in the 8-13x EV/EBITDA range and 11x on a median basis.

Asset managers are usually valued on a Price/Earnings, EV/EBITDA and EV/AUM basis. As a secondary metric, large asset managers with diversified businesses may also be looked at from a free cash flow yield perspective. Asset management valuation primarily focuses on Assets Under Management (AUM). A larger AUM means a larger fee base which means more revenues while incremental expenses do not scale as much. Accordingly, AUM growth is imperative for share price appreciation. However, the quality of AUM growth is even more important. AUM can grow organically because of 1) rising markets boosting the value of the assets managed – which can be looked at as beta exposure; 2) the outperformance of the asset manager versus its benchmark – which can be looked at as alpha generated and 3) net inflows via more investors giving the asset manager their money. Monthly AUM metrics are often announced and followed closely by analysts.

Valuation & Comps

Traditionals Historical EV/EBITDA (FY2) vs. LT Organic Growth Rate (ann.)



14/Nov/22			EPS CAGR (%)	Price/ Earnings (P/E)			EV/ EBITDA			Mkt Cap	Div Yield (%)		
Sub-Sector	Market Cap ($B)	EV ($B)	22-'24	2022E	2023E	2024E	2022E	2023E	2024E	% AuM	2022E	2023E	2024E
Traditional Asset Managers	199.4	207.8	1.4	11.6x	13.0x	10.9x	8.4x	9.3x	8.8x	1.4	3.6	2.9	2.8
Alternative Asset Managers	359.9	665.7	15.2	16.0x	14.3x	12.8x	16.2x	16.6x	10.7x	6.8	3.8	1.1	1.9
Brokers	234.1	264.0	14.2	17.5x	12.7x	12.0x	13.5x	10.6x	9.8x	2.2	0.4	0.4	0.5
Market Structure/Exchanges	213.5	224.4	2.7	20.5x	19.8x	19.4x	16.0x	15.3x	14.3x	n/a	1.6	1.2	1.3
Mean (Mkt Cap and EV = Total)	**$1,006.9**	**$1,361.8**	**8.4**	**16.4x**	**15.0x**	**13.8x**	**13.5x**	**12.9x**	**10.9x**		**2.3**	**1.4**	**1.6**
Median			**8.4**	**16.7x**	**13.7x**	**12.4x**	**14.7x**	**12.9x**	**10.3x**		**2.6**	**1.1**	**1.6**

14/Nov/22						Earnings Per Share (EPS)			EPS CAGR (%)	Price / Earnings (P/E)			EV / EBITDA			Mkt Cap	Div Yield
Company	Ticker	Rating	Price 14/Nov/22	Price Target	Upside (%)	2022E	2023E	2024E	22-'24	2022E	2023E	2024E	2022E	2023E	2024E	% AuM	2023E
Traditional Asset Managers																	
Affiliated Managers Group	AMG	NC	$152.50	NC	NC	19.08	18.83	21.84	7.0	8.0x	8.1x	7.0x	9.0x	9.7x	9.2x	0.8	0.0
AllianceBernstein	AB	NC	$40.03	NC	NC	2.81	2.61	2.88	1.3	14.2x	15.3x	13.9x	11.0x	12.1x	10.8x	1.7	6.5
Artisan Partners Asset Mgmt.	APAM	NC	$33.55	NC	NC	3.05	2.55	2.75	(5.2)	11.0x	13.2x	12.2x	8.4x	10.0x	8.8x	2.0	7.6
BlackRock Inc	BLK	OW	$741.15	$720	(2.9)	34.24	34.86	40.01	8.1	21.6x	21.3x	18.5x	15.3x	15.3x	13.5x	1.3	2.8
BrightSphere	BSIG	EW	$19.74	$19	(3.7)	1.70	1.50	1.75	1.6	11.6x	13.1x	11.3x	7.3x	8.3x	7.7x	0.9	0.2
CI Financial	CIX.TO	NC	$14.53	NC	NC	2.99	3.18	3.52	8.6	4.9x	4.6x	4.1x	6.9x	6.8x	6.3x	2.3	5.0
Cohen & Steers	CNS	NC	$64.99	NC	NC	3.68	3.34	n/a	n/a	17.7x	19.5x	n/a	12.8x	14.2x	13.0x	3.6	3.6
Federated Hermes	FHI	NC	$34.88	NC	NC	2.74	3.20	3.62	15.0	12.8x	10.9x	9.6x	8.5x	7.9x	8.1x	1.6	3.4
Franklin Resources	BEN	UW	$26.46	$19	(28.2)	3.07	2.29	2.55	(8.8)	8.6x	11.6x	10.4x	5.9x	7.5x	6.7x	1.0	4.6
Janus Henderson Group	JHG	EW	$26.11	$22	(15.3)	2.39	2.01	2.23	(3.5)	10.9x	13.0x	11.7x	7.5x	8.3x	7.4x	1.4	6.0
Invesco Ltd	IVZ	EW	$19.11	$14	(26.7)	1.65	1.55	1.81	4.6	11.6x	12.3x	10.6x	8.2x	8.8x	8.0x	0.6	4.0
T. Rowe Price	TROW	EW	$125.50	$100	(20.3)	7.78	6.33	7.26	(3.4)	16.1x	19.8x	17.3x	10.9x	12.8x	11.2x	2.2	4.0
Victory Capital Holdings	VCTR	UW	$31.68	$20	(36.9)	4.51	4.16	4.29	(2.4)	7.0x	7.6x	7.4x	8.5x	9.3x	9.0x	1.5	3.3
Virtus Investment Partners	VRTS	UW	$189.15	$134	(29.2)	25.51	20.81	22.16	(6.8)	7.4x	9.1x	8.5x	6.3x	7.0x	6.4x	0.9	3.6
WisdomTree	WT	EW	$5.22	$5.50	5.4	0.25	0.20	0.27	5.1	21.2x	25.9x	19.2x	7.6x	14.4x	11.3x	1.1	2.3
Mean (Market Cap and EV equals Total)					**(17.5)**				**1.5**	**12.3x**	**13.7x**	**11.6x**	**8.9x**	**10.2x**	**9.2x**	**1.5**	**3.8**
Median					**(20.3)**				**1.4**	**11.6x**	**13.0x**	**10.9x**	**8.4x**	**9.3x**	**8.8x**	**1.4**	**3.6**

Management Commentary

Blackrock (BLK) on its platform, flows and Macro trends…. "Our ability to deliver this customization at scale is a unique advantage, and it is during times of market uncertainty that the power of our platform becomes most evident. Despite the most challenging market backdrop in decades, BlackRock generated industry-leading long-term net inflows of $248 billion during the first 9 months of 2022, demonstrating the strength and stability of our globally-integrated multi-asset solutions-oriented platform. BlackRock's industry-leading organic growth is a direct result of the purposeful investments we have consistently made through market cycles. The diversification and stability of our platform has allowed us to pursue critical investment when others have been forced to pull back. But we also recognize that this market environment may require a different playbook. While we continue to have deep conviction in our strategy and the long-term growth of the global capital markets, we have begun to more aggressively manage the pace of certain discretionary spend. Demand for alternatives also continued, with $2 billion of net inflows and $4 billion of new commitments raised across our liquid and illiquid platform during the quarter. New illiquid commitments were driven by private credit and infrastructure. We now have approximately $37 billion of committed capital to deploy for institutional clients in a variety of alternative strategies, representing a significant source of future base and performance fees."

Ameriprise (AMP) on withstanding weaker equity markets…. "So for Ameriprise, the diversity and strength of our business allows us to deliver good outcomes even in challenging times, and you certainly saw that in our results this quarter. We continue to remain in strong client inflows and wealth management. And the rise in interest rates, the growth of the bank and the stability of the retirement protection businesses helped to more than offset the effect of depreciating markets and foreign exchange that impacted our asset management business. Despite the environment, we had good client flows as clients remained engaged. Total client flows were up 11% in the quarter to more than $11 billion. The mix of our flows reflect the environment we're in. We saw strong growth in brokerage, cash, certificates and other products."

OptionsHawk Executive Summary & Focus Stocks

Growth remains challenged as the pullback in financial markets pressures AUM levels, revenues and EPS. Stocks with more sustainable organic asset growth supported by exposure to key growth zones and diversified franchises that are highly scaled, retain greater expense flexibility, and strong balance sheets will outperform in the tougher 2023 market. Of the five $8B+ market cap traditional managers **Franklin (BEN)** looks to be the weakest as a potential short with it seeing outflows and exposure to fixed income pressures. **T Rowe Price (TROW)** at less than 10X EBITDA looks like the most attractively values with one of the higher EPS CAGRs and AUM gains and a better equity market could re-rate it higher. **Federated Hermes (FHI)** screens attractive among the small caps at 8.8X EBITDA with solid EPS growth and AUM inflows while **Focus Financial (FOCS)** is still one of the most intriguing growth stories in the industry. **Artisan (APAM)** fits the mold as a possible M&A target if there is consolidation. **AssetMark (AMK)** is a favorite that was written in depth in November for members and is seeing impressive growth building out its digital platform.

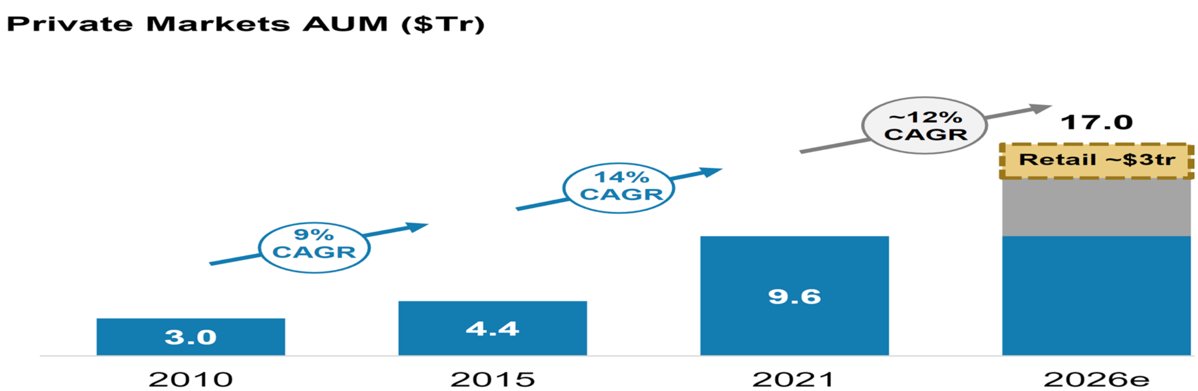
<u>Asset Management – Alternative Capital</u>

Components: BX, BAM, KKR, APO, ARES, CG, ARCC, IVZ, HLNE, OWL, VINP, PAX, STEP, IEP, TPG, BRDG, BBUC

International & Private Peers: EQT, Man Group, Partners Group, Eurazeo

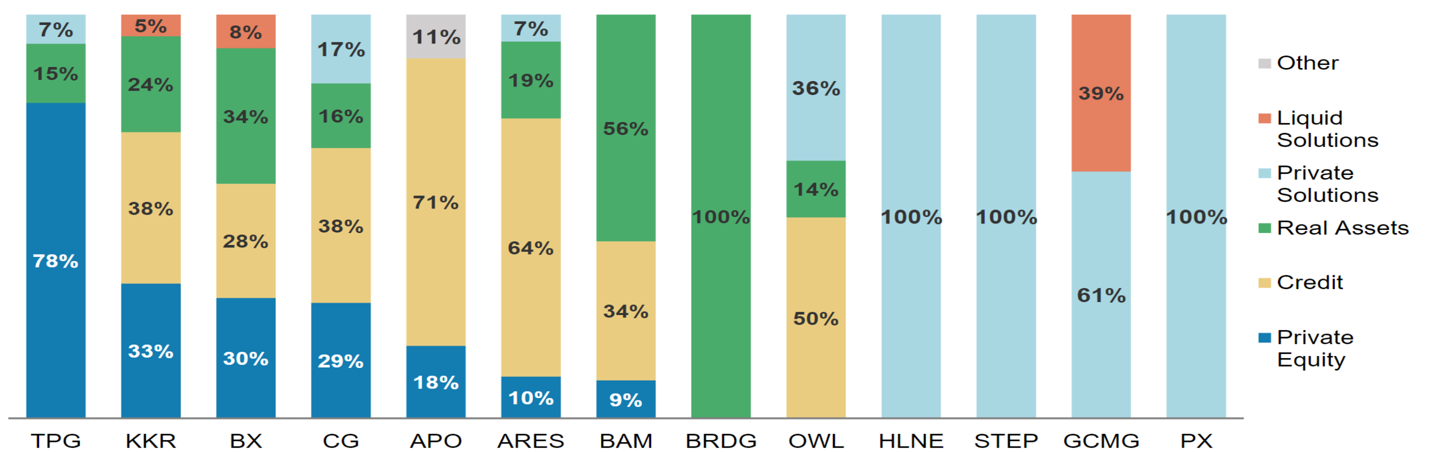
Intro

The private markets industry is set to grow at a 12% CAGR, to $17T AUM by 2026, despite recent dislocations in the market. The higher yield/rates backdrop, rising recession concerns, inflationary pressures, and tightening financial conditions have raised concerns about the durability of recent momentum and risks for the private markets growth outlook. Against a more challenging macro backdrop, concerns loom around: 1) a congested fundraising field, particularly in private equity, with LPs inundated with requests and pressured by a negative denominator effect after public markets depreciation; 2) portfolio investment performance, given the tech/growth sell-off, which also raises concerns around the reliability of private portfolio marks; 3) subdued realizations given muted capital markets activity; 4) a deployment slowdown impacted by tighter financial conditions and market volatility; and 5) risk-off retail sentiment that can weigh on demand and delay the secular allocation story.

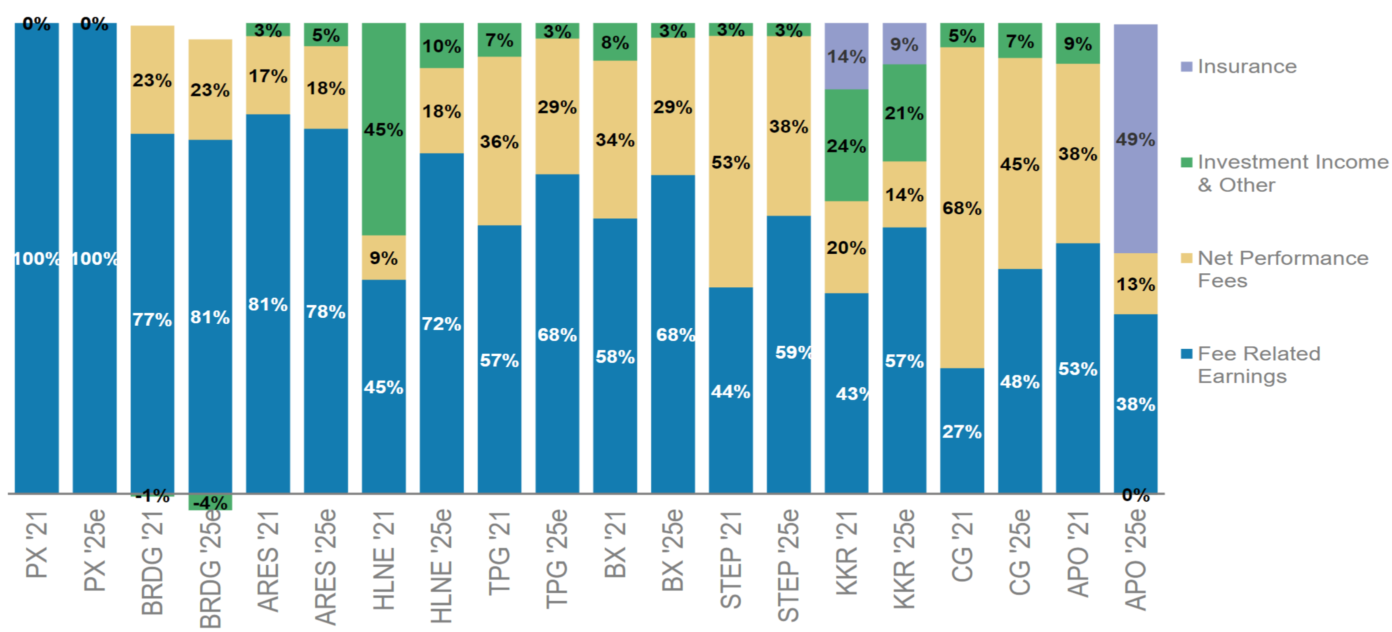


Industry Backdrop & Investment Considerations

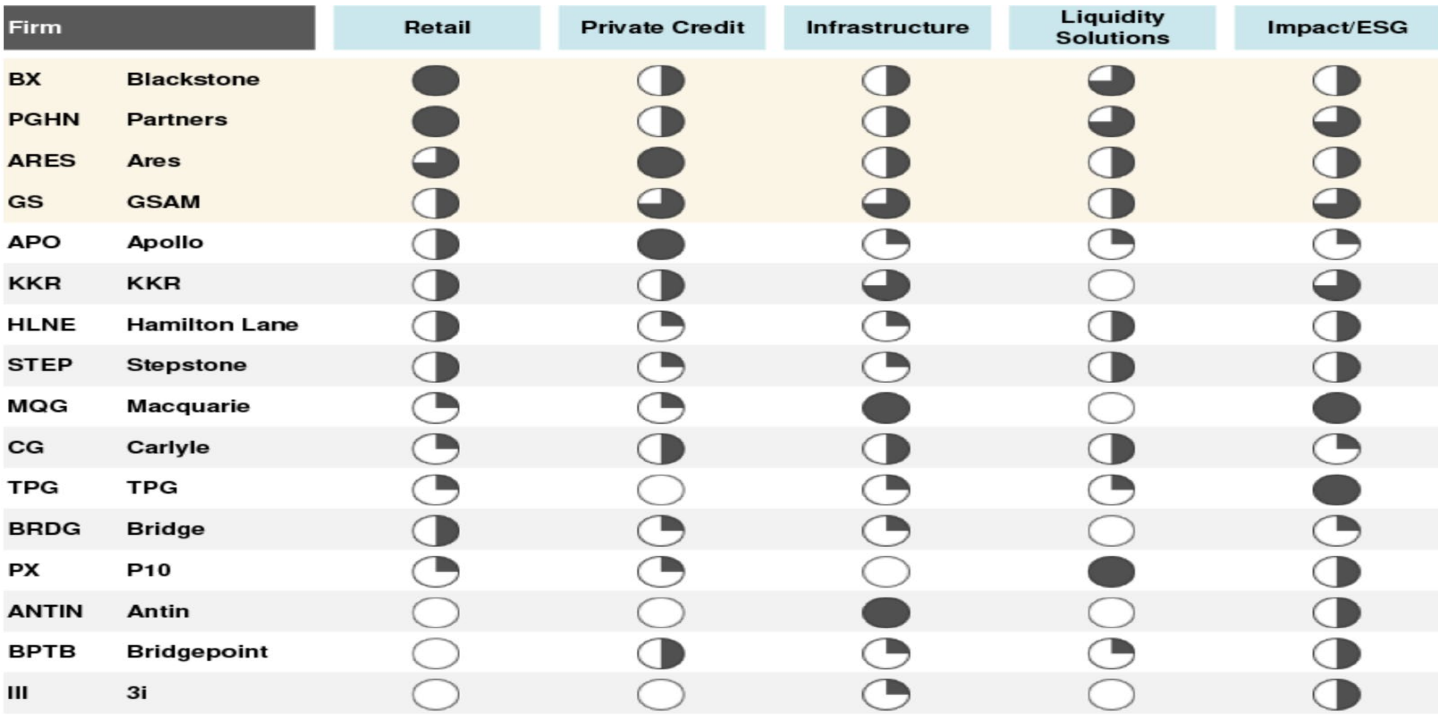
The acceleration in velocity of capital is driving faster fundraising/FRE growth and acceleration in incentive fee outlooks across the group. Multiple companies are showing records in fundraising, deployment, realizations and accrued incentive/carry balances.



Pre-tax Earnings Composition



Private markets have outperformed publics (private equity >700bps, private credit and infra >500bps) over the past 10 years, with a smoother ride that results in lower volatility. Positives include rising allocations from a ~$70tr retail TAM, a large opportunity set of assets, new growth engines, and private markets' strong track record versus public markets. For private market players, under-allocated wealth/retail investors offer a critical growth avenue as they move from a 3-5% allocation today toward 8-10%. While US LBO purchase multiples are at a record-high of 12x EBITDA, above the 10x seen over the past decade, the increase has primarily been driven by mix shift into faster growing companies and sectors that command higher-multiples.



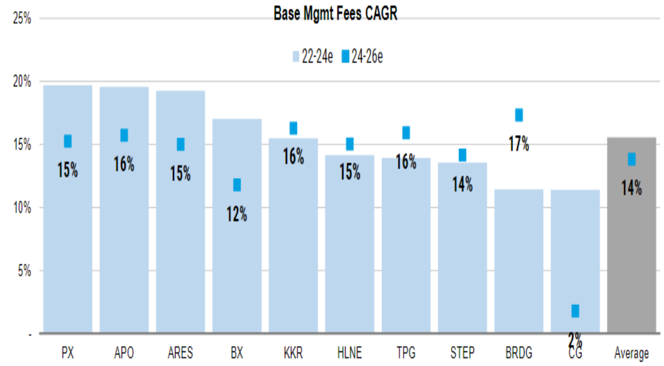
Indicators, Metrics & Stock Selection Framework

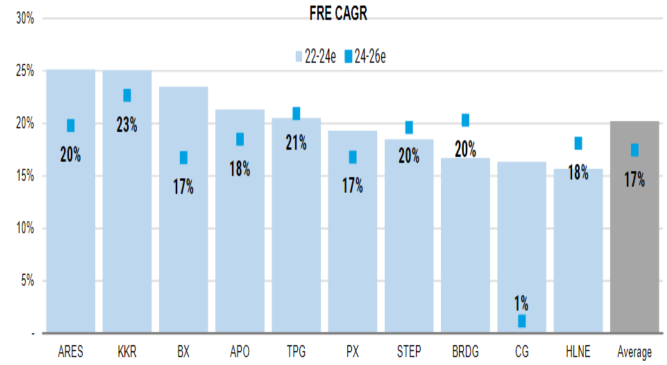
For the Alternative Managers, Price / Distributable Earnings (DE) and Distributable Earnings / Unit are two means of valuation while we also want to look at AUM and FEAUM CAGR as well as FRE Margins. A more complex measure is looking at Price (less of cash, investments and net accrued carry) / FRE.

A BAML study shows that relative performance ranks of 3- and 5-year track records is a key driver of flows and therefore asset manager earnings and valuations.

Valuation & Comps

14/Nov/22						Earnings Per Share (EPS)			EPS CAGR (%)	Price / Earnings (P/E)			EV / EBITDA			Mkt Cap %	Div Yield
Company	Ticker	Rating	Price 14/Nov/22	Price Target	Upside (%)	2022E	2023E	2024E	22-'24	2022E	2023E	2024E	2022E	2023E	2024E	AuM	2023E
Alternative Asset Managers																	
Apollo Global Mgmt	APO	EW	$62.57	$60	(4.1)	5.23	6.16	7.91	23.0	12.0x	10.2x	7.9x	10.8x	9.0x	7.1x	7.3	2.7
Ares Mgmt.	ARES	EW	$79.53	$82	3.1	3.07	3.31	4.76	24.4	25.9x	24.0x	16.7x	24.3x	20.6x	14.0x	7.3	3.7
Blackstone Group	BX	OW	$101.41	$113	11.4	4.98	4.22	6.55	14.6	20.3x	24.0x	15.5x	16.8x	18.8x	12.3x	13.0	3.5
Blue Owl Capital	OWL	NC	$12.43	NC	NC	0.53	0.69	0.83	25.9	23.7x	18.1x	14.9x	28.2x	20.8x	17.0x	14.6	4.7
Bridge Investment Group	BRDG	OW	$15.12	$21	38.9	1.10	1.10	1.30	8.7	13.7x	13.7x	11.6x	10.2x	9.9x	7.2x	4.6	6.2
Brookfield Asset Mgmt.	BAMa	NC	$45.63	NC	NC	3.09	3.61	4.13	15.7	14.8x	12.6x	11.0x	17.2x	39.2x	n/a	19.1	1.3
Carlyle Group	CG	EW	$28.90	$34	17.6	4.28	3.18	4.29	0.2	6.8x	9.1x	6.7x	5.9x	7.8x	5.7x	2.8	5.3
GCM Grosvenor Inc.	GCMG	NC	$8.76	NC	NC	0.51	0.65	0.63	10.6	17.1x	13.5x	14.0x	12.3x	9.8x	8.4x	2.8	6.2
Hamilton Lane	HLNE	EW	$72.57	$67	(7.7)	3.46	2.99	3.65	2.6	20.9x	24.2x	19.9x	16.2x	17.2x	15.1x	4.0	2.5
KKR & Co	KKR	EW	$53.62	$56	4.4	3.88	3.60	4.66	9.6	13.8x	14.9x	11.5x	11.5x	12.0x	9.2x	9.7	1.3
Sculptor Capital Mgmt	SCU	NC	$8.71	NC	NC	1.22	2.55	2.80	51.3	7.1x	3.4x	3.1x	n/a	n/a	n/a	1.4	11.3
P10 Inc.	PX.N	OW	$9.72	$15	54.3	0.77	0.91	1.10	19.6	12.6x	10.6x	8.8x	12.7x	9.9x	8.4x	6.4	1.2
Stepstone Group Inc	STEP	EW	$30.74	$30	(2.4)	1.37	1.39	1.84	16.1	22.5x	22.1x	16.7x	19.7x	16.6x	12.4x	4.5	4.3
TPG Inc.	TPG.O	EW	$38.52	$30	(22.1)	1.87	1.77	2.13	6.5	20.5x	21.8x	18.1x	16.5x	18.1x	15.9x	9.7	3.8
Mean (Market Cap and EV equals Total)					**9.4**				**16.3**	**16.6x**	**15.9x**	**12.6x**	**15.6x**	**16.1x**	**11.0x**	**7.7**	**4.2**
Median					**3.8**				**15.2**	**16.0x**	**14.3x**	**12.8x**	**14.4x**	**14.3x**	**9.2x**	**6.8**	**3.7**





Management Commentary

Blackstone (BX) on retail allocations…. "From a channel perspective, Morgan Stanley predicts the greatest growth among individual investors, with allocations to alternatives from high net worth investors more than doubling in 5 years to 8% to 10% of their portfolios. Blackstone is the clear leader in this channel with the largest market share among alternative managers. We are in the early innings of penetrating new channels and markets with enormous potential. The firm's earnings power continues to expand, concentrated in the highest quality earnings. Even though the investment climate is challenging, we have the confidence, the resources and the loyalty of our customers and our people. We continue to develop our franchise for the benefit of all of our constituencies."

Brookfield (BAM) on rates and capital access…. "Interest rates should be set to peak in the next 6 months, and many major economies around the world look like they will experience a recession with a central bank-induced slowdown. Rates are then set to stabilize and should eventually decline. Dislocation in the financial market has meant access to capital has become less available for many. Fortunately, we are well positioned to thrive in the current environment with a record level of investable capital of over $125 billion and more importantly, the skills to navigate these types of markets and execute transactions. Fundraising continues to go extremely well with a significant amount of capital coming in for our flagship funds, but also for our complementary strategies. We continue to see clients consolidate the number of managers that they allocate capital to."

Apollo (APO) on the environment for Alts…. "This is an amazing time for alts, alternatives, particularly for credit. Investors have now discovered that everything is correlated to the Fed. And they are also discovering that most, if not all, of last decade's investment acumen was really nothing other than market beta and in some cases, nothing other than levered market beta. When I think about the market backdrop we are in today, alternatives should shine. After all, as an industry, we exist because we produce excess return per unit of risk. And for the first time in a decade, investors are asking not just about the reward, but about the risk associated with investments. Alternatives offer diversification, in many instances, downside protection and an escape from correlation and indexation. That is the backdrop that I see for our industry. For us, this is a particularly good time. We did not chase a hot dot of growth at any price over the past decade. Our business continues to be guided by 3 fundamental principles: purchase price matters, excess return per unit of risk and aligned investing."

OptionsHawk Executive Summary & Focus Stocks

Macro conditions turned less constructive for the private markets industry in 2022. The higher yield/rates backdrop, rising recession concerns, inflationary pressures, and tightening financial conditions have raised concerns about the durability of recent momentum and risks for the private markets growth outlook. Despite these near-term headwinds there are strong long-term drivers that suggest the industry will recover and be a strong investment. The group may see downward revisions early in 2023 that provide a buying opportunity. Among the seven largest players, **Apollo (APO)** stands out as cheap at 11X EBITDA despite having comparable, and often better, metrics than peers though it does have 70% exposure to credit markets. **Carlyle (CG)** is the other favorite, also trading cheap at less than 9X. **Vinci Partners (VINP)** is a speculative name with a $540M market cap that has impressive growth with the risk of being a Brazilian company. **Bridge (BRDG)** is a name at risk with its focus on real estate. **StepStone (STEP)** is the preferred small cap name in this group and its new dividend policy may expand its investor base.

Asset Management – Brokers & Exchanges

Resources: Bondticker

Components: SCHW, XP, CME, ICE, MKTX, NDAQ, TIGR, TW, CBOE, XP, IBKR, BGCP, COIN, HOOD, FUTU, ARBK

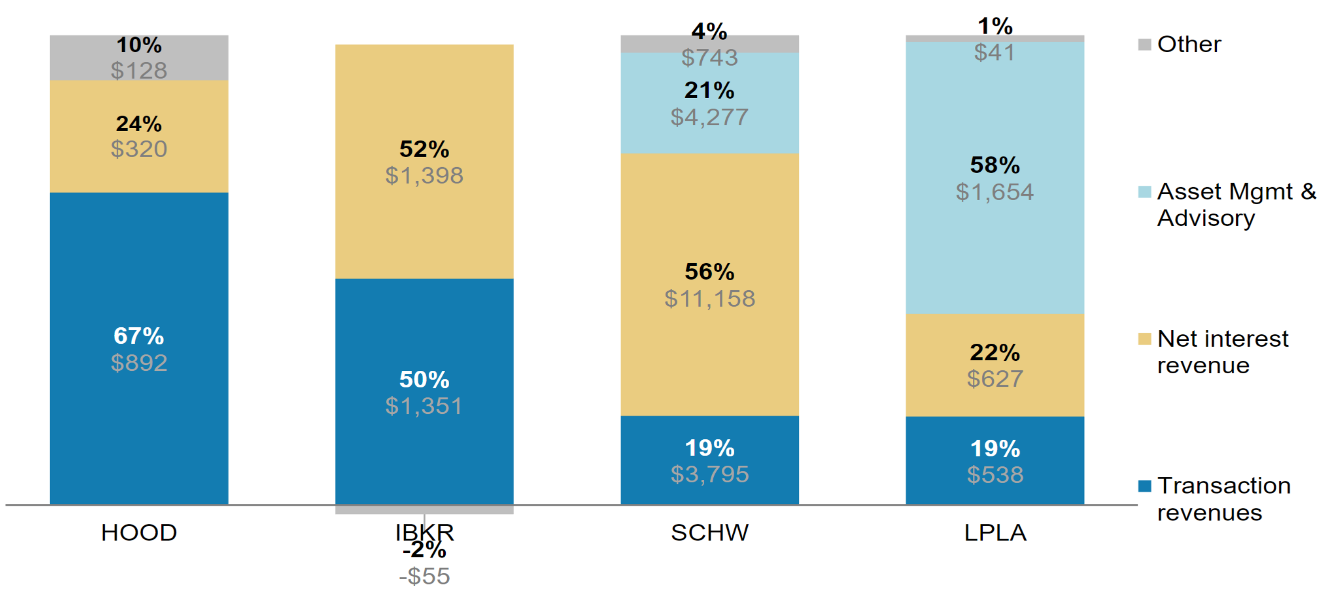
International & Private Peers: Toronto Stock Exchange, London Stock Exchange, Euronext, Hong Kong Exchange, Shanghai Exchange, Tokyo Exchange, Singapore Exchange, Japan Exchange Group, B3

Intro

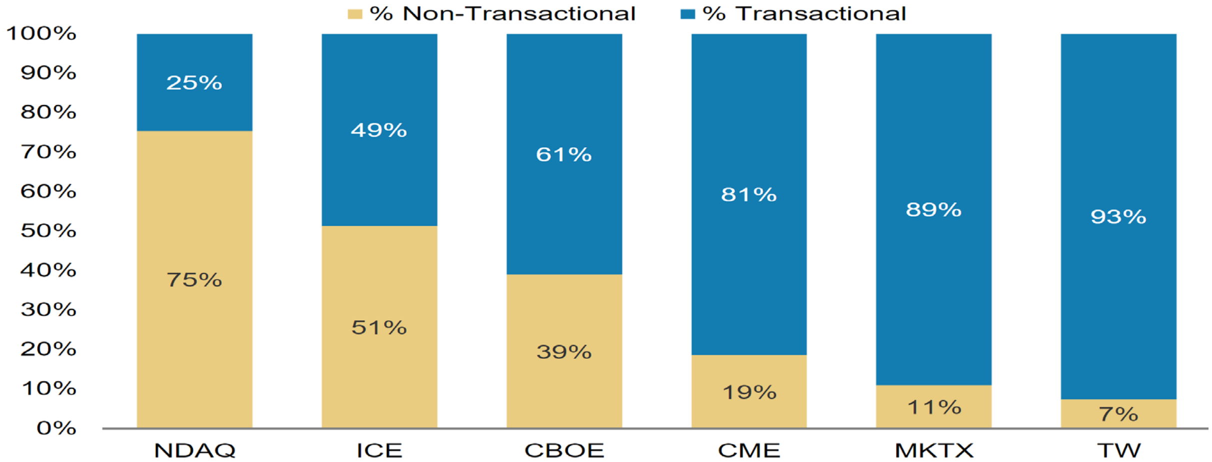
The Brokers & Exchanges Industry is cyclical and comprised of two distinct types of businesses. Brokerages, also known as financial services companies, strive to meet the investing needs of their clients, and exchanges facilitate securities trading.

A more challenging macro backdrop with elevated market volatility should support the outlook for trading volumes. Skew to transactional revenues has the potential for outsized growth and greatest upwards bias for estimate revisions among the exchanges. Cyclical uplift to trading activity looks poised to persist in an uncertain backdrop as market participants seek to express diverging views and corporates have increasing hedging needs. Brokers that benefit from higher rates like SCHW/LPLA should also continue to outperform.

Industry Backdrop & Investment Considerations



The main theme in the Exchange group is migration to tech-driven recurring revenue streams and pockets of structural growth in transactional revenues. Core revenues continue to decline given weaker spread-based revenues (rate pressure), fee-based revenues (increased fee waivers, but higher average markets), and transaction revenues ($0 commissions, but elevated trading activity).

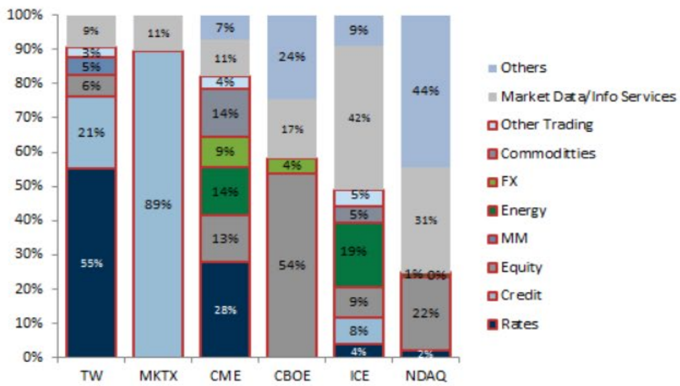


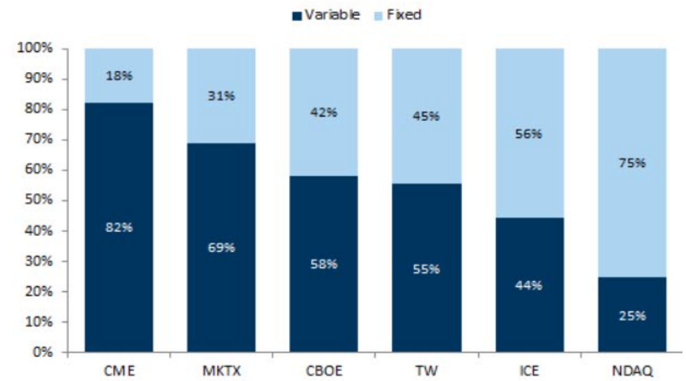
Many of the exchange names are seeing a positive margin mix shift with data & analytic service offerings. Secular trends including market automation, passive investing and regulation are reshaping the capital markets landscape and driving strong customer demand for data and technology solutions. The group often performs well in times of Macro uncertainty and increased volatility, a defensive group. Extension into the information services sector offers highly recurring revenues that command higher valuations. It enables exchanges to leverage their core expertise in operating digital networks, adding content and digitizing networks, managing vast quantities of data, and monetizing their corporate and sell-side broker/dealer relationships to cross-sell additional products and services.

In general, the end markets of the legacy exchange businesses are penetrated and mature, with some exceptions including analog-to-digital conversion within cash credit and rate swaps, and growth in index products. As such, growth in transactional revenue streams is more limited and cyclical, and therefore at the mercy of macro variables.

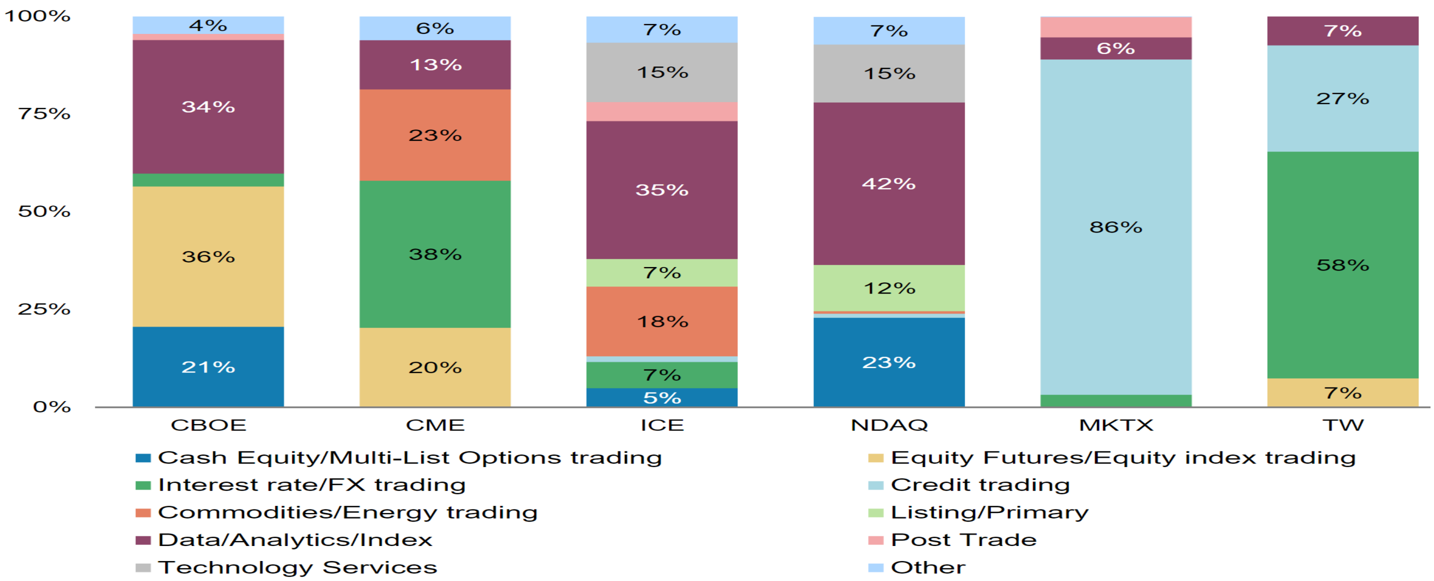
Exchanges' businesses remain attractive and should provide valuation support. They have (1) scaled operations with strong moats, (2) significant market share in key futures and index options products that face less competitive pressure, (3) high margins (>60% EBITDA margins), and (4) nearly 100% free cash flow conversion of adjusted earnings with high levels of capital return. Strong cash flow generation from legacy cash cow businesses enables reinvention and can fund organic and inorganic extensions into adjacencies to create new revenue pools and enhance growth prospects.

Electronification of fixed income trading is one of the most robust themes across Capital Markets. As the move toward e-trading unfolds, turnover rates tend to rise, creating an amplifying effect on volumes. Increased regulation has been one of the main drivers of trading moving towards electronic execution, particularly within derivatives.





Secular growth tailwinds include Fixed Income market data from growth into passive, Investment data/analytics, ESG, Anti-financial crime and trade surveillance, Index Licensing, and Mortgage Workflow Technology with the shift to digital. Institutions are focused on expanding crypto offerings and increasing accessibility for retail clients while 24/7 U.S. equity trading, technology enhancements, ESG, and ETF trading are also on top of mind.



Indicators, Metrics & Stock Selection Framework

In the investment brokerage group, DARTs is a group-specific metric released monthly, daily average revenue trades. The group also tends to benefit from strong markets and increased trading activity. Net Interest Margin, Net New Assets, and Total Client Assets are other observable metrics. Increased capital flexibility should lead to dividend raises, buybacks, and further M&A.

P/E, EV/EBITDA, Organic Revenue Growth, EBITDA Growth, EBITDA Margins

Trading Volumes

Valuation & Comps

14/Nov/22						Earnings Per Share (EPS)			EPS CAGR (%)	Price / Earnings (P/E)			EV / EBITDA			Mkt Cap %	Div Yield
Company	Ticker	Rating	Price 14/Nov/22	Price Target	Upside (%)	2022E	2023E	2024E	22-'24	2022E	2023E	2024E	2022E	2023E	2024E	AuM	2023E
Brokers																	
Charles Schwab	SCHW	OW	$76.47	$104	36.0	3.92	5.15	5.76	21.3	19.5x	14.8x	13.3x	13.6x	10.8x	9.8x	2.1	1.2
Interactive Brokers	IBKR	NC	$73.71	NC	NC	3.93	5.36	5.29	16.0	18.8x	13.8x	13.9x	22.5x	15.1x	14.6x	10.6	0.5
LPL Financial Holdings	LPLA	OW	$230.84	$281	21.7	11.74	20.21	20.80	33.1	19.7x	11.4x	11.1x	13.5x	8.3x	8.4x	1.7	0.4
Robinhood Markets	HOOD	EW	$9.56	$13	36.0	(1.07)	(0.24)	(0.12)	NM	NM	NM	NM	NM	20.8x	19.1x	13.1	0.0
Focus Financial Partners, Inc.	FOCS	UW	$39.00	$36	(7.7)	4.35	4.06	4.97	6.9	9.0x	9.6x	7.8x	10.7x	9.8x	8.2x	n/a	0.0
AssetMark Financial Holdings	AMK	NC	$23.59	NC	NC	1.74	1.98	2.17	11.8	13.6x	11.9x	10.9x	8.7x	7.7x	6.9x	2.1	0.0
Raymond James Financial	RJF	OW	$121.84	$121	(0.7)	7.51	9.04	9.50	12.4	16.2x	13.5x	12.8x	n/a	10.6x	9.9x	2.3	1.3
Mean (Market Cap and EV equals Total)					**17.1**				**16.9**	**16.1x**	**12.5x**	**11.6x**	**13.8x**	**11.9x**	**11.0x**	**5.3**	**0.5**
Median					**21.7**				**14.2**	**17.5x**	**12.7x**	**12.0x**	**13.5x**	**10.6x**	**9.8x**	**2.2**	**0.4**
Market Structure																	
CBOE Holdings	CBOE	OW	$118.62	$150	26.5	6.91	7.15	7.16	1.8	17.2x	16.6x	16.6x	13.4x	13.0x	13.1x	n/a	1.7
CME Group	CME	EW	$173.90	$208	19.6	8.07	8.43	8.49	2.6	21.6x	20.6x	20.5x	18.6x	18.3x	17.5x	n/a	4.6
Coinbase Global Inc.	COIN	NC	$53.22	NC	NC	(11.54)	(5.83)	(2.47)	NM	NM	NM	NM	NM	NM	NM	12.6	0.0
Intercontinental Exchange	ICE	EW	$104.10	$116	11.4	5.37	5.47	5.66	2.7	19.4x	19.0x	18.4x	12.9x	12.7x	12.2x	n/a	1.6
MarketAxess	MKTX	EW	$266.59	$299	12.2	6.46	7.40	7.88	10.4	41.3x	36.0x	33.8x	25.9x	23.1x	21.5x	n/a	1.1
Nasdaq	NDAQ	OW	$66.04	$73	10.5	2.66	2.87	3.07	7.5	24.8x	23.0x	21.5x	19.0x	17.6x	16.7x	n/a	1.3
TMX Group	X.TO	NC	$132.98	NC	NC	7.11	7.40	7.90	5.4	18.7x	18.0x	16.8x	12.4x	12.3x	11.9x	n/a	2.6
TradeWeb Markets	TW	OW	$58.19	$85	46.1	1.90	2.26	2.66	18.4	30.7x	25.7x	21.9x	20.7x	18.1x	15.6x	n/a	0.5
Virtu Financial	VIRT	UW	$22.39	$20	(10.7)	3.32	2.65	2.73	(9.3)	6.7x	8.5x	8.2x	5.1x	6.2x	6.1x	n/a	4.3
Mean (Market Cap and EV equals Total)					**16.5**				**4.9**	**22.5x**	**20.9x**	**19.7x**	**16.0x**	**15.2x**	**14.3x**		**2.0**

Management Commentary

CBOE (CBOE) earnings call on derivatives volumes, trading trends and increased trading hours…"Our Derivatives business delivered another strong quarter, driven by robust performance in our index options franchise, specifically SPX options, as well as a solid increase in multi-listed options. Record activity across our SPX complex helped drive a 67% year-over-year increase in average daily volume in the SPX contract for the quarter. One of the key themes discussed at the conference was the increased usage of shorter-dated options. The strong volume in SPX options activity I noted earlier was driven by trading in our short-dated SPX Weeklys options as investors navigated rapidly changing market conditions. We've also seen volumes in Mini-SPX increased by over 50% since adding Tuesday and Thursday expirations last month. Additionally, we've seen a surge in users opening and trading positions on the same day as contract expiry. These zero days to expiration contracts have become the fastest-growing segment of the U.S. Options business. Adding Tuesday and Thursday expirations for SPX and Mini-SPX has enabled market participants to trade zero days to expiration contracts any day of the week. Volume in zero days to expiration options has increased steadily month-over-month this year, reaching a record ADV of 1.2 million contracts in September, which represented over 44% of total SPX options volume. Our efforts to expand trading hours in SPX and VIX options to 24 hours a day, 5 days a week have translated to greater client adoption and incremental volumes. In the third quarter, ADV and global trading hours for SPX options increased 219% year-over-year, and VIX options increased 71%."

CME Group (CME) on trends in the commodity business…. "U.S. is producing nearly 12 million barrels of oil a day and exporting record levels of crude and refined products. The U.S. is the marginal supplier of crude oil to Europe and Asia, which positions WTI and a refined product benchmarks well for the long term beyond the current supply and price dislocation. Similarly, the U.S. of the world's largest producer and exporter of natural gas, boosted by increasing liquified natural gas exports priced off Henry Hub futures markets. Additional LNG facilities are coming online in the U.S. in the medium term, which further bolsters Henry Hub as the benchmark for the global natural gas market for decades to come. As the market transitions through the short-term disruptions caused by the war in Ukraine, we believe that we have the strongest portfolio of risk management tools in the global energy and environmental products markets, which positions us well to grow this asset class over the long term. In agricultural products, CME's markets serve as the benchmarks for global price discovery in grains, oilseeds, livestock, dairy and lumber. We saw increased customer activity in the third quarter with average daily volume of 1.2 million contracts, up 6% year-over-year with particular strength in options. Buy side and bank customers are our strongest performing client segments this year, and our strongest global growth is coming from Latin America. Turning to Metals. Third quarter average daily volume increased 4% to 498,000 contracts, led by a 20% growth in September. CME Group's aluminum futures continue to see strong adoption by both commercial and financial market participants. Given the customer growth we are seeing, the adoption of COMEX Aluminum by top metals broker, Marex, and the success we've had in getting our reference prices to be included in physical procurement contracts from commercial customers, we feel that we are at an inflection point for growth in this important market."

OptionsHawk Executive Summary & Focus Stocks

Schwab (SCHW) remains a top pick in this group seeing NIM expansion and the Ameritrade deal will continue to fuel upside to numbers. SCHW's leadership position within the institutional channel (RIA custodian) should benefit from secular shift toward independent financial advice. **CBOE (CBOE)** is undervalued in the Exchange group considering the shift towards short-dated options and is a more defensive play to withstand a tougher Macro with 70% of revenues transactional and a beneficiary of volatile markets. **Tradeweb (TW)** is the high growth, high multiple favorite that has a large opportunity ahead and continues to deliver strong numbers. The smaller names in this group are risky with lower margins than larger peers. **Coinbase (COIN)** likely remains in a downward revision cycle until some confidence is restored to the crypto industry and trading volumes recover.

<u>Asset Management – Capital Markets – Regional Wealth Managers & Trust Banks</u>

Components: JEF, RJF, NMR, LPLA, VIRT, SF, LAZ, HLI, EVR, PJT, MC, FRHC, PIPR, COWN, PWP, BK, STT, NTRS, PX, RILY

International & Private Peers: Julius Baer, BNP Paribas, Edward Jones, Pictet Wealth Mgmt., LGT Group, J. Safra Sarasin, DBS Wealth Mgmt., EFG International, Indosuez Wealth Mgmt., Daiwa, Lombard Odier, Nomura, China Merchant Bank

Intro

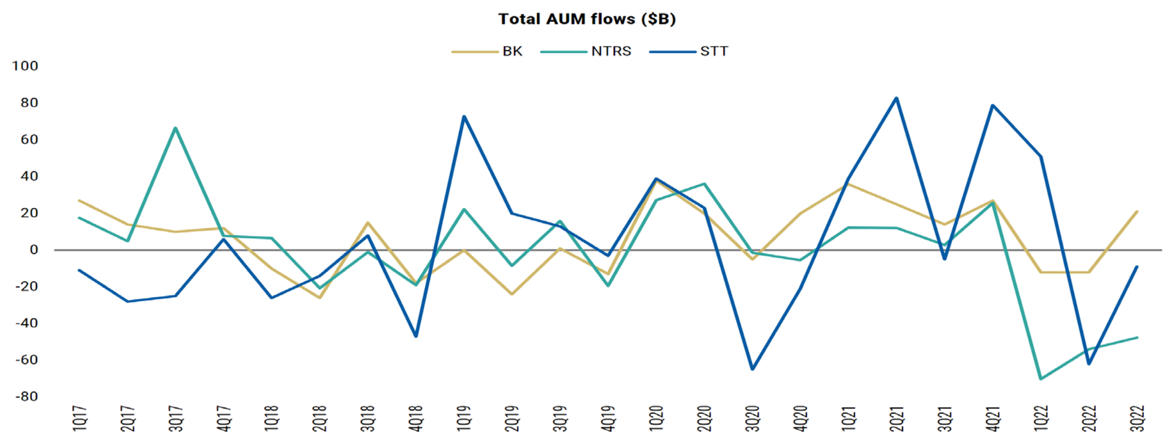
Trust Banks results have been underscored by significant NII upside, better than feared capital levels and relatively inline fees. While higher short-term rates is still a tailwind, NII growth has largely peaked. Lower market levels and moderating industry volumes create near-term risks to fees. Although deposit outflows and higher deposit betas will remain a headwind, repricing of the group's securities portfolios is likely to be a bigger tailwind than originally expected. Retail Brokers LPLA and RJF are seeing NII upside along with NTRS and BK in the Trust Banks.

Traditional Managers face meaningfully worse than expected operating margin compression into 2023 amid revenues headwinds and limited expense flex vs prior downturns. Headwinds in 2023 across capital markets include (1) accelerating pressure on asset prices across equities and most of fixed income, (2) anemic deal activity, with a notable decline in sponsor-led transactions, (3) stronger USD, (4) mixed volumes environment as market uncertainty is weighing on cash products, offset by a much stronger backdrop in derivatives (Rates, Equities, FX), and (5) limited expense flex. Macro conditions for the Brokers continue to diverge, with a higher rates backdrop in the near-term creating upside to cash-related revenues, while lower equity markets and marginally slower NNA will likely impact advisor production (brokerage + advisory revenues).

Industry Backdrop & Investment Considerations

The global wealth management industry is estimated at $1.26 trillion in 2021 and seen growing at a 9% CAGR to $1.755 trillion in 2025. The industry has been investing heavily in technology to add to analytic capabilities and broaden the depth of offerings to clients which along with rising regulatory costs has pressured the bottom-line. Online brokers and robo-advisors are disrupting the wealth management industry. It's been predicted that between $2.2 trillion and $3.7 trillion in assets will be managed with the support of robo-advisory services. Fees will be under continued pressure amid the ongoing push for greater transparency and comparability. The separation between alpha and beta will accelerate as investors increase their investment allocation to passive products in search of low fees and broad beta market exposure.

Assets under management in the SAAAME (South America, Asia, Africa and the Middle East) economies are set to grow faster than in the developed world. Growth in assets will be driven by three key trends: the government-incentivized shift to individual retirement plans; the increase of high-net-worth-individuals (HNWIs) from emerging populations; and the growth of sovereign wealth funds (SWFs).



Yield Curve (+ on higher rates), Trading Activity, Capital Returns

Indicators, Metrics & Stock Selection Framework

Comparable trading multiples include P/E, EV/EBITDA, Mkt Cap to AuM, Dividend Yield for traditional & alternative asset managers, brokers, and market infrastructure/exchanges.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	Revenue CAGR (FY0-FY2)	ROE	FCF Margin	AUM 2 Year Change
Regional & Trust								#VALUE!	
BK	Bank of New York Mellon Corp	36.3B	8.60X	0%	4.43%	3.12%	8.59%	84.30%	27.43%
STT	State Street Corp	29.5B		11%	4.33%	3.14%	10.61%	143.87%	38.58%
RJF	Raymond James Financial Inc	24.4B		8%	10.22%	8.96%	19.35%	-150.65%	13.52%
NTRS	Northern Trust Corp	18.3B		22%	7.99%	3.89%	13.59%	-54.61%	30.52%
LPLA	LPL Financial Holdings Inc	17.6B	10.97X	10%	0.27%	11.15%	52.98%	94.41%	75.83%
NMR	Nomura Holdings Inc (ADR)	11.5B	72.99X	-7%	53.3%	(2.588%)	2.16%	-51.81%	37.68%
JEF	Jefferies Financial Group Inc	8.3B	22.34X	117%	17.28%	0.18%	10.76%	75.70%	
HLI	Houlihan Lokey Inc	6.4B	11.72X	53%	13.85%	(1.207%)	23.12%	14.67%	
SF	Stifel Financial Corp	6.4B	33.07X	61%	9.28%	6.84%	11.65%	50.01%	41.51%
EVR	Evercore Inc	4.9B	5.37X	83%	10.85%	2.19%	27.57%	54.75%	13.95%
LAZ	Lazard Ltd	4.0B	7.14X	40%	15.16%	(0.406%)	66.74%	57.51%	10.27%
FRHC	Freedom Holding Corp	3.7B		60%		11.7%	33.22%	192.52%	
VIRT	Virtu Financial Inc	3.6B	11.88X	-23%	4.02%	(3.734%)	31.11%	39.96%	
MC	Moelis & Co	3.2B	12.32X	96%	26.57%	8.91%	25.81%	53.27%	
PJT	PJT Partners Inc	3.0B	13.84X	-8%	11.03%	9.5%	118.9%	60.11%	
PIPR	Piper Sandler Companies	2.4B		125%	11.64%	8.53%	16.37%	16.27%	
RILY	B Riley Financial Inc	1.2B		108%			55.84%	-6.88%	
PX	P10 Inc	1.2B	13.63X	-161%	18.53%	20.74%	24.84%	40.86%	
COWN	Cowen Inc	1.1B	32.70X	-3%	28.7%	11.26%	8.34%	24.22%	
PWP	FinTech Acquisition Corp	0.8B						#VALUE!	

Management Commentary

Bank of NY (BK) on market liquidity and operating costs…. “And more broadly, it's clear that market liquidity continues to be challenged in some markets more so than in others. As we sit here today, most markets have continued to function in a relatively orderly fashion, trades are settling and fails and overdrafts are at fairly normal levels. But clearly, risks are elevated and the system feels more fragile than it was a few months ago. While the environment is quite uncertain, our platform of trust and innovation is very much in demand by our clients. As their cost pressures rise, we are seeing a lot of interest in engaging with us to review operating models. The scale of our platforms should allow us to lower operating costs for our clients, enabling them to focus on their core strengths. Clearance and Collateral Management delivered strong growth on the back of higher U.S. clearance volumes, as market volatility continues to drive secondary trading activity in U.S. treasuries. In fact, in September, settlement volumes were the highest they've been since March of 2020.”

Raymond James (RJF) on interest rate impact, “As evidenced this quarter, with a sharp increase in net interest income in RJBDP fees, we are well positioned for the continued rise in short-term interest rates with diverse and ample funding sources, strong loan growth, high concentration of floating rate assets and ample balance sheet flexibility given solid capital ratios which are well in excess of regulatory requirements. Net revenue growth was mainly due to higher loan balances and significant expansion of the Bank's net interest margin to 2.91% for the quarter, up 50 basis points from the preceding quarter, once again, reflecting the flexibility and floating rate nature of our balance sheet. While this headwind exists, we expect SumRidge Partners to enhance our current position in the rapidly evolving fixed income and trading technology marketplace. And SumRidge typically benefits from elevated rate volatility.”

OptionsHawk Executive Summary & Focus Stocks

Trust Banks are highly correlated to the market returns and of the three large names **State Street (STT)** screens the strongest across key metrics and positioned for the strongest ROTCE in 2023. For the mid-cap advisors **Raymond James (RJF)** looks to be positioned best for sustained growth while also buying back shares and seeing upside to margins. **Stifel (SF)** is the most impressive of the small caps and is seeing much stronger

AUM growth than peers. **Piper Sandler (PIPR)** screens as the most likely M&A target while **P10 (PX)** is a newer small cap name worth a closer look as it looks attractive on the surface.

Financial Services – Credit Cards & Payment Gateways

Components: AXP, COF, DFS, V, MA, PYPL, SQ, MQ, AFRM, NU, PAYO, BFD

International & Private Peers: Adyen, Stripe, Checkout.com, Due, Bit Pay, GoCardless, Payline Data, Beacon Payments, Blue Pay, Card Connect, Circle, Clover, Razor Pay

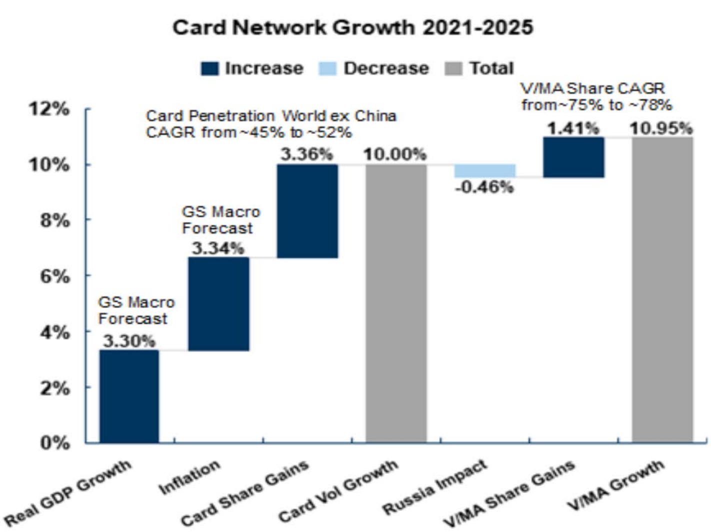
Intro

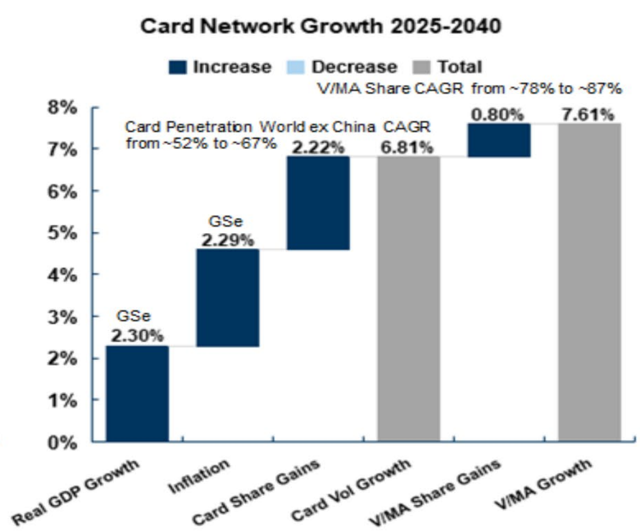
Despite the headwinds to consumer spending the credit cards companies have yet to see any major signs of a slowdown nor are there any issues with credit quality. The three big payment networks are near flat YTD while PYPL/SQ came under pressure with high valuation names and the BNPL segment came under heavy pressure due to the long-duration businesses. Travel has been a major source of strength for spending and cross-border is still improving while China remains uncertain. Domestic spending has remained resilient across nondiscretionary and discretionary channels and elevated deposit levels continue to support the spending outlook. Persistent inflation is a benefit to V/MA given ~2/3 of revenue is tied to volumes while FX volatility is the greater headwind. Personal consumption expenditure (PCE) growth and continued shift to card payments will continue to be the primary network growth drivers (particularly with cross-border recovery as a more specific near-term factor).

High inflation, rising unemployment, and less excess savings drive a potential consumer cash flow squeeze so credit metrics will need to be watched closely to monitor risks. Currently, credit card losses are running ~2%, well below a normalized rate of 3.5-4.0% for today's unemployment rate environment.

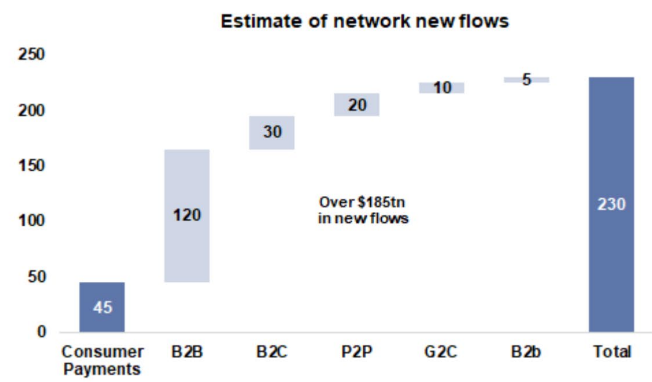
Industry Backdrop & Investment Considerations

The long-term bull theses of electrification of paper spending remains intact with an estimated $12T cash spending opportunity helping to support 11% card network volume growth through 2025 and ~8% growth through 2040.

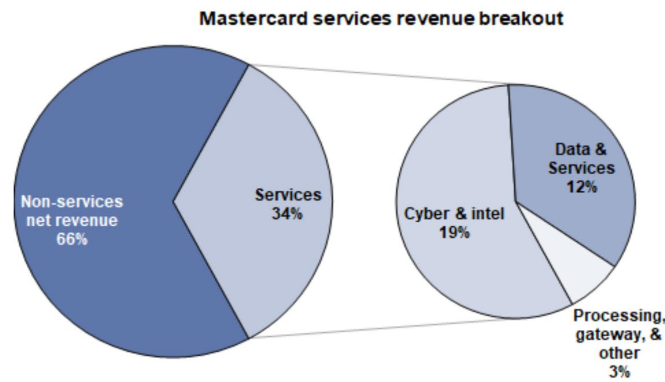




New flow opportunities and value added services are also seen as major opportunities over the long-term. Visa and Mastercard are investing to drive incremental growth from other services and non-debit and credit payment volumes. Within that incremental revenue and service group, one can include revenue derived from open banking initiatives, with the companies monetizing data lookup facilitated by open banking links plus enhancements (primarily security and verification) to existing account-to-account transactions (e.g. ACH). V and MA will be net beneficiaries of open banking.



Source: Company data



Source: Company data

Spending patterns remain consistent with macro headwinds still having little discernible impact while the cross-border recovery has slowed. Leading card issuers - JPM, BAC, WFC, USB, and C - reported weighted average card volume growth of 10.6% in 3Q, driven by 16% credit growth and 4% debit growth. Additional progress in the cross-border recovery is the most likely driver of revenue upside in '23, with a re-opening in China a key catalyst in particular to watch. For now, cross-border travel trends seem durable based on largely positive airline management commentary. Travel PCE data from the last four recessions shows travel spend generally falls ~5-10% in a normalized downturn but the current environment is seeing an ongoing post-pandemic demand recovery that could result in less of an impact. Recent moves in foreign exchange markets have caused considerable impacts to revenues generated overseas.

V/MA's domestic US volumes are well positioned even in a recessionary environment from two angles: 1) Inflation pressure on higher income consumers could be overestimated. Consumers making more than $100K represent ~60% of all spend, and within these higher earners, spending on high inflation categories (groceries, gas, housing) reflects 28% of after-tax income compared to 48% for lower income brackets, suggesting the biggest spenders have plenty of cushion in their wallets. 2) Persistent inflation is a benefit to V/MA given ~2/3 of revenue is tied to volumes.

One potential headwind is roughly a decade after the original Durbin amendment within Dodd Frank put in place regulations around consumer debit cards limiting debit interchange and requiring a non-V/MA network to be enabled on most debit cards, regulators and politicians have proposed extensions to these regulations over the past 18 months that would incrementally expand the scope of the original Durbin amendment. BNPL volume happens through a combination of card-based and ACH-based payments. Thus, BNPL does not necessarily result in card disintermediation, and in some cases, can actually lead to higher numbers of card transactions. BNPL will gain relatively strong traction through e-commerce channels, with rather modest penetration in store with volumes to reach $2.5T by 2040.

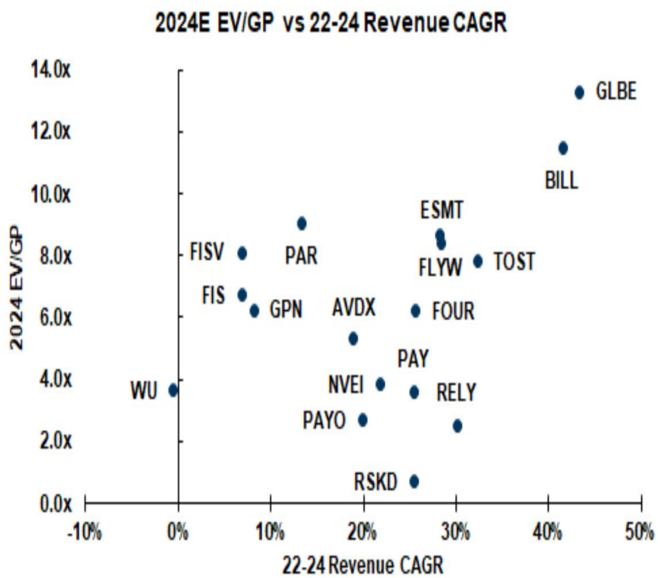
Indicators, Metrics & Stock Selection Framework

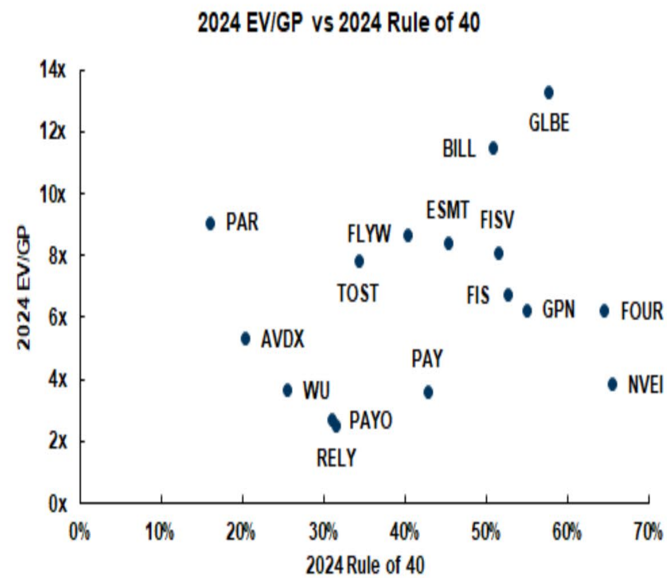
EV/EBITDA, EV/Gross Profit, EV/Sales, EBITDA Growth, Revenue Growth, Operating Margins, ROIC

The credit card / services group is one where we look at industry-specific metrics like NCO (net charge-off) and DQ (delinquency) rates.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC
Credit Cards & Payments							#VALUE!	
V	Visa Inc	443.3B	19.94X	24%	13.21%	68.55%	3.71%	30.4%
MA	Mastercard Inc	335.4B	25.65X	29%	18.75%	60.88%	2.74%	57.62%
AXP	American Express Company	117.9B		161%	10.42%	26.08%	#VALUE!	18.14%
PYPL	PayPal Holdings Inc	83.9B	12.43X	18%	14.63%	25.46%	6.81%	21.93%
SQ	Block Inc	39.6B	42.46X	110%	44.57%	7.25%	2.43%	39.73%
COF	Capital One Financial Corp.	42.1B		404%	3.12%	52.44%	#VALUE!	10.95%
DFS	Discover Financial Services	28.8B		385%	(1.76%)	64.27%	#VALUE!	15.16%
NU	Nu Holdings Ltd	18.1B	-245.21X	-105%	124.25%	7.02%	#VALUE!	0.25%
AFRM	Affirm Holdings Inc	3.3B	-82.27X	64%	(16.95%)	-89.45%	#VALUE!	(16.993%)
MQ	Marqeta Inc	3.6B	-43.28X		(16.663%)	-7.11%	#VALUE!	(9.232%)
PAYO	Payoneer Global Inc	1.9B	33.93X			8.01%	#VALUE!	





Management Commentary

Visa (V) on growth drivers…. "Now I'll provide an update on the drivers that propel this growth in consumer payments, new flows and value-added services. Our consumer payment strategy has 3 components to it: growing credentials, increasing acceptance and deepening engagement. Total consumer payments revenue for the fourth quarter and the year were both up more than 20% in constant dollars. Now moving on to new flows, which grew fourth quarter and full year revenue over 20% in constant dollars. Our B2B business had nearly $1.5 trillion in payments volume for the full year, growing 30% in constant dollars. In the fourth quarter, B2B payments volume was almost $400 billion, growing 21% year-over-year in constant dollars. Within B2B, our strategy is focused on card-based payments, cross-border payments and accounts receivable and accounts payable payments. And we've made progress across all 3 this quarter. Now moving to value-added services, which had $6 billion in revenue for 2022, up 20% in constant dollars. Our strategy here is also threefold: one, to deepen client penetration of existing products; two, to build new products and launch new solutions; and three, to extend geographically."

Block (SQ) on Cash App and Direct Deposit…. "Cash App Card and Direct Deposit are 2 of our most important banking products, and we're focused on growing usage of both. Cash App Card is usually our first financial services product that customers try and often their introduction to banking with Cash App. As we continue to deepen the connections between our ecosystems and undertake the complex integration of Afterpay, one of the long-term opportunities we are most excited for is in commerce. We're still early in our journey to transform Cash App into a commerce destination that bridges our seller and consumer ecosystems. We believe it will take some time to achieve this vision, and doing so will bring us back to our original mission to help sellers make more sales."

OptionsHawk Executive Summary & Focus Stocks

MasterCard (MA) is the top credit card stock with its unmatched ROIC and EPS growth outlook as its exposure to credit spending and new initiatives make it a consistent compounder. **Block (SQ)** valuation remains difficult to accept and likely has more downside in 2023 with a tougher competitive environment and weaker small business backdrop. **American Express (AXP)** is the value name at 10X EBITDA and 15X Earnings while having a higher-end customer base more insulated from inflationary pressures.

Financial Services – Payment Processors, MTO's & Transactional

Components: FLT, GDOT, PAYS, WEX, FIS, FISV, JKHY, EEFT, EVTC, EVOP, GPN, BCO, CATM, DBD, NCR, WU, IMXI, IIIV, RPAY, STNE, ACIW, FOUR, EPAY, VRRM, PSFE, FLYW, PAY, DLO, NVEI, MGI

International & Private Peers: Xoom, RIA, UAE Exchange, TransferWise, Remity, Skrill, Neteller, Tiplati, Paysera

Intro

Processor valuations have come under pressure in recent years as volume growth has tended to trail the networks and additional capital investment in the acquiring space has created an overhang. FIS and FISV have fairly large exposure to more stable businesses like banking/capital markets at FIS and fintech/payments at FISV. Total deal flow in the fintech space stood at $362B in 2021, while VC funding was at $123B, up 164% YoY and 78% vs. 2019, and the same as the combined total from 2015-18. Of note, over half of the new competitive fintech capital went to players in the acquiring/processing space where FISV, FIS, and GPN compete. The incumbents have focused on profitability and returning capital to shareholders, and if long-term interest rates keep rising and capital becomes more expensive, investors may view the processors more favorably vs. less profitable upstarts. M&A and R&D moves will be needed to defend their turf.

The stocks continue to trade near trough multiples, likely due to volume growth not consistently outpacing the networks along with macro headwinds like a stronger dollar, rising rates, and recession risk weighing on EPS. The inflation tailwind is less of a benefit at the merchant acquirers due to a larger share of revenue based on transactions rather than volumes.

Industry Backdrop & Investment Considerations

Payment Processing is a large business with fees in North America of around $85B from $3 trillion in credit card spending annually which is growing at 8% annually. Merchant Processing is also a big business with more than 31M businesses in North America. The next generation of SMBs will demand powerful, affordable software to run their businesses which is a massive opportunity for integrated Fintech companies to displace legacy providers.

B2B is the major untapped market opportunity for the payments industry. It is estimated that B2B payments volume totals approximately $120 trillion per year globally and roughly $25 trillion per year domestically. Compared to Business-to-Consumer (B2C), electronic B2B payments has significantly lagged in adoption across industries, with approximately one-third of total B2B global expenditures processed electronically, versus two-thirds of B2C global expenditures. There is an imminent shift within the B2B ecosystem as constituents realize the value proposition of digital adoption is beneficial to all participants. For businesses, digitization of accounts payable and accounts receivable functions enables significant workflow automation, reduces labor costs and human error associated with manually processing payments, and increases productivity.

Within this group we also have remittance (MTOs) (WU, EEFT, MGI, IMXI) and fleet/B2B (WEX, FLT, EPAY, VRRM).

According to the World Bank, the total remittance market is comprised of $750B in total flows, 80% of which are within emerging economies. The Global Remittance market accounted for $50B in fees in 2020 and is anticipated to register a CAGR of 7.6%. Developments in the digital space are changing the dynamics of the remittance market, driving it on a steady upward curve. Global remittances are around $750B and growing steadily while the digital remittance space is seen growing at a 10-12% CAGR through 2024. Because of globalization, remittances have increased sharply worldwide.

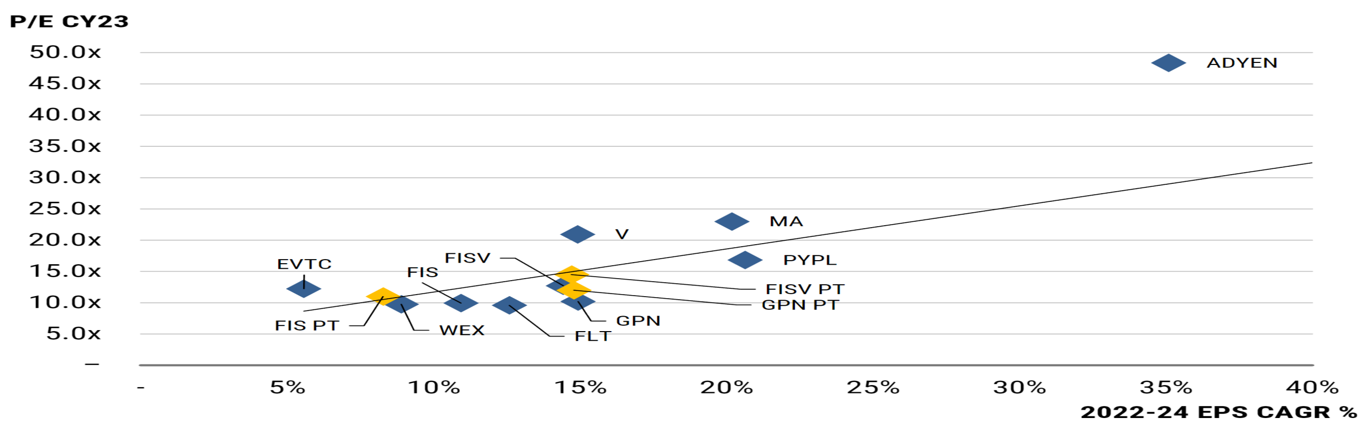
Key trends include the growth of ecommerce, prevalence of mobile devices, open banking and digital currency.

Indicators, Metrics & Stock Selection Framework

EV/Gross Profits, EV/EBITDA, EBITDA Growth, Revenue Growth, Margins, ROIC

Valuation & Comps

EV/EBITDA to EBITDA CAGR



Management Commentary

Fiserv (FISV) on the US consumer…. “Well, we've seen an environment that, over the past 2 years, we never saw before. And that has a lot of dimensions to it. It is money being brought into the system. It had tremendous suppressed spending and then accelerated spending. And when you look at our company, a large player in grocery, large player in petroleum, large player in QSR, so we have a very good look at a lot of the very strong stables. And the consumer is healthy. The consumer is healthy. I don't see it necessarily taking off, but if there's any pullback, it's very, very, very, small, if there is any. So I think the consumer is still out in force. Their behaviors -- I think the pandemic changed a lot of things, probably every person here has changed to something more. So I'm not sure that the dynamics are exactly the same as pre pandemic to post pandemic, and I see a strong consumer right now.”

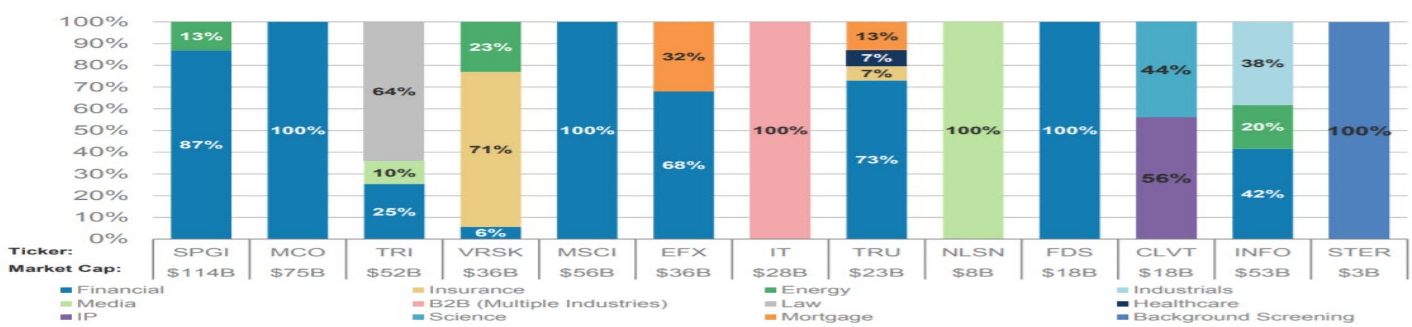
Fidelity Info (FIS) on B2B opportunity…. “So we feel like new geographies, new vertical markets, new B2B initiatives are very similar to what we outlined in September '21 at our last investor conference. mean we expect MineralTree in payables to grow 20-plus percent this year, the year that we're in. I think we announced in the last couple of quarters that our virtual card business, which is a part of MineralTree is growing like 60% year-on-year. And one of the things I think that's interesting with us is the existing financial institution base for distribution that we have through the TSYS partnership is a very active partner for mining of the virtual card product within MineralTree. So I think at the end of the day, you're talking about a market that's something like -- depending on who you listen to, like Mastercard, $125 trillion in annual spend, yet it's 90% kind of check and ACH. So we're really in the early innings of that business. I think we and probably everybody you mentioned is seeing that in the growth statistics that we're all publishing."

OptionsHawk Executive Summary & Focus Stocks

Among the three large cap processors, **Fidelity Info (FIS)** is the value name and rumors swirling about potential activism but **Global Payments (GPN)** at similar valuation has higher margins, stronger FCF and better growth and recently did a deal for EVO Payments to help defend share, the preferred name and into the value name bucket. **FleetCor (FLT)** is a top name for this group with consistent growth, high margins and leading FCF while an M&A catalyst could drive upside in 2023 as it looks to do an acquisition. **Nuvei (NVEI)** is a small cap that screens very attractive at 10X EBITDA with rapid growth and strong FCF. **StoneCo (STNE)** is a Brazilian name I recently profiled and is very attractive at these levels. Consolidation has been a consistent theme in this group and the names that stand out as a potential acquisition target are **Repay (RPAY)** and **International Money Express (IMXI)**. **Flywire (FLYW)** is a riskier name that is growing rapidly but lacks the profitability this environment wants.

Financial Services – FinTech

Components: BR, EFX, FDS, INFO, MCO, MSCI, SPGI, MORN, VRSK, RELX, TRI, TRU, CDLX, DFIN, FICO, IT, SNEX, VALU, DNB, ENV, PAGS, AON, RELY, CLVT



International & Private Peers: Experian

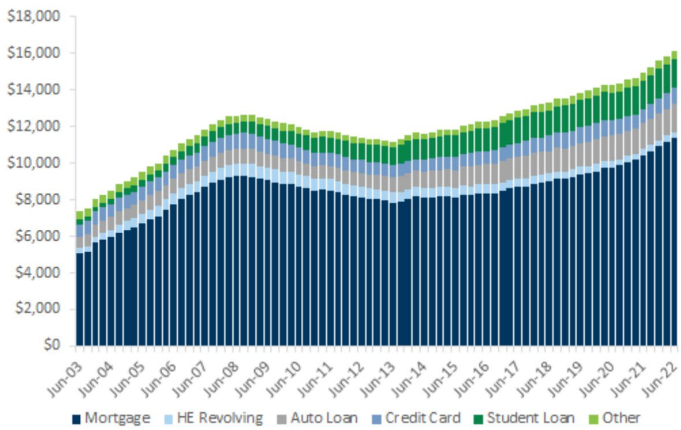
Intro

There are a bunch of smaller sub-groups within this broader category. Credit Bureau plays include TRU, FICO, EFX and Experian. The Index and Analytic plays are SPGI, MSCI, RELX, DNB and MCO. The Data-centric plays are VRSK, AON, BR, FDS, IT, TRI and MORN.

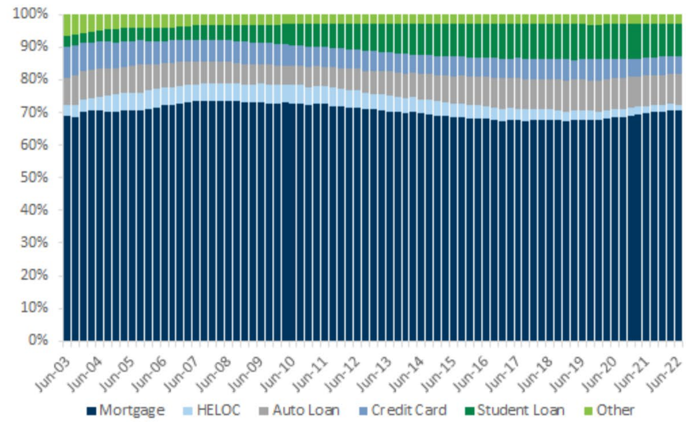
Mortgage originations remain weak, falling over 50% y/y, while auto loan originations are also coming under increasing pressure due to ongoing supply chain issues. Delinquency rates, which serve as the most reliable indicator for the health of the consumer, are well below historical averages. While delinquencies remain historically low, they are marginally ticking up, particularly in sub-prime, and that will be a key metric to watch going forward in respect to consumer credit.

Global debt issuance volumes contracted 36% y/y YTD. October issuance continued to deteriorate as Sept and Oct marked the two weakest months of the year so far. MCO's CEO said on the earnings call that he expects 3Q22 and 4Q22 will be the trough for issuance declines, which should start to improve throughout '23, particularly in 2H. Lower transactional revenue, hiring volume, and macro conditions weighed on results across the service providers last quarter.

Total household debt ($ in billions), quarterly



Loan type as a percentage of household debt, quarterly



Industry Backdrop & Investment Considerations

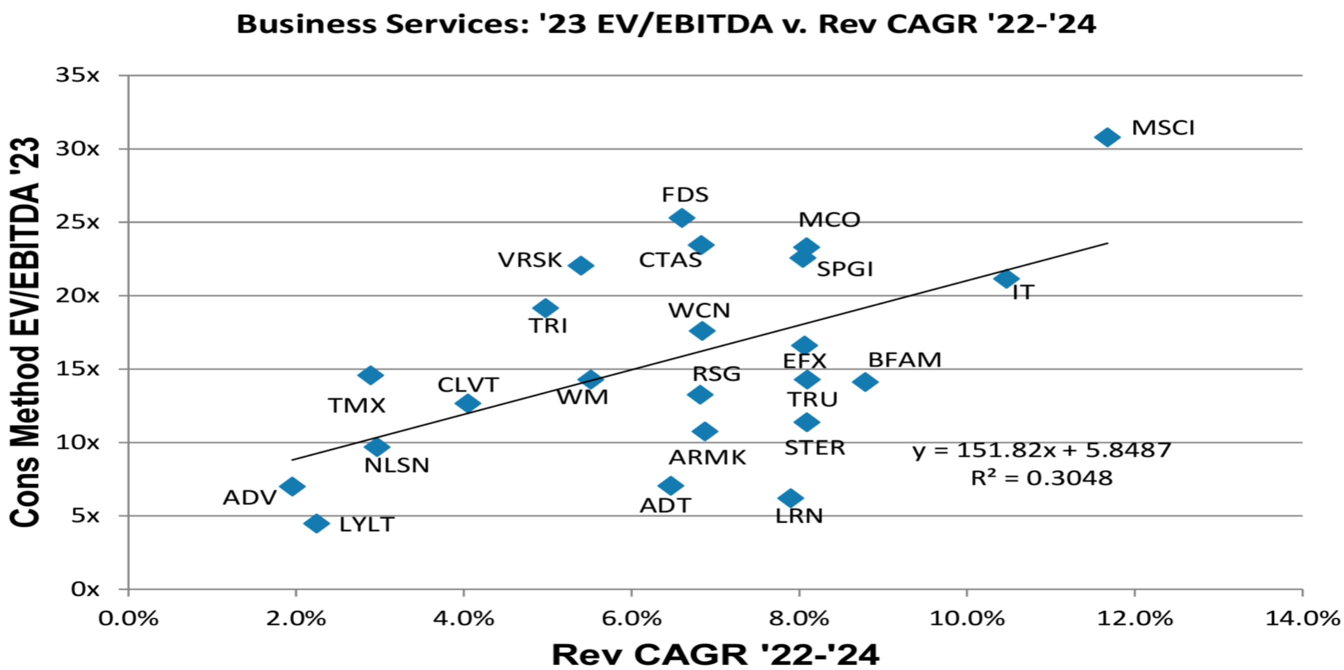
Revenues from Fintech are expected to increase from $150B in 2018 to $500 billion by 2030 at an average annual growth rate that's about 3x faster than the larger financial industry's projected revenue growth according to UBS. Key Fintech growth areas include digital payments, online lending, insurance technology (Insurtech), Wealthtech, and capital markets technology. AI and Machine Learning will be key to improving traditional business processes. Fintech has seen a great deal of investment activity from venture capitalists.

S&P Global is the largest component in this group with a $77.5B market cap and participates in data & analytics, research & commentary, benchmarks, credit ratings and ESG solutions. It notes key secular growth trends include rising total corporate debt, investors searching for unique data, ESG momentum, China capital markets reform, assets shifting to passive, and trade flow changes. MSCI estimates the Analytics TAM at $20B which aligns with other estimates seeing a 10-12% CAGR through 2027. IHS Markit estimates Information Services as a $250B market growing at a 5.1% CAGR. The Risk & Business Analytics market is estimated at $23B and seen growing to $45.9B by 2024, a CAGR of 14.8%. The Financial Software market is estimates at $21B while Professional Content estimated at $13B. Broadridge is a leader in Governance, Capital Markets and Wealth Management services and sees long-term trends of mutualization, digitization and data & analytics as favorable It estimates TAMs of $9-$13B, $10-$15B, and $6-$12B respectively.

Much of the industry has strong visibility due to subscription-based models with high percentage of recurring revenues. There are also high barriers to entry due to trusted brands and high switching costs lead to strong customer retention.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA CAGR, Revenue Growth, EBITDA Margins, P/FCF



Valuation & Comps

Analytics						Organic Revenue Growth		EV / EBITDA Consensus Method		EV / EBITDA Unadjusted Post-SBC		Price / Earnings Consensus Method		Price / Earnings NI to Common Adj. for Amort, net	
Ticker	Company	Rating	Share Price	Equity Value	Enterprise Value	'23 (%)	'24 (%)	CY '23E (x)	CY '24E (x)	CY '23E (x)	CY '24E (x)	CY '23E (x)	CY '24E (x)	CY '23E (x)	CY '24E (x)
CLVT.N	Clarivate Plc	OW	10.52	7,710	12,795	3.1%	3.7%	12.0x	11.3x	13.4x	12.5x	13.4x	10.6x	16.1x	12.5x
FDS.N	Factset Research Systems Inc	UW	432.92	16,780	18,226	8.8%	6.5%	23.8x	22.0x	23.8x	22.0x	28.6x	25.9x	28.9x	26.1x
IT.N	Gartner Inc	EW	338.44	27,109	29,042	11.4%	11.0%	21.2x	19.0x	23.2x	20.8x	33.1x	28.8x	33.1x	28.8x
MSCI.N	Msci Inc	EW	503.02	40,681	44,351	11.3%	14.5%	30.5x	26.4x	30.5x	26.4x	38.9x	32.0x	38.9x	32.0x
TRI	Thomson Reuters Corp	EW	110.70	47,112	50,368	5.3%	4.9%	19.1x	18.1x	19.1x	18.1x	30.6x	28.0x	30.6x	28.0x
VRSK.O	Verisk Analytics Inc	EW	177.00	25,235	27,643	6.8%	6.9%	20.4x	18.3x	20.4x	18.3x	31.2x	26.1x	31.2x	26.1x
MCO.N	Moody's Corp	EW	298.74	54,938	60,669	5.8%	8.3%	25.1x	22.0x	25.1x	22.0x	34.4x	27.4x	34.4x	27.4x
SPGI.N	S&P Global Inc	OW	354.66	117,357	128,749	5.1%	8.1%	22.7x	20.1x	22.7x	20.1x	28.5x	25.1x	28.5x	25.1x
Average - Analytics						**7.2%**	**8.0%**	**21.8x**	**19.6x**	**22.3x**	**20.0x**	**29.8x**	**25.5x**	**30.2x**	**25.8x**
EXPN.L	Experian Plc	OW	33.81	31,176	35,023	6.0%	7.3%	14.4x	13.3x	14.5x	13.4x	23.6x	21.4x	23.6x	21.1x
EFX.N	Equifax Inc	EW	207.10	25,535	31,013	7.7%	8.7%	16.9x	15.2x	16.9x	15.2x	26.2x	21.5x	26.2x	21.5x
TRU.N	Transunion	EW	65.32	12,620	18,118	6.1%	8.7%	12.6x	11.3x	13.3x	11.9x	17.4x	14.6x	19.3x	16.1x
FICO.N	Fair Isaac Corp	NC	616.49	15,507	17,228	8.2%	9.8%	22.3x	20.0x	22.3x	20.0x	31.0x	26.8x	31.0x	26.8x
DNB.N	Dun & Bradstreet Holdings Inc	NC	14.60	6,362	9,807	2.7%	4.9%	10.7x	10.2x	10.8x	10.3x	12.8x	11.8x	12.8x	11.8x
ADP.O	Automatic Data Processing Inc	EW	253.32	105,153	106,910	7.8%	7.0%	20.8x	19.1x	20.8x	19.1x	29.6x	26.5x	29.6x	26.5x
PAYX.O	Paychex Inc	EW	121.67	43,850	43,428	6.8%	6.5%	18.9x	17.5x	18.9x	17.5x	27.9x	25.9x	27.9x	25.9x
FA.O	First Advantage Corp	NC	12.81	1,962	2,128	2.3%	6.9%	8.4x	7.6x	8.7x	NA	12.3x	10.9x	12.7x	11.2x
STER.O	Sterling Check Corp	EW	13.53	1,341	1,684	5.0%	8.5%	7.7x	7.0x	8.8x	7.9x	11.6x	9.9x	13.9x	11.7x
HRT.N	Hireright Holdings Corp	NC	9.52	757	1,303	(6.2%)	7.5%	7.7x	6.3x	8.6x	6.8x	7.5x	6.5x	8.6x	7.3x
Average - Credit & Processors						**4.6%**	**7.6%**	**14.1x**	**12.7x**	**14.4x**	**13.6x**	**20.0x**	**17.6x**	**20.6x**	**18.0x**
Average - Information Services						**5.8%**	**7.8%**	**17.5x**	**15.8x**	**17.9x**	**16.6x**	**29.6x**	**25.3x**	**29.8x**	**25.4x**

Analytics Comps - Additional Metrics			Revenue Growth				Adj. EPS Growth			Adj. EBITDA Margin	EV / Sales		Unlevered EV/FCF		Levered P/FCF		Net Levg	PEG	
			CY '21E	CY '22E	CY '23E	CY '24E	CY '22E	CY '23E	CY '24E	CY'23	CY '23E	CY '24E	CY '23E	CY '24E	CY '23E	CY '24E	LTM	CY '23E	CY '24E
Ticker	Company	Rating	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)
CLVT.N	Clarivate Plc	OW	49.7%	40.4%	(2.0%)	3.7%	14.6%	(1.3%)	25.6%	41.4%	5.0x	4.8x	10.7x	10.1x	11.3x	12.0x	4.4x	NA	0.4x
FDS.N	Factset Research Systems Inc	UW	9.8%	14.9%	10.9%	6.5%	15.7%	9.6%	10.5%	35.9%	8.5x	8.0x	23.8x	22.2x	27.3x	25.1x	1.9x	3.0x	2.5x
IT.N	Gartner Inc	EW	15.5%	15.0%	9.7%	11.0%	9.9%	0.5%	14.8%	23.0%	4.9x	4.4x	27.4x	24.9x	24.9x	22.5x	1.4x	69.0x	1.9x
MSCI.N	Msci Inc	EW	20.5%	8.9%	9.9%	14.5%	13.8%	14.2%	21.6%	59.4%	18.1x	15.8x	36.7x	32.4x	36.1x	31.2x	2.8x	2.8x	1.5x
TRI	Thomson Reuters Corp	EW	6.4%	3.7%	2.6%	4.9%	26.7%	27.5%	9.5%	38.9%	7.4x	7.1x	26.6x	26.0x	26.1x	25.5x	1.4x	1.1x	2.9x
VRSK.O	Verisk Analytics Inc	EW	7.7%	(3.7%)	(10.3%)	6.7%	3.1%	3.6%	19.3%	52.2%	10.7x	10.0x	30.8x	27.6x	29.6x	26.2x	1.8x	8.6x	1.4x
MCO.N	Moody's Corp	EW	15.8%	(13.4%)	3.3%	8.3%	(32.4%)	4.3%	25.6%	43.5%	10.9x	10.1x	32.3x	28.9x	30.5x	26.8x	2.5x	8.0x	1.1x
SPGI.N	S&P Global Inc	OW	11.5%	33.6%	12.0%	8.3%	(16.4%)	12.4%	13.4%	45.8%	10.4x	9.6x	27.3x	24.4x	25.4x	22.6x	1.6x	2.3x	1.9x
Average - Analytics			**17.1%**	**12.4%**	**4.5%**	**8.0%**	**4.4%**	**8.8%**	**17.5%**	**42.5%**	**9.5x**	**8.7x**	**27.0x**	**24.6x**	**26.4x**	**24.0x**	**2.2x**	**13.5x**	**1.7x**
EXPN.L	Experian Plc	OW	13.8%	8.5%	6.0%	7.3%	11.3%	8.7%	10.4%	34.8%	5.0x	4.7x	25.2x	23.0x	23.7x	21.5x	1.7x	2.7x	2.1x
EFX.N	Equifax Inc	EW	19.3%	3.7%	6.7%	8.7%	(1.9%)	5.5%	21.9%	33.7%	5.7x	5.2x	27.8x	24.9x	25.5x	22.2x	3.2x	4.8x	1.0x
TRU.N	Transunion	EW	14.2%	19.5%	5.0%	8.7%	(1.2%)	3.0%	18.8%	36.9%	4.7x	4.3x	20.8x	18.3x	21.0x	14.9x	4.1x	5.7x	0.8x
FICO.N	Fair Isaac Corp	NC	2.4%	5.5%	8.2%	9.8%	25.2%	12.5%	15.9%	50.8%	11.3x	10.3x	N/A	N/A	N/A	N/A	2.9x	2.5x	NA
DNB.N	Dun & Bradstreet Holdings Inc	NC	24.6%	2.8%	2.7%	4.9%	1.4%	2.0%	8.9%	40.0%	4.3x	4.1x	10.7x	10.0x	13.5x	12.4x	3.9x	6.4x	1.3x
ADP.O	Automatic Data Processing Inc	EW	6.4%	9.3%	7.8%	7.0%	16.1%	13.2%	11.5%	27.8%	5.8x	5.4x	23.0x	21.3x	23.2x	21.5x	0.4x	2.2x	2.3x
PAYX.O	Paychex Inc	EW	8.2%	10.0%	6.8%	6.5%	15.7%	8.6%	7.7%	44.6%	8.4x	7.9x	26.9x	25.9x	27.0x	25.9x	-0.2x	3.3x	3.4x
FA.O	First Advantage Corp	NC	39.9%	14.6%	2.3%	6.9%	1.3%	1.9%	12.7%	30.2%	2.5x	2.4x	15.2x	12.6x	N/A	N/A	0.9x	6.4x	0.9x
STER.O	Sterling Check Corp	EW	41.4%	20.9%	4.1%	8.5%	10.8%	3.2%	17.2%	27.0%	2.1x	1.9x	10.4x	9.4x	10.6x	9.3x	1.9x	3.6x	0.6x
HRT.N	Hireright Holdings Corp	NC	35.1%	9.8%	(6.2%)	7.5%	96.8%	(48.2%)	15.7%	22.4%	NA	NA	7.2x	4.6x	7.5x	5.1x	3.3x	NA	0.4x
Average - Credit & Processors			**20.5%**	**10.5%**	**4.3%**	**7.6%**	**17.6%**	**1.0%**	**14.1%**	**34.8%**	**5.5x**	**5.1x**	**18.6x**	**16.6x**	**19.0x**	**16.6x**	**2.2x**	**4.2x**	**1.4x**
Average - Information Services			**19.0%**	**11.3%**	**4.4%**	**7.8%**	**11.7%**	**4.5%**	**15.6%**	**38.2%**	**7.4x**	**6.8x**	**22.5x**	**20.4x**	**22.7x**	**20.3x**	**2.2x**	**8.3x**	**1.5x**

Management Commentary

S&P Global (SPGI) on secular trends, issuance and trends…. "We continue to see significant growth in multiple business lines due to secular trends that will likely benefit us for years to come, like energy transition as well as the near-term benefit we see from volatility and the need for insights and analytics in times of turbulence. We understand the importance of reliable market benchmarks to the secular energy transition story, and we're positioning ourselves for long-term success. Our Ratings Research team is expecting an approximately 19% decline in global market issuance, including both rated and unrated issuance for the full year. This compares to the previous forecast of down 16%. Importantly, our financial results and guidance are more closely tied to billed issuance, which can differ materially from market issuance as we described last quarter. When we look to the broader macroeconomic environment for the rest of 2022, we continue to see further deterioration from what we expected in August. In addition to the downward trend in issuance, our expectations for GDP growth, inflation and the commodities markets have all lowered. We believe that the private credit funds will be looking over time to have some sort of risk, transformation, whether it's related to fixed floating or it has to do with securitization or syndication. We think at that time, they're going to be wanting some Estimate services, potentially Ratings services. In addition, we've identified private credit as one of our most important strategic growth drivers. We already have a base of private credit businesses that were part of IHS Markit. And related to that, we have a strong starting point with products like iLEVEL that provides information to portfolio managers. So we've identified private credit as a growth area for us for Ratings as well as for Market Intelligence going forward. And we're watching the trend very carefully."

Moody's (MCO) on issuance and pent-up demand…. "We've got some tough issuance comps in the first quarter. There's a lot of pent-up supply. You've got a lot of private equity dry powder. M&A has been suppressed this year. So I think as the market gets certainty and works through this in the first, call it, quarter, first half of the year, I think we're going to see issuance levels resume and start to normalize in the second half of the year. Yes. I mean there's just a high level of correlation between spec-grade default rates and spreads.

So as long as we think that those spec-grade default rates are going to remain within historical norms, we think that spreads should remain relatively within those averages as well. So just in general, across our entire portfolio, corporate is the biggest. And I think that's where you're going to have the most recovery because that's where we had the most acute downturn, right? And it's leveraged finance. And so what's going to drive that, Andrew, we've got very good maturity walls. If you look at the spec-grade maturity walls, even for the next 2 years, they're higher than they've been. We've got more maturities in the next 2 years in the 4-year spec-grade maturity walls than we've had at any other time. So a lot of debt that's got to be out there that's got to get refinanced. There's a lot of private equity dry powder that has still got to get deployed. M&A levels have been suppressed. And so I think that's going to be a key driver as well."

OptionsHawk Executive Summary & Focus Stocks

This group contains some of the most interesting growth names and long-term winners though a lot are trading at premium multiples still. Both SPGI and MCO have some headwinds and EPS estimates have seen sharp revisions lower since April while **FICO/IT** have seen sharp revisions higher. **FactSet (FDS)** screens attractive as a durable growth name with a high ROIC and increasing estimates. **AON PLC (AON)** is another quality FCF name I would highlight among these large caps for this environment. **MSCI** was a long-time favored name but at 32.85X EBITDA and with scrutiny coming to ESG it is a name at risk of multiple compression. None of the small cap screen too attractive in this group, **Stonex (SNEX)** was a great find last year that benefits from volatile markets but the move looks overdone at this point.

Financial Services – Real Estate & Tax Services

Resources: Inside Mortgage Finance,

Components: HRB, Z, FRG, RDFN, RLGY, RMAX, CSGP, CBRE, JLL, CWK, NMRK, MMI, CIGI, FSV, RKT, PFSI, WD, COOP, HTH, BEKE, EXPI, GHLD, CLCT, HHC, OPEN, LDI, COMP, DOMA, BLND, OPAD, HMPT, FTHM, ZG, UWMC, WE, BCOR, VEL, OPAD

Mortgage Originators: GHLD, LDI, RKT, COOP, PFSI, UWMC, MMI, WD, HTH, HMPT

Internet/Cloud Real Estate Services: Z, RDFN, OPEN, COMP, RMAX, RLGY, BEKE, EXPI

Property Management: CSGP, CBRE, JLL, CWK, CIGI, FSV, NMRK, HHC; Tax Services: HRB, FRG

International & Private Peers

Intro

In mortgage originations it is no secret the group is under pressure from surging rates and a lack of new and refinance applications which is likely to remain the case for a while. COOP and PFSI have fared better than the originator focused firms with strong performance of their servicing arms as well as significant cost takeouts. Servicers/originators are outperforming other consumer lenders who face loan losses as defaults potentially accelerate on their loan books driven by a consumer with depleted savings who faces negative real wage growth and high inflation. The current outlook for mortgage industry volumes is poor with a 48% decline in mortgage loan origination in 2022 followed by 11% decline in 2023 expected. RKT is balancing strategic investments and cost discipline as it progresses towards its long-term platform goals.

Similarly, real estate technology stocks are facing similar industry-wide headwinds from weakening housing activity. The steep increase in mortgage rates and the accompanying decrease in affordability – the fastest 6 month and 12-month deterioration on record – has widened the range of potential outcomes for the housing market in 2H'22 and 2023. Although online real estate platforms will continue to benefit from the ongoing shift online for real estate inventory discovery and diligence, they will likely face traffic growth headwinds from declining home sales and low inventory. Exposure to the cyclicality of the broader real estate market has driven more volatility among these stocks relative to the broader market. Real estate brokerages and other businesses that rely on transactions will be more reliant on market share gains for growth, as opposed to overall growth in the industry.

For real estate servicers, expect CRE transaction activity to be more resilient in a mild downturn driven by industrial/multifamily activity. CWK focuses on commercial real estate with 44% of their fee revenue generated from Property, facilities and project management which are relatively non-cyclical services. Portfolio allocation to real estate among institutional investors has more than doubled since 2000. With higher inflation and slower growth increasing the risk of stagflation, the appeal of real assets such as real estate increases and this dynamic boding well for CRE services firms that are tethered to Real Estate. The CRE services firms have been active in consolidating the industry as well as acquiring businesses to in-fill open space within their portfolios across businesses, services, or geographies. Despite significant industry consolidation over the years, the five top players account for only ~20% of global market share, up from ~5% in 2012. CRE services firms have been focused on growing the more stable, recurring parts of their businesses to diversify revenues, reduce earnings volatility and create cross-selling opportunities. The more recurring parts of businesses generally include property and facility management, loan servicing, and investment management as the CRE firms enter into multi-year contracts to provide these services. JLL management recently highlighted the CRE technology market is large and is forecast to grow at an 8% CAGR from $17B in 2022 to $24B in 2027. This large market drives investment in proptech. Proptech funding grew at ~32% CAGR from $1B in 2011 to $18B in 2021. Management noted that the WD (Work Dynamics) market is large and highly fragmented. Current global market size is ~$200B and top 5 firms account for 5% of total market share.

Industry Backdrop & Investment Considerations

Colliers estimates the real estate services market at $240B and notes it is highly fragmented with the top five firms accounting for less than 20% of market share and seeing massive consolidation potential.

For the US residential housing market, the annual brokerage market accounts for $1.5 trillion with 5.3M existing homes sold annually. Real estate sales and brokerage revenues have grown at a 4.3% CAGR since 2008. The mortgage industry has a $1.3 trillion annual purchase origination loan volume and Title/Closing a $17B annual revenue industry. The tax industry is a $21B annual industry. Large and growing markets include the $44B mortgage originations market, $35B escrow market, $45B property management services market, $99B home insurance market, $2.5B home warranty market, $355B home renovation market and $18B moving services market. There is a major digital shift occurring across real estate industries with consumers wanting simplification, transparency, insights and better pricing across the value chain and the digital transformation is in the early innings compared to other industries.

The current mortgage servicing industry is a byproduct of the post-Global Financial Crisis regulatory environment that created independent mortgage originators and servicing firms outside of the traditional banks. These new companies with recent high yield issuance have yet to go through an economic recession. Mortgage banking is one of the first sectors to react to any changes in economic regime given its direct tie to the 10yr treasury yield, which governs volume and margins in the industry. The health of the industry is tied to origination volumes, gain on sale margins and the sizes of servicing portfolios — which are driven by the 10yr treasury yield, bond market volatility and the primary-secondary mortgage spread. With the forward 10yr treasury curve elevated and flat through 2023, the market is anticipating a challenging next few years.

Real estate transactions and leasing activity are highly cyclical and correlated with economic activity. Sector earnings have tracked transactions and leasing activity. The CRE Broker industry provides a wide array of real estate services to landlords and occupiers. Greater scale and product offerings provide cross-selling opportunities and can help to accelerate revenue and earnings growth. Brokers have historically outperformed the S&P500 during periods of credit spread compression. Credit spreads tend to compress during periods of economic expansion as corporate credit spreads decline and 10-year spreads rise. Broker share prices are cyclical in nature as their earnings are highly levered to the commercial real estate business cycle.

Strong household formation growth and easing home affordability due to low mortgage rates are positive tailwinds for the mortgage origination industry.

The process of buying a new house can be intimidating with separate service providers for real estate agents, inspections, lending, appraisals, titles, escrow, insurance and movers. There are opportunities across each of these phases of the real estate transaction for digital disruption and consumer demand digital experiences to simplify the process and save on costs. Lenders and Servicers have become increasingly focused on automation and workflow management to operate more efficiently and meet their regulatory requirements as well as using technology to enhance the consumer experience during the mortgage loan origination and closing process. U.S. mortgage loan market participants work to minimize the risk in lending, servicing and capital markets, they rely on the integration of data and analytics with solutions that enhance the decision-making process. Cloud-based real estate brokerage is a cloud-based technology with paperless platform. This allows agents and brokers to run and operate their business entirely online. Real Estate data & analytics in both residential and commercial is accelerating the decision-making process and providing for more informed decisions. Cloud property management software is becoming increasingly popular as it offers several benefits including scalability, greater accessibility, better security, and cost savings. ANGI estimates the home services market at $500B with less than 20% of projects fulfilled online.

Increasing asset allocations to real estate combined with a significant amount of capital raised for real estate investments, rebounding economic growth and low interest rates should bode well for future transaction volumes. Expect the CRE brokerage industry to continue to grow its percentage of revenue in more stable, predictable and recurring businesses, such as property and facility management, investment management, and asset servicing. As institutional ownership increases and as occupiers look to reduce costs, there will be an increased focus to outsourcing of property and facility management to the CRE Brokers.

Indicators, Metrics & Stock Selection Framework

P/E, EPS Growth, Operating Margins, EV/EBITDA

CRE Services Firms share price performance has historically been well correlated with earnings growth (five-year basis, R-squared of 0.89).

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change
Real Estate & Tax							#VALUE!		#VALUE!
CSGP	CoStar Group Inc	32.8B	43.67X	6%	21.4%	24.67%	1.55%	16.34%	25.00%
CBRE	CBRE Group Inc	24.2B	9.36X	63%	12.97%	8.05%	#VALUE!		-8.29%
BEKE	KE Holdings Inc - ADR	20.0B	25.30X	-51%	34.3%	13.31%	#VALUE!	6.18%	4.67%
RKT	Rocket Companies Inc	16.7B	85.66X	-45%	1598.8%	-11.93%	#VALUE!	191.81%	-107.83%
Z	Zillow Group Inc	8.3B	11.33X	-213%	51.36%	26.92%	53.42%	(2.469%)	-16.19%
ZG	Zillow Group Inc	8.3B	11.31X	-213%	51.36%	26.92%	53.42%	(2.469%)	-16.19%
JLL	Jones Lang LaSalle Inc	7.7B	8.09X	105%	5.91%	5.33%	#VALUE!	16.75%	-14.36%
UWMC	UWM Holdings Corp	7.4B	29.08X	-121%	87.33%	-0.31%	#VALUE!	8.75%	20.00%
HRB	H & R Block Inc	6.5B	8.26X	2%	4.58%	-93.25%	#VALUE!	50.88%	30.20%
FSV	FirstService Corp	5.5B		36%	4.03%	9.94%	#VALUE!	14.53%	-9.46%
CIGI	Colliers International Group Inc	3.9B	9.48X	65%	7.46%	13.09%	7.83%	27.82%	0.00%
HHC	Howard Hughes Corp	3.8B	15.97X	-314%	1609.77%	30.48%	#VALUE!	0.78%	89.25%
COOP	Mr Cooper Group Inc	3.0B	2.83X	-13%	25.75%	42.55%	#VALUE!	7.82%	-71.53%
PFSI	PennyMac Financial Services Inc	2.9B	5.62X	-39%	21.69%	36.01%	#VALUE!	17.34%	-42.15%
CWK	Cushman & Wakefield PLC	2.7B	6.12X	155%	13.02%	8.03%	#VALUE!	12.75%	-16.46%
WD	Walker & Dunlop, Inc.	2.7B	8.18X	8%	25.09%	23.76%	#VALUE!	5.31%	-32.68%
HTH	Hilltop Holdings Inc.	1.9B		-9%	11.49%	38.65%	#VALUE!	11.79%	-35.00%
EXPI	eXp World Holdings Inc	1.9B	24.65X	193%	48.72%	1.00%	12.42%	98.13%	-71.96%
NMRK	Newmark Group Inc	1.4B	5.75X	75%	15.57%	18.43%	#VALUE!	50.6%	-6.29%
WE	Wework Inc	1.4B	-8.92X	48%	(49.081%)	-12.85%	#VALUE!	(506.129%)	8.66%
MMI	Marcus & Millichap Inc	1.4B		233%		11.31%	#VALUE!	46.12%	-20.88%
COMP	Compass Inc	1.2B	-4.56X	137%	(81.451%)	-2.83%	-27.63%		43.92%
BCOR	Blucora Inc	1.1B	10.00X	61%	47.74%	4.46%	4.05%	11.8%	-10.84%
FRG	Franchise Group Inc	1.0B	7.41X	37%	(23.413%)	6.95%	#VALUE!	(8.937%)	-35.00%

Management Commentary

CoStar (CSGP) on new products and building out residential….“The next product enhancement on the CoStar roadmap involves adding information on 12,600 commercial property investment funds that invest almost $3.6 trillion in commercial properties around the world. These investment funds hold over 70,000 commercial properties. I believe this new investment fund capability unlocks significant potential revenue opportunity. The investment fund product is scheduled to release in CoStar in the first quarter of 2023. We believe that there is significantly more revenue opportunity ahead for CoStar so we're continuing to grow our CoStar sales force to better capture that opportunity. Clearly, the commercial property transaction market is in a period of disruption, with buyer and seller expectations not yet on the same page. Buyers are quick to recognize price drops, but sellers are slower to accept reality. The result is an overall drop in sales volume across the board. As expected, we are seeing a drop in the rate that properties brought to the platform actually end up selling, what we call the trade rate. I would not be surprised if the number of distressed property sales quadrupled over the next few years, creating significant revenue opportunity for Ten-X. We're focused on building complete coverage of residential listings throughout the United States, as well as developing unique proprietary content by leveraging the skills and capabilities of our awesome nationwide research organization.”

Jones Lang (JLL) on transaction volumes, urbanization, and outlook….“For transaction volumes, the level of interest rates is far less relevant than the predictability and the speed of change. What we have seen over the last couple of months was just way too fast for the market to adapt. But we will see over the coming months a new equilibrium between refinancing costs and property yields, and then transaction volumes will go up again. Again, this will be an important growth driver for JLL. Population migration into major urban areas continues to be a sustainable trend and is an important driver for our business. This ongoing migration is -- into metropolitan areas, centers, our clients, it creates for us a larger, more concentrated market, allowing us to drive margins. Big component for the margin appreciation, which we will see over the coming years. We believe that JLL is extremely well positioned and superbly equipped to drive long-term profitable growth way beyond 2025. For 2025, our targets of $10 billion to $11 billion of fee revenue and 16% to 19% of adjusted EBITDA margin must consider a subdued environment in 2023, and they are based on a nice recovery in 2024."

OptionsHawk Executive Summary & Focus Stocks

CoStar (CSGP) is the high-quality name in this group with strong growth, margins and rising estimates while carrying a premium valuation. CSGP has built out a very diversified business and fears of its exposure to a commercial real estate slowdown are overblown. **Zillow (Z)** at an $8B market cap trading 11X EBITDA is starting to look attractive with the weak housing market well-known, it remains a quality business and dominant player with several favorable growth trends. **Mr. Cooper (COOP)** is a mortgage originator that has held up incredibly well despite the elevated rates as the best-in-class operator. There are a lot of weak businesses in the small cap group, but **Colliers (CIGI)** is one of the healthier companies. **Howard Hughes (HHC)** is another small cap worth a look due to its hospitality exposure and has seen sharply revised higher estimates.

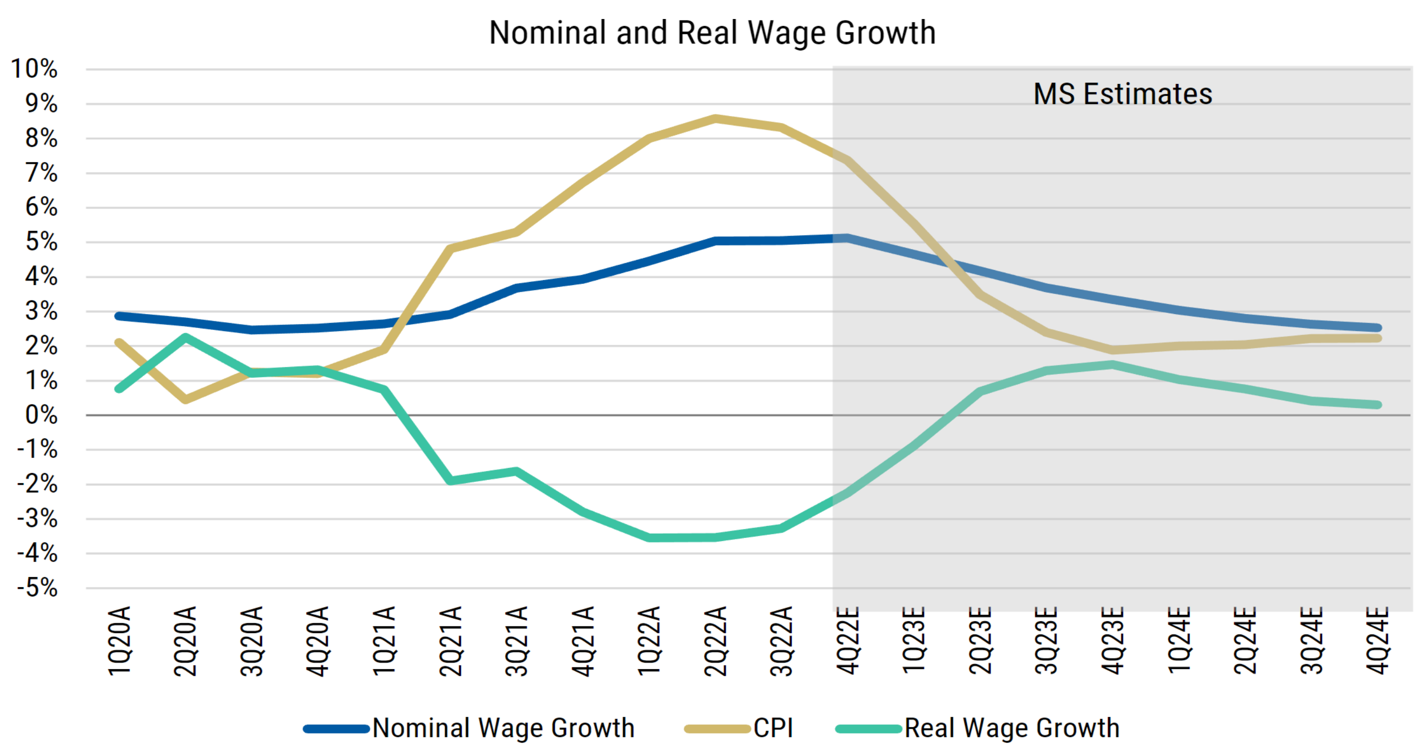
Financial Services – Consumer & Specialty Financial Services

Components: WRLD, SLM, NAVI, SC, ALLY, SYF, ENVA, CACC, NNT, PRAA, LPRO, TREE, SOFI, OMF, ATLC, QFIN, LC, LX

International & Private Peers

Intro

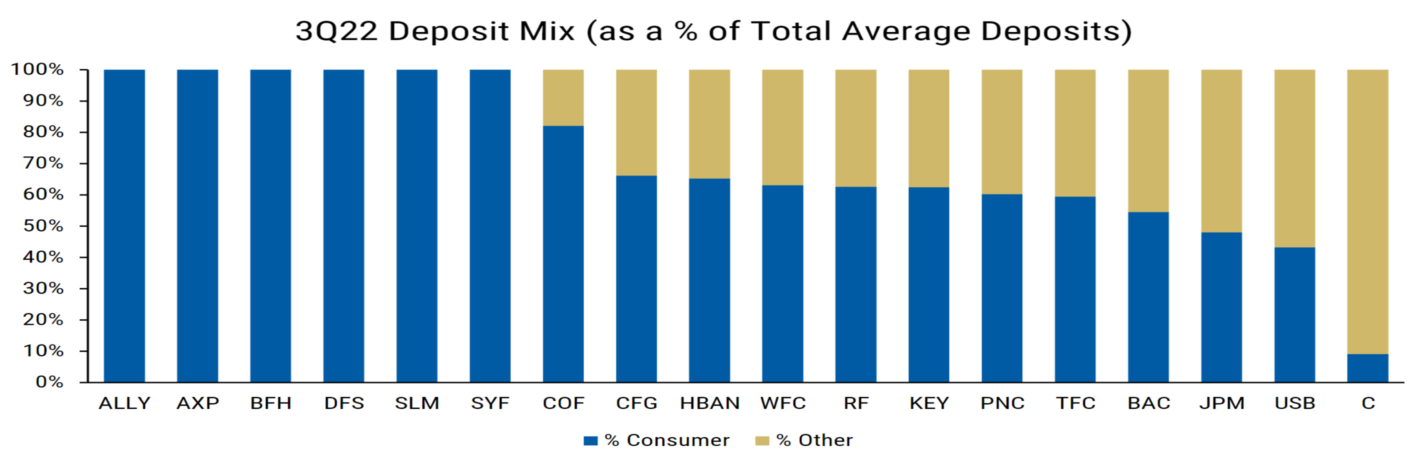
Every stock in this group is down in 2022 with many down more than 30% with rising concerns of consumer credit and the weight of weaker housing/auto markets on lending. Higher credit losses driven by a consumer cash flow squeeze from high inflation, rising unemployment, and less excess savings is the issue. With 22% of loans out to the bottom 40% of income earners consumer loan delinquencies and net charge-offs will accelerate over the next several quarters.



Industry Backdrop & Investment Considerations

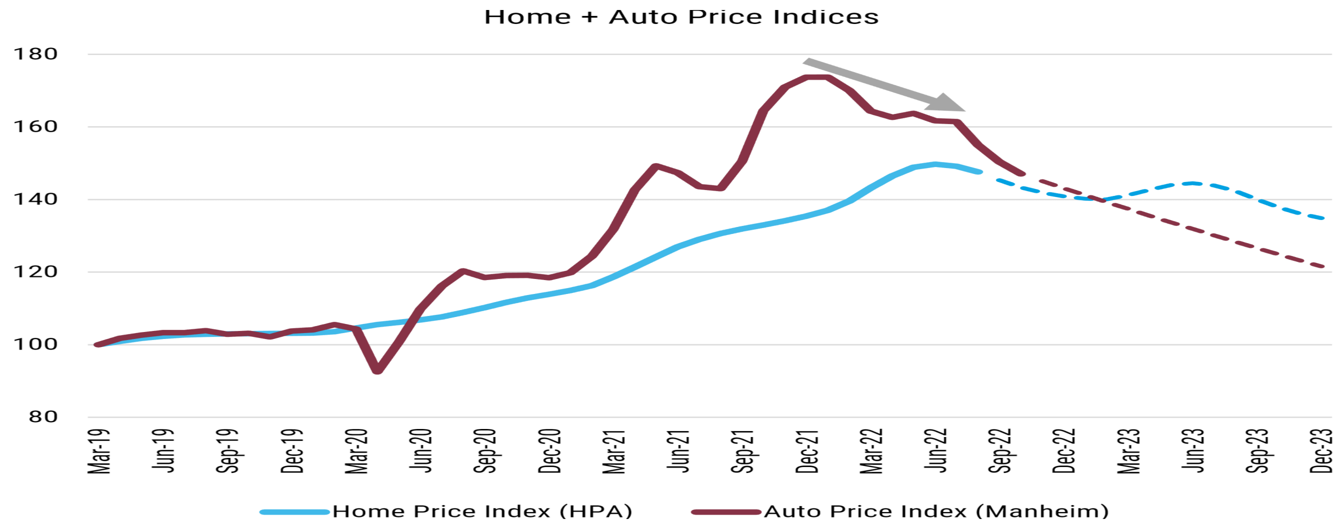
This group of consumer finance stocks clearly has a lot of correlation with the health of consumer credit which is showing some signs of weakening while a weaker Macro backdrop causes lower volumes for loans in Auto and Home. Consumer deposit skewed banks are in a better spot to retain deposit growth as this customer set typically has the least amount of excess deposits to shift to higher-yielding liquidity options. In October, credit card balance growth remains off the charts at 19% y/y consistent with growth in the prior two months and close to a 20 year high. Compounding this issue is a quickly accelerating pace of credit losses & delinquencies as well as the uncertain macroeconomic picture. The longer this pace of consumer debt growth persists and the longer we go before a material increase in jobs losses… the larger the risks to the consumer become. That's because consumers have some extra savings cushion today to withstand loss of income. At the current rate of spending, consumers will not have much in the way of extra savings starting in late 2023.

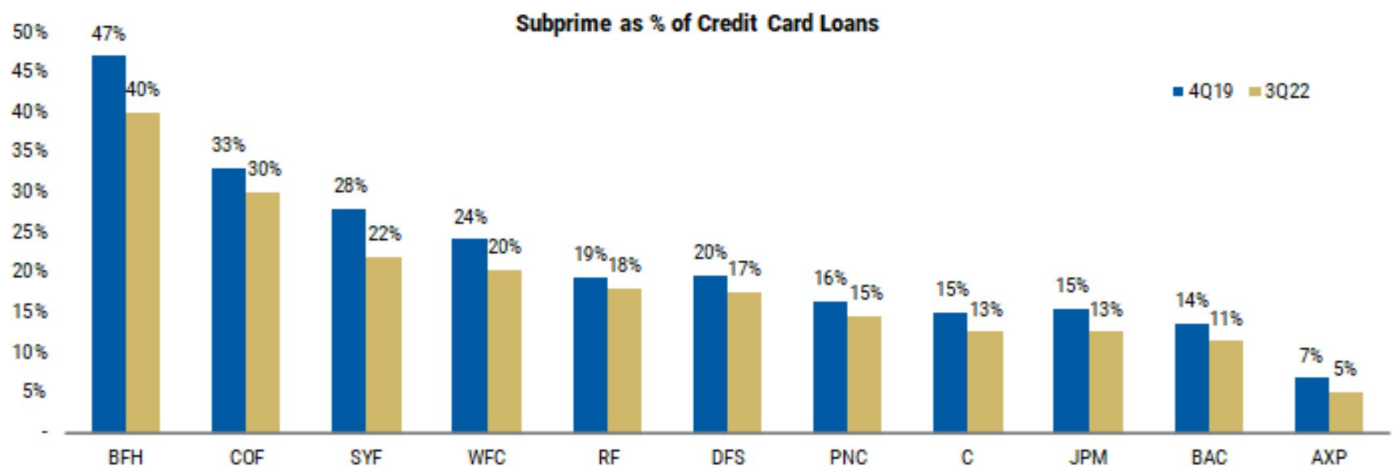
Private student lending has a number of key growth tailwinds. The pandemic is finally moving into the rear view mirror, driving what could be the first year of enrollment growth since 2019 as students return to a more normal campus experience. Elevated inflation elsewhere is likely to reaccelerate tuition growth. Recessions have also tended to be followed by stronger college enrollment activity, something to watch out for as the Fed works to fight inflation. SLM provides private loans to students in school as the cost of college is typically above federal borrowing limits. NAVI holds the largest portfolio of government-guaranteed loans from the FFELP program that ended in 2010, also offering private loan refi for those who have graduated. Credit risks are also on the rise; the student debt forgiveness package helps consumers manage their debt loads, but the end of the payment moratorium at YE22 adds risks. The risk for private student lenders over the longer run? Shifting public attitudes over the rising cost of a higher education, and increasing pressure on the government to do something about it.



Indicators, Metrics & Stock Selection Framework

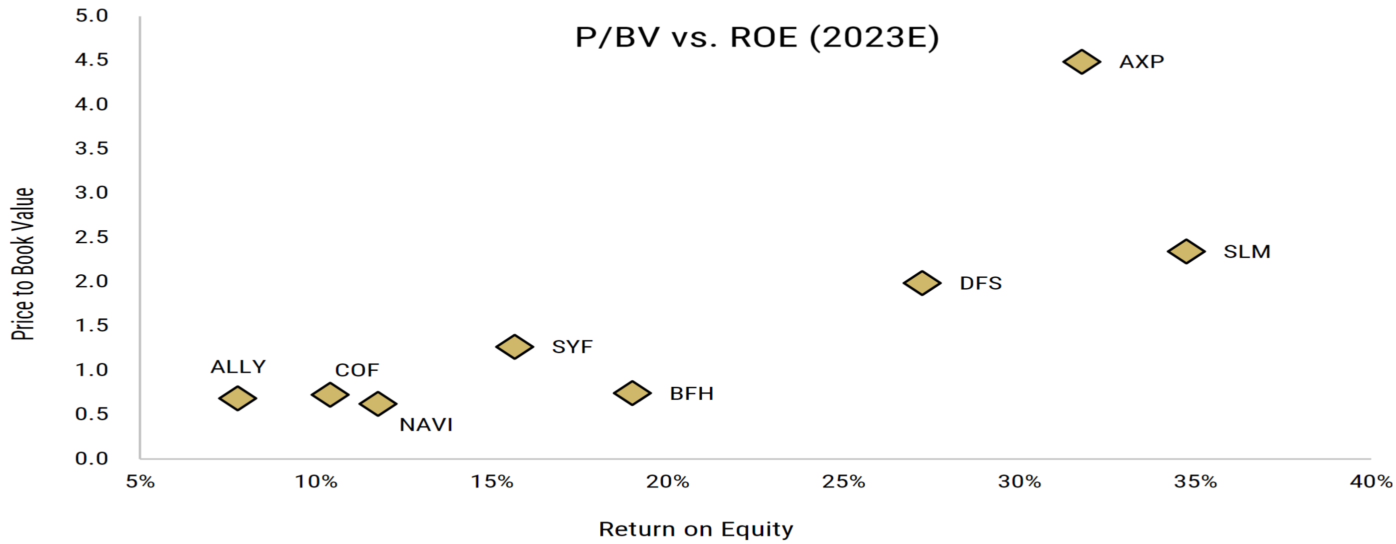
P/Book, ROE





Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EPS CAGR (FY-1 to FY0)	EPS CAGR (FY1-FY2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Consumer & Specialty							#VALUE!		#VALUE!	#VALUE!
SYF	Synchrony Financial	16.0B	4.39X	196%	1.31%	52.09%	#VALUE!	13.14%	10.98%	3.00%
ALLY	Ally Financial Inc	7.7B		176%	8.57%	64.04%	#VALUE!	7.99%	-21.52%	-5.33%
CACC	Credit Acceptance Corp.	6.0B		128%	(4.242%)	78.93%	#VALUE!	14.4%	-26.48%	3.58%
OMF	OneMain Holdings Inc	4.5B	2.17X	76%	2.36%	24.81%	#VALUE!	0.81%	-32.33%	3.11%
SLM	SLM Corp	4.1B	4.66X	36%	0.66%		#VALUE!	14.12%	-14.24%	2.84%
SOFI	SoFi Technologies Inc	4.0B	34.30X			10.57%	#VALUE!	(5.299%)	18.92%	-2.24%
QFIN	360 DigiTech Inc - ADR	3.2B	4.96X	59%	27.95%	29.14%	#VALUE!	81.4%	-30.47%	1.61%
NAVI	Navient Corp	2.3B	42.26X	-11%	(10.968%)		#VALUE!	0.59%	6.23%	-0.14%
PRAA	Pra Group Inc	1.3B	4.49X	23%		30.44%	#VALUE!	4.6%	-4.30%	-3.58%
ENVA	Enova International Inc	1.2B	2.82X	22%	17.03%	39.17%	#VALUE!	14.74%	16.12%	2.30%
LC	LendingClub Corp	1.0B		-113%	(18.191%)	42.43%	#VALUE!	1.99%	0.89%	0.69%
LPRO	Open Lending Corp	0.9B	7.10X	-261%	26.82%	58.03%	#VALUE!	107.55%	-19.51%	-15.09%
WRLD	World Acceptance Corp.	0.4B		-39%	201.47%	45.31%	#VALUE!		-73.61%	9.11%
ATLC	Atlanticus Holdings Corp	0.4B		112%		35.81%	#VALUE!		-29.87%	6.22%
LX	LexinFintech Holdings Ltd - ADR	0.4B	2.00X	186%	22.05%		#VALUE!	23.01%	-65.33%	-21.06%
TREE	Lendingtree Inc	0.3B	3.50X	-2%	134.9%	4.11%	14.80%	3.26%	-91.23%	-18.96%



Management Commentary

Synchrony (SYF) on installment loans and its value proposition…. "Listen, I think retailers that took up the kind of paying for installment lending. -- when that product took off in the marketplace, it was really about how do you even get customers. And at that point in time, people are pulling back on marketing, they're want to spend more do because they view that they were getting incrementality. I think if you talk to them today, I think they question whether or not they're getting incrementality, number one. I think number two, they look at, hey, are you taking my cost for as soon as you create a transaction, you bring them down the street somewhere else? A competitor or not a competitor, but how are you using it and whose customer is it? So I think they're questioning that then they look at us, and when we go to a partner said, listen, we think we have a multiproduct capability. We think we want to offer the right practice. And we want to do it in a way in which the consumer gives the consumer choice and the flexibility for what they want to do. When we do an installment loan, our any goal though is if I do a paid 4 or a 6-month closed-end installment through SetPay, you say, okay, I now have you as a customer, how do I get you to become a private label customer or dual card customer. You chose this product of here, but can I create greater lifetime value? And if I can get a simple takeup rate, it's no different than a cost to acquire on what we traditionally had in private-label dual cord. So our value proposition to the retailer says, "Hey, listen, if I can get that same cost to acquire and that lifetime value is a better alternative for you, and if I can do it seamlessly where the customer has choice. And I think what you're starting to see some of the other buy now pay later companies or fintech companies, they're trying to create a broader product offer because they understand that product set and where the retailers had are is not -- it can't survive on its own. So I think we're ahead of them. But I think there is a shift in the landscape where retailers are now used to you all just drive sales, drive sales, drive sales. Now it's drive sales and bring me customers and don't take my customer down the road all the time. Right."

OptionsHawk Executive Summary & Focus Stocks

It is difficult to get too excited about this group with the weakening trends though the largest name **Synchrony (SYF)** is also likely the best and EPS/Revenue estimates have actually risen since April, but still sees virtually no EPS growth the next two years. **Enova (ENVA)** is a name that stands out with strong EPS growth and rising estimates while trading 5.5X Earnings and recently authorized a $150M buyback.

<u>Financial Services – Middle Market & Business Development (BDC)</u>

Resources: [Middle Market Indicator]

Components: HTGC, FSKR, GBDC, CODI, CNNE, MAIN, ORCC, PSEC, TSLX, AFCG, FSK, BCSF

International & Private Peers

Intro

Inflation/recession concerns, and rate volatility are weighing on investor sentiment and overall profitability. Higher quality BDCs with proprietary origination platforms, scale, late-cycle portfolios, and flexible liability structures, such as Ares Capital (ARCC), Owl Rock (ORCC), and Sixth Street (TSLX) are favored. BDCs are positioned for rising rates given that portfolios are principally floating rate, and a significant level of funding is fixed. When markets normalize, BDCs should be able to gain share and generate strong risk-adjusted returns.

While BDC managers have been predictably dismissive of the event so far, the decision by MFIC (formerly AINV) to effectively slash its fees in half could prove to be a watershed moment for publicly-traded BDCs. As with every prior progressive fee commission, peers are pointing to the particular BDC's historically low investment returns. But privately, some are wondering who will be the next to 'break the buck' and take fees on a listed BDC below 1% on assets. The trajectory toward lower fees has been continuous since the dawn of the industry, but the rise of the non-traded BDC 3.0 and MFIC's coinciding fee cut are likely to cause an acceleration of more right-sized fee structures. In a world with limited opportunities for an above-NAV valuation, managers could realize that being early is better than being late—and it may make the difference between BDCs that can grow and those that cannot.

Industry Backdrop & Investment Considerations

Arguably the most important distinction that a potential BDC investor must make is between internally and externally managed BDCs. Internally managed BDCs such as Main Street Capital (MAIN), Triangle Capital (TCAP), and KCAP Financial (KCAP) generally have lower costs due to a lack of external management fees, as well as compensation incentives that are better aligned with shareholders because usually they are based on growth in NAV per share.

An imbalance between the supply of, and demand for, middle market debt capital creates attractive pricing dynamics. The directly negotiated nature of middle market financings also generally provides more favorable terms to the lender, including stronger covenant and reporting packages, better call protection, and lender-protective change of control provisions. BDC managers’ expertise in credit selection and ability to manage through credit cycles has generally resulted in BDCs experiencing lower loss rates than U.S. commercial banks through credit cycles. Historical middle market default rates have been lower, and recovery rates have been higher, as compared to the larger market capitalization, broadly distributed market, leading to lower cumulative losses.

Indicators, Metrics & Stock Selection Framework

The key metrics for BDC’s are weighted average portfolio yield, NAV/share, the non-accrual ratio, and the NII payout ratio. Interest Coverage is also closely watched.

Valuation & Comps

	Tick. Sym.	BofA Rating	S&P Rating	Total Assets ($M)	Market Cap. ($M)	Stock Price 8/23/22	BV Current	P/BV Current	Div. Yield	GAAP 2021 ROE	'22 Earn. Yield	Core '22e ROE	52 Week High	52 Week Low	Debt/ equity
Ares Capital Corp	ARCC	Buy	BBB-	$21,797	$10,205	$20.19	$18.82	1.07x	8.9%	19.5%	9.2%	9.8%	$22.93	$17.03	1.27x
FS KKR Capital Corp	FSK	NA	No rating	$17,189	$6,206	$21.91	$26.41	0.83x	11.9%	28.0%	12.6%	10.1%	$23.45	$18.09	1.24x
Owl Rock Capital Corp	ORCC	Buy	BBB-	$13,088	$5,240	$13.31	$14.48	0.92x	9.4%	10.7%	9.4%	8.4%	$15.33	$12.09	1.24x
Blackstone Secured Lending Fund	BXSL	Neutral	No rating	$10,383	$3,982	$24.09	$25.89	0.93x	11.6%	11.9%	10.7%	9.9%	$37.67	$21.81	1.33x
Prospect Capital Corp	PSEC	NA	BBB-	$7,496	$3,122	$7.96	$10.81	0.74x	9.0%	25.2%	9.4%	6.9%	$9.06	$6.66	0.61x
Main Street Capital Corp	MAIN	NA	BBB-	$3,826	$3,182	$42.28	$25.39	1.67x	6.6%	20.0%	7.0%	11.4%	$46.84	$34.28	1.00x
Golub Capital BDC Inc	GBDC	Neutral	BBB-	$5,770	$2,369	$13.86	$15.14	0.92x	8.7%	12.2%	9.5%	8.6%	$16.23	$12.62	1.21x
Hercules Capital Inc	HTGC	NA	No rating	$2,870	$1,869	$14.69	$10.43	1.41x	11.8%	13.4%	9.2%	12.5%	$18.72	$12.49	1.13x
Sixth Street Specialty Lending Inc	TSLX	Buy	BBB-	$2,580	$1,549	$19.12	$16.27	1.18x	9.5%	17.4%	9.3%	10.5%	$24.20	$18.02	1.01x
Oaktree Specialty Lending Corp	OCSL	NA	No rating	$2,689	$1,279	$6.98	$6.89	1.01x	9.4%	18.4%	10.4%	10.0%	$7.81	$6.20	1.07x
New Mountain Finance Corp	NMFC	Buy	No rating	$3,405	$1,333	$13.24	$13.42	0.99x	9.1%	16.3%	9.2%	8.9%	$14.11	$11.09	1.46x
Bain Capital Specialty Finance	BCSF	Neutral	No rating	$2,426	$950	$14.72	$17.15	0.86x	9.2%	11.1%	9.9%	8.5%	$16.29	$13.38	1.12x
MidCap Financial Investment Corp	MFIC	U/P	No rating	$2,635	$841	$13.25	$15.52	0.85x	10.1%	11.8%	11.4%	9.6%	$13.87	$10.01	1.62x
Goldman Sachs BDC Inc	GSBD	NA	No rating	$3,678	$1,774	$17.36	$15.53	1.12x	10.4%	11.9%	10.8%	11.9%	$20.60	$15.87	1.27x
BlackRock TCP Capital Corp	TCPC	Buy	No rating	$1,873	$795	$13.76	$13.97	0.98x	8.7%	16.8%	10.6%	10.2%	$14.52	$11.76	1.29x
SLR Investment Corp	SLRC	NA	No rating	$2,392	$813	$14.84	$18.53	0.80x	11.1%	7.0%	8.4%	6.4%	$20.05	$13.74	0.98x
Carlyle Secured Lending Inc	CGBD	Buy	No rating	$2,046	$739	$14.25	$16.81	0.85x	10.5%	18.3%	11.6%	9.7%	$14.85	$12.06	1.17x
Barings BDC Inc	BBDC	Buy	No rating	$2,829	$1,102	$10.09	$11.41	0.88x	9.4%	10.6%	10.1%	8.6%	$11.55	$9.18	1.22x
Crescent Capital BDC Inc	CCAP	Buy	No rating	$1,323	$548	$17.74	$20.69	0.86x	10.1%	13.8%	9.0%	7.5%	$21.30	$15.06	1.02x
PennantPark Investment Corp	PNNT	NA	No rating	$1,431	$424	$6.49	$9.65	0.67x	9.8%	19.1%	11.1%	7.2%	$8.02	$5.99	1.18x
BlackRock Capital Investment	BKCC	NA	No rating	$585	$288	$3.94	$4.57	0.86x	10.2%	20.0%	9.1%	7.7%	$4.38	$3.43	0.71x
First Eagle Alternative Capital BDC Inc	FCRD	NA	No rating	$386	$98	$3.28	$5.30	0.62x	12.9%	9.4%	-18.9%	-10.1%	$4.89	$3.23	1.40x
						Average		**0.95x**	**9.9%**	**15.6%**	**8.6%**	**8.4%**			**1.16x**
Cliffwater BDC Index - Total Return	CWBDC					$3,658	$3,903	0.94x	10.1%	15.8%	NA	9.3%	$3,954	$3,210	

Management Commentary

FS KKR Capital (FSK) on private debt markets and portfolio companies…."Our belief is based on the view that, before the Fed began increasing interest rates, the private debt market already had established itself as an attractive alternative to the syndicated debt markets. As a result, going forward, we believe sponsors are likely to continue to trust the execution capabilities of the largest platforms in the private debt industry. Despite the current market backdrop, the vast majority of our portfolio companies continued to experience solid fundamental performance, which we attribute to our focus on larger companies at the upper end of the middle market. Companies with strong competitive positions, resilient cash flows and businesses in noncyclical industries. While assessing our sector exposure today, we take comfort in the fact that we have focused on more defensive industries over the past several years as our top industry exposures today include software services, health care services and insurance services businesses, which represent approximately 37% of our portfolio. This compares to more cyclical and volatile sectors, such as materials, capital goods and energy, which represented approximately 34% of the total portfolio at the end of the second quarter of 2018 and today represent only 17% of our portfolio."

Owl Rock (ORCC) on higher rate impact and direct lending markets…."We have seen a dramatic move in base interest rates with SOFR up roughly 350 basis points this year. The impact of this move drove our third quarter results and will further increase earnings in the fourth quarter. The earnings power of our portfolio is strong and growing. We are announcing today that we expect to earn at least $0.39 of net investment income per share in the fourth quarter. This estimate assumes a continuation of the very low repayment environment we have seen and any increase in repayment activity in future quarters would provide further upside to NII. We have always focused on investing in stable, noncyclical annuity-like businesses in sectors like software, insurance brokerage and health care. Our investments are primarily first lien loans and are supported by significant equity cushions with an average loan-to-value ratio of roughly 45%. The current market opportunity for direct lending is probably the best we have seen since we started Owl Rock in 2016. Public markets are effectively shut and sponsors are primarily turning to direct lenders. On new loans, we're typically earning more than 11% with extended call protection, attractive leverage profiles and credit protections for high-quality, strategically important companies. Given our scale and resources, we are continuing to see solid deal flow and having excellent competitive success in leading highly attractive investment opportunities."

OptionsHawk Executive Summary & Focus Stocks

I am not overly compelled to invest in this group considering the complexity and difficult environment but **FS KKR Capital (FSK)** looks to be the strongest name on earnings yield and cheap valuation while having a less cyclical portfolio in a weaker Macro environment.

REITS – Diversified

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute

Components: WPC, VNO, LXP, JBGS, KW, AAT, WRE, ALEX, GNL, ALX

International & Private Peers: Mitsui Fudosan, Sung Hun Kai, Stockland

Intro

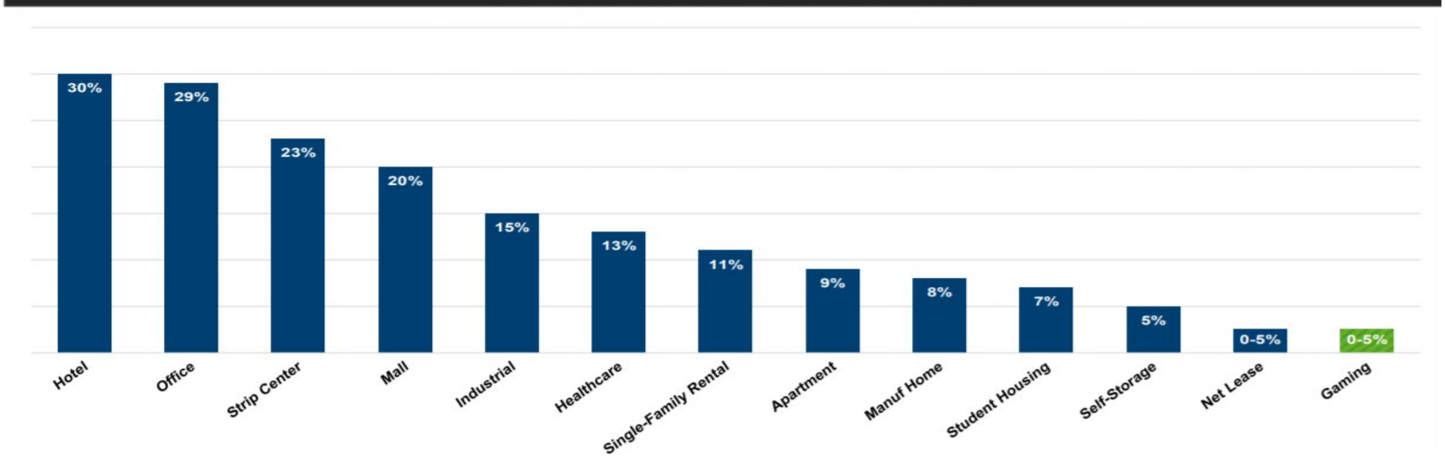
REITs only outperformed the S&P 3 out of 10 months. YTD all subsectors were negative as Office (-35.1%), Data Centers (-35.0%), Manufactured Housing (-31.3%) and Infrastructure (-30.6%) lagged while Lodging/Resorts (-3.7%), Triple Net (-9.7%), Shopping Centers (-15.4%) and Diversified (-16.6%) led. Multiple compression from higher real rates is the biggest headwind for REITs. As GDP growth slows in 23e/24e and inflation fears ease, that may put continued downside pressure on real rates that are near cycle highs. An environment where real rates have peaked, and GDP growth is below trend may be supportive of REIT defensive characteristics and multiples.

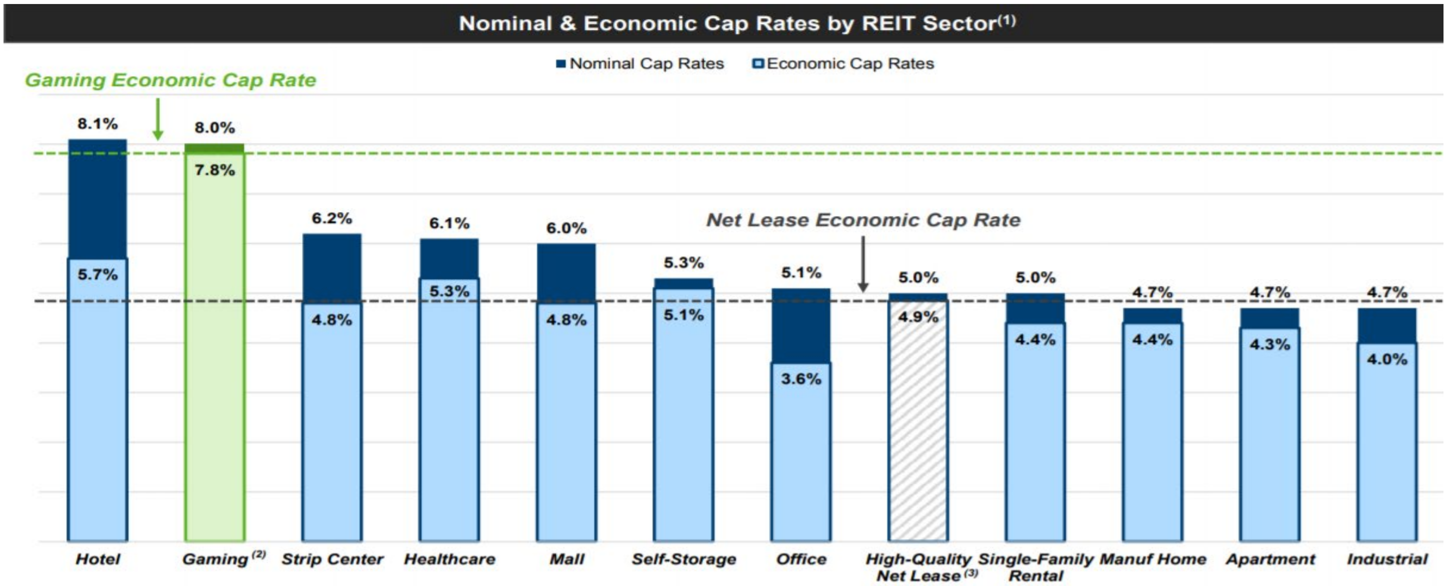
Industry Backdrop & Investment Considerations

REIT relative outperformance shows a strong correlation with tightening financial conditions as shown with the MS Financial Conditions Index.

Real Estate Sector	Market Cap ($B)	% of US Listed Market	Economic Drivers	Key Tenants	Lease Duration
Office	98.2	9.8	Corporate Profits, Business Segment Growth, GDP	Corporations, Professional Service Industries	5–10 yrs
Industrial	58.4	5.8	Consumer Spending, Retail Sales	Logistics, Manufacturing, Retailers	3–5 yrs
Regional Malls	117.1	11.7	Disposable Income, Consumer Sentiment	Soft Good Retailers, Jewelry, Department Stores	7–10 yrs (in-line)
Shopping Centers	79.3	7.9	Consumer Spending, CPI, Population	Grocery and Drug, Local Necessity Retail	3–5 yrs (in-line)
Single Tenant Retail	37.7	3.8	Consumer Spending, CPI, Population	Restaurants, Banks, Gas/Convenience	10–15 yrs
Multi-Family	113.4	11.3	Age Cohort Growth, Interest Rates	21–35 yrs and 65+ Age Cohorts	9–12 months
Manufacturing Housing	12.0	1.2	Interest Rates, Population, Age Cohort Growth	55+ Age Cohort, Lower Middle Class Families	Various
Diversified	54.2	5.4	Various	Various	Various
Lodging	41.8	4.2	Business Spending, Disposable Income, Consumer Sentiment	Business and Leisure Travel	Daily (consumer); 10–15 yrs (management contract)
Health Care	104.9	10.5	Aging Population, Government	65+ Age Cohort	9–12 months (resident); 10–15 yrs (management contract)
Self Storage	66.4	6.6	Population	Adults	Monthly
Timber	27.3	2.7	Construction, New Home Sales	Construction Industry	Various
Mortgage REITs	55.9	5.3	Interest Rates, Health of the Financial System	Real Estate Owners	3–10 yrs[a]

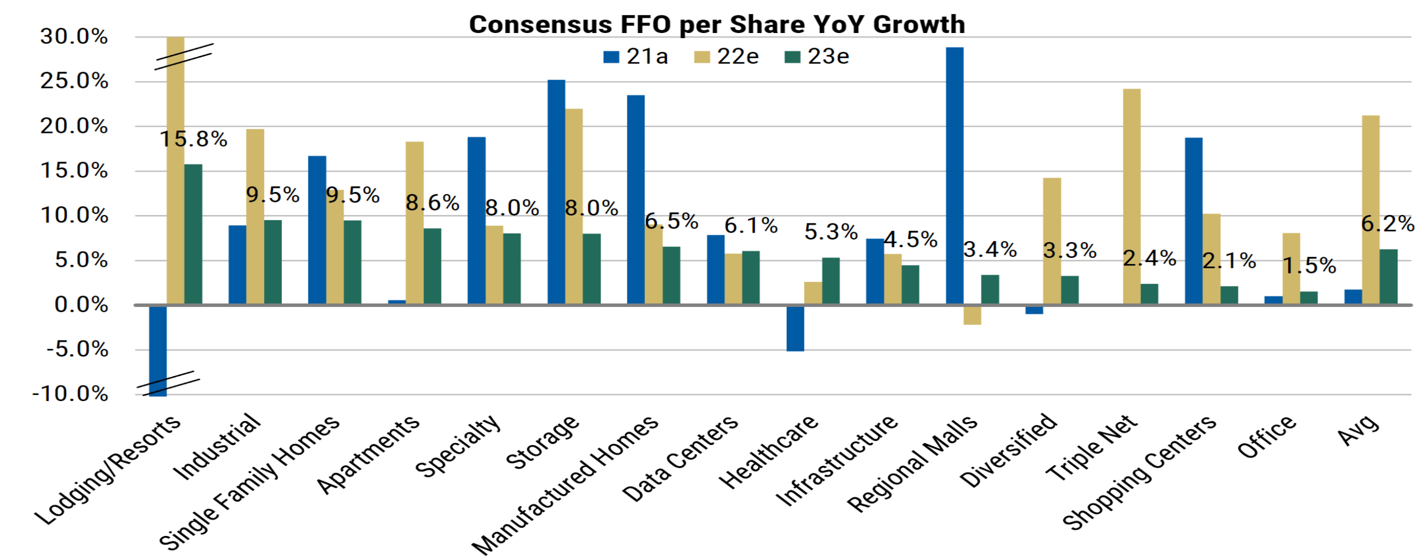
Cap-Ex by Real Estate Sector *(as % of NOI)*





Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector.



Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Diversified REIT								#VALUE!
WPC	WP Carey Inc	16.5B	15.72X	3.19%	5.49X	5.34%	6.05X	-1.94%
VNO	Vornado Realty Trust	4.3B	7.28X	-3.54%	2.74X	9.64%	9.97X	-1.59%
LXP	LXP Industrial Trust	2.9B	15.75X	-5.95%	5.58X		4.73X	1.52%
KW	Kennedy-Wilson Holdings Inc	2.3B			4.53X	5.75%	5.18X	#VALUE!
JBGS	JBG SMITH Properties	2.3B	15.26X	-2.99%	4.19X		7.30X	-2.96%
AAT	American Assets Trust, Inc	1.6B	11.54X	9.09%	3.69X	5.16%		7.37%
ALEX	Alexander & Baldwin Inc (Hawaii)	1.4B	21.93X	5.00%	5.24X	4.00%	3.96X	-1385.71%
GNL	Global Net Lease Inc	1.4B	8.17X	-0.91%	3.15X		7.54X	-6.21%
ALX	Alexander's, Inc.	1.2B	14.03X	-13.04%	5.65X		6.06X	5.58%

Management Commentary

WP Carey (WPC) on investment opportunities with its dry powder and it being well positioned…. "I would outline 3 key reasons why W. P. Carey remains uniquely positioned within net lease. First, in a more challenging investment environment, we have the ability to drive higher AFFO growth through our best-in-class contractual same-store rent growth, which reached 3.4% for the third quarter. As current inflation flows through to rents, we expect our contractual same-store rent growth to move even higher in 2023 to between 4% and 4.5% and to continue seeing the benefits into 2024. And with over $2 billion of total liquidity, we're confident in our ability to continue investing in appropriately priced opportunities. Third, we're benefiting from our recently completed merger with CPA:18, which resulted in better accretion than we initially anticipated, with gains from high-quality real estate AFFO more than offsetting the loss of investment management earnings. Given strong self-storage fundamentals, these assets incrementally provide a tailwind to our growth. Within our diversified approach, we've remained primarily focused on warehouse and industrial, which comprised about 80% of our third quarter acquisitions. Recently, however, deal pricing has become incrementally more interesting, and we believe market conditions are turning in our favor. We're actively exerting our pricing power and new deals, demanding higher yields, which we're beginning to achieve. W. P. Carey is ideally positioned for the current environment, having raised well-priced capital and sitting on over $2 billion of liquidity, and we're poised to capitalize on appropriately priced opportunities as they arise. We're able to exert pricing power amid a smaller pool of buyers and sellers are beginning to acclimate to higher cap rates. Until cap rates more broadly align with funding costs, however, the capital we've raised at attractive prices will allow us to continue investing in the best opportunities, and we'll continue benefiting from our sector-leading inflation-driven rent growth."

OptionsHawk Executive Summary & Focus Stocks

This is a small group and **American Asset (AAT)** a small cap that stands out with a $1.6B market cap expecting strong FFO growth while trading at a steep discount, 11.5X FFO and offering a 5% yield with rising estimates. The largest name of the group, **WP Carey (WPC)** looks stable as well but trades 15.7X.

<u>REITS – Apartment & Single Family</u>

Resources: [Nareit](), [REITs-Market](), [REIT Notes](), [REIT Institute]()

Components: AVB, EQR, INVH, MAA, SUI, ESS, UDR, CPT, ELS, AMH, AIRC, IRT, BNL, JOE, NXRT, AIV

International & Private Peers: Vonovia SE, Deutsche Wohnen, Link REIT, Aroundtown SA, Castellum AB

Intro

Operational updates ahead of NAREIT from Apartment REITs highlighted decelerating new lease growth on tougher y/y comps and return of seasonality into the business, with renewal lease growth that has remained more resilient. Single Family Rental (SFR) are seeing fundamentals that remain significantly stronger than pre-COVID averages, but in the case of new leases growth that has decelerated from prior month/quarter y/y growth. The debate is whether new lease growth stabilizes above trend (or decelerates back to mid-single digits, or below, like apartments) and where SS-NOI therefore shakes-out given expense pressures from taxes and a variety of other items.

Residential REITs reported 3Q22 results and for the first time in multiple quarters, signs of weakness emerged across multiple facets of the industry. Concessions have re-emerged, primarily in SFO and Seattle, but companies also talked about other markets as well, including Washington DC, Boston, and the Mid-Atlantic. Meanwhile, bad debt is expected to stay elevated in 2023, as the recourse provided from rental assistance payments is now essentially over, and getting dues from past tenants will be a long-drawn-out process. While inflationary pressures were expected across REITs property taxes turned out to be a bigger surprise as companies spoke to under accruals, higher property assessment values, and potential for higher millage rates. Cap rates have risen over 100bps on average, and asset values are down >10% from peak, but transaction volume remains thin and investors remain in price discovery mode. Pricing power has started to moderate but the magnitude of deceleration is varied and many saw vacancy rate pick up.

Industry Backdrop & Investment Considerations

At the most fundamental level, employment and population growth, combined with home ownership rates, ultimately drive demand for residential product, and given that these dynamics differ across markets, it is necessary to evaluate companies based on their geographic portfolios, and the ecosystems that they operate in. GDP growth and employment growth are key tenets of rental demand. Historically, the coastal markets have been viewed as centers of excellence, driving job growth, GDP, innovation, income growth, and attracting younger talent.

Coastal Recovery, Sunbelt Strength: Migration trends from coastal to the sunbelt that were present even before the pandemic bode well for residential REITs over-indexed to the sunbelt markets. Investments in technology continue to be prevalent across the industry as companies look to enhance the tenant experience, drive efficiencies and improve margins. Landlords are looking to monetize a larger portion of their real estate and create additional revenue streams by offering services to tenants.

The Millennial generation is edging into the homeownership stage of their life; however, the Gen Z cohort is gearing up to take their place and should fuel rental housing demand going forward.

Apartment REIT Exposure:

Region	AVB	EQR	ESS	UDR	AIRC	CPT	MAA	Avg
So. California	22%	28%	43%	21%	32%	8%	0%	22%
No. California	16%	16%	41%	8%	9%	0%	0%	15%
Mid-Atlantic	20%	16%	0%	22%	28%	11%	6%	14%
Metro NY/NJ	19%	14%	0%	6%	0%	0%	0%	8%
Pacific NW	7%	11%	17%	7%	0%	0%	0%	7%
Mid-West	0%	0%	0%	0%	0%	0%	0%	0%
New England	13%	11%	0%	11%	11%	0%	0%	7%
Southeast	3%	1%	0%	12%	8%	37%	54%	14%
Southwest	1%	4%	0%	7%	7%	45%	31%	11%
Other	0%	0%	0%	6%	6%	0%	9%	2%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. FFO growth has long correlated to share price performance across this group.

Residential REITs generate same-store growth through a delicate balance of rental rate growth and occupancy gains — both of which are a function of demand and supply fundamentals in their existing locations. After a turbulent year, much like the rest of the economy, rental rates are witnessing a strong rebound in 2021. YTD asking rents (through mid-Aug) across the country are tracking +6.7% YoY on average, with 2Q accelerating to +7.2% from +2.2% in 1Q, and a sharp contrast to essentially flattish (+0.6%) rents in 2020.

Three key factors include existing location dynamics for internal growth, portfolio expansion and recycling opportunities for external growth and execution. JOLTS data is an important proxy for future job and housing demand for the residential REITs.

Companies with low leverage and strong liquidity leads to a lower cost of capital, provides ballast in economic downturns and offers flexibility for growth opportunities. Average ROIC for the sector is 3.6%. Returns on invested capital have generally been highest for apartment REITs, followed by SFR, and then student housing.

Valuation & Comps

Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Apartment and Single Family								
EQR	Equity Residential	24.0B	18.00X	7.49%	5.20X	3.92%	5.64X	2.02%
AVB	AvalonBay Communities Inc	24.0B	17.65X	12.45%		3.72%	5.00X	0.88%
INVH	Invitation Homes Inc	19.0B	18.81X	10.49%	3.63X	2.83%	6.50X	-1.49%
MAA	Mid-America Apartment Commun	18.9B	19.33X	14.15%	6.60X	2.86%	4.35X	4.03%
SUI	Sun Communities Inc	17.8B	19.70X	7.49%	6.03X		5.07X	0.14%
ESS	Essex Property Trust Inc	14.2B	15.09X	10.69%	5.17X	4.02%	5.75X	2.88%
UDR	UDR, Inc.	13.1B	17.29X	11.81%	6.17X	3.76%	5.85X	1.30%
CPT	Camden Property Trust	12.4B	17.62X	15.03%		3.21%	4.09X	1.30%
ELS	Equity LifeStyle Properties Inc	12.1B	24.21X	4.96%	5.22X	2.50%	5.15X	-2.58%
AMH	American Homes 4 Rent	11.5B	20.97X	11.04%		2.20%	5.05X	-1.59%
AIRC	Apartment Income REIT Corp	5.5B	15.26X	6.74%	3.30X	4.90%	9.22X	-0.41%
IRT	Independence Realty Trust Inc	4.0B	16.60X	17.72%	3.54X	3.06%	13.99X	2.86%
BNL	Broadstone Net Lease Inc	3.0B	11.64X	8.07%	4.29X	6.21%	5.65X	2.03%
JOE	St Joe Co	2.1B	0.00X					
AIV	Apartment Investment and Manag	1.2B	2.87X	8.62%	1.41X		13.96X	0.00%
NXRT	NexPoint Residential Trust Inc	1.2B	15.88X	16.41%	3.54X	3.36%	13.46X	0.43%

Management Commentary

Equity Residential (EQR) on its customers, cycle peak, and housing markets….“Looking at it from the top of the house, we like our affluent renter customer and what we expect will be their financial and employment resiliency going into uncertain times. Our target resident is high-earning and employed in knowledge industries, with more durable incomes and employment prospects. Finally, although high inflation has impacted everyone's real incomes, our affluent renter is relatively more insulated due to their higher incomes and lower rent-to-income ratios. On the apartment supply side, we see national apartment deliveries reaching a cycle-high point in 2023. However, in the coastal markets where most of our properties are still located, we see supply as being lower and being delivered further away from our properties than in the past and thus likely less impactful. In addition, other housing alternatives remain expensive and in low supply. Though they have been declining of late, current single-family home prices continue to be at record levels, while rising mortgage rates have further stressed affordability, particularly for first-time homebuyers. Single-family housing starts are declining, existing homeowners are more reluctant to sell due to low locked-in mortgage rates along with minimal and expensive for sale replacement options, and competition for homes from investors remain strong.”

Mid-American (MAA) on the Sunbelt and RE taxes…. “But absent a severe recession taking place with the resulting weakness in the employment markets, we expect the demand for apartment housing across our portfolio to continue to be strong. At this point, we've not seen any evidence of weakness in the drivers of demand for apartment housing as it applies to our Sunbelt portfolio. Of the leases written in the third quarter, 15% of our new residents were relocating to the Sunbelt from coastal markets. This is comparable to the trends we saw last year. It's also worth noting that the move-outs we had in the third quarter, only 5% were moving out of the Sunbelt. This is also consistent with last year's trends. Real estate taxes made up the biggest portion of the variance from our expectations for the third quarter this year. We received a significant amount of information during the quarter, particularly in Florida, reflecting some pressure in both values and millers rates as compared to our expectations. We will continue to aggressively challenge values where we can, but we now expect our real estate tax expense to be at the higher end of our previous range."

OptionsHawk Executive Summary & Focus Stocks

This group features many of the larger REITs and most of this group as solid forward-growth outlooks. **Mid-American (MAA)** screens as the strongest grower with the sharpest upward estimate revisions while valuation is in-line with averages, a top name with its exposure to the Southern markets. **Camden (CPT)** is the other favored name in this group while **Equity Lifestyles (ELS)** looks sharply overvalued with weak growth and declining estimates as a potential short. **NeexPoint (NXRT)** and **Broadstone (BNL)** are two attractive small cap growers while **Independence (IRT)** also has impressive metrics, a group with many opportunistic buys.

REITS – Healthcare

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute

Components: WELL, VTR, PEAK, HR, MPW, OHI, DOC, SBRA, NHI, CTRE, LTC, CHCT, UHT

International & Private Peers: Goodman Group, Icade SA

Intro

The key types of healthcare facilities that REITs invest in include: senior housing communities (independent living, assisted living, and CCRCs), skilled nursing facilities (SNFs), hospitals, medical office buildings (MOBs), and life science properties. Unlike other REIT sectors that typically only have one type of business, the healthcare REITs are able to diversify their investments by business and payor mix. For example, the four types of healthcare facilities have varying pay mechanisms: senior housing (private pay), skilled nursing (public pay), hospitals (public pay), and medical office buildings/life science (private pay).

The Senior Housing recovery thesis is gaining traction as occupancy is gaining and pricing hitting records. 7-10% rent growth on renewals are on the table in 2023. Life sciences fund raising may be down from record but remains elevated.

Industry Backdrop & Investment Considerations

The key drivers of healthcare REIT property fundamentals include aging demographics, proximity to the oldest daughter (often the caregiver for aging parents), and proximity to the nearest hospital. Healthcare REITs are generally thought of as relatively defensive, given that the industry is necessity based (there are always people getting older who need care) and the predominance of the triple net lease structure, assuming current rent levels are sustainable.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector.

Valuation and Comps

Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Healthcare								
WELL	Welltower Inc	31.1B	19.63X	6.24%	3.66X	3.71%	7.35X	-5.24%
VTR	Ventas, Inc.	18.3B	15.38X	2.33%	3.35X	3.96%	7.84X	-1.65%
PEAK	Healthpeak Properties Inc	13.6B	14.57X	4.41%	6.33X	4.75%	6.14X	0.58%
HR	Healthcare Realty Trust Inc	7.4B	11.81X	-2.63%	5.41X	6.32%	5.86X	-8.06%
MPW	Medical Properties Trust Inc	7.1B	6.54X	14.27%	3.58X	9.78%	6.77X	-1.63%
OHI	Omega Healthcare Investors Inc	6.9B	9.91X	-3.58%		9.07%	5.64X	4.36%
DOC	Physicians Realty Trust	3.4B	14.21X	1.19%		6.16%	5.17X	-3.05%
SBRA	Sabra Health Care REIT Inc	2.9B	8.40X	-3.43%		9.54%	6.04X	-1.95%
NHI	National Health Investors Inc	2.5B	12.52X	-0.54%		6.34%	6.21X	0.69%
CTRE	Caretrust REIT Inc	1.9B	13.23X	0.57%	7.35X	5.59%	3.39X	0.68%
LTC	LTC Properties Inc	1.6B	15.15X	3.05%		5.89%	6.01X	-1.36%
CHCT	Community Healthcare Trust Inc	0.9B	15.32X	5.27%	6.01X	5.08%	3.76X	-0.44%
UHT	Universal Health Realty Income Tr	0.7B					5.92X	0.00%

Management Commentary

Welltower (WELL) on Senior Housing and rates…. "In our senior housing operating business, same-store revenue is up 10.8% year-over-year, driven by strong occupancy gains and most importantly, pricing power. 5.3% same-store rate growth is the best we have seen in our recorded history. And I want to remind everyone that we're compounding already industry-leading rate growth from last year. We strongly believe that labor market is changing for the better, and it will help our sector to be a total standout amongst all real estate sectors next year on a relative basis. One, we're unlevered IRR buyers and we underwrite significant cap rate expansion at exit. Hence, the recent rate increase don't fluster us just as we have never chased low rates down under the guise of low cost of capital. Two, our unrelenting focus on basis relative to replacement cost, and as a result, we seriously dislike low cap rates in stabilized occupancy scenarios. Nothing has happened so far, even in this turbulent capital markets backdrop that require us to change how we invest capital."

Healthpeak (PEAK) on Life Sciences opportunity…. "We'll focus on life science and medical office, where we have the scale and expertise to maximize value creation while minimizing risk. These are both high-margin businesses that are aligned with the modern economy. Our real estate is and will be dedicated to human health, a highly valued asset now more than ever. Life Science in the U.S. is a unique public-private partnership that leads the world in biotech innovation, with more than $200 billion per year spent on drug research and accelerating science, we expect a long-term virtuous cycle that will support demand for our buildings. Meanwhile, the need for cost-effective and convenient health care will drive demand for our MOBs, especially as the population ages. Public biopharma R&D spending through the first half of the year was $77 billion, which is 8% higher than the first half of last year and is on pace to challenge 2021 as the highest R&D spending year ever."

OptionsHawk Executive Summary & Focus Stocks

Healthpeak (PEAK) is the preferred large cap of this group screening better than peers across all metrics and has a nice opportunity in Life Sciences which should be a resilient space. **Community (CHCT)** remains a favored small cap grower with its exposure to outpatient growth while **LTC (LTC)** a solid small cap for exposure to the Senior Living recoveyr.

REITS – Industrial

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute

Components: PLD, REXR, EGP, COLD, FR, STAG, TRNO, IIPR, GOOD, ILPT

International & Private Peers: Sagax AB, Warehouse de Pauw, Mapletree Logistics Trust

Intro

Industrial is not seeing signs of demand weakness yet but management teams are mindful about a slowing macro environment. Modest rent growth next year may be supported by normalizing but still low availability while supply remains constrained. Industrial REITs have seen considerable accretion from development pipelines with yields on costs of ~6.5% and implied cap rates/debt costs ~3.5%/~3% over the past ~2 years. In 2023 we should see record tight markets loosen while rent growth remains positive. After a record pace of retail inventory growth there is now a slowdown in the pace of inventory growth. The pace of industrial demand may decelerate as well given the historical relationship demand has had with inventory growth. The current space under construction at the national level is at record highs of 720mn SF and 4.0% of stock.

Industry Backdrop & Investment Considerations

The Industrial REIT group is one of the strongest areas with the demand for distribution centers and logistics and sits at the heart of facilitating working through supply chain issues.

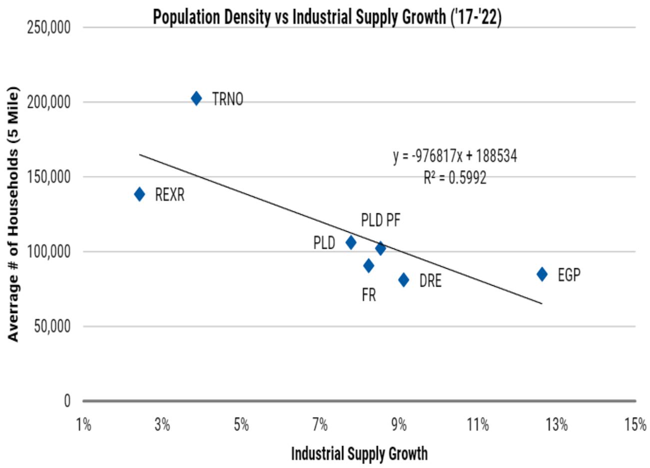
Industrial demand remains strong, driven by Ecommerce sales, the change in US inventory levels, trade volumes (imports and exports of goods), and US manufacturing output.

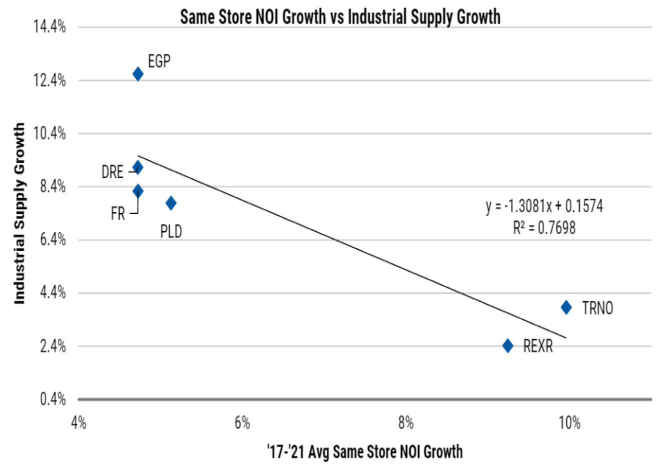
Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA. For internal growth strong leading spreads and occupancy upside potential are key drivers while external growth is driven by development potential, accretive acquisitions and dispositions.

Valuation & Comps

Price/FFO vs. FFO CAGR (FY0 to FY2)





Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Industrial								
PLD	Prologis Inc	109.0B	23.02X	16.36%	17.32X	2.67%	3.62X	-0.35%
REXR	Rexford Industrial Realty Inc	10.7B	28.32X	15.00%	7.36X	2.30%	4.05X	-0.10%
COLD	Americold Realty Trust Inc	7.7B	31.67X	4.72%	4.78X	3.07%	5.66X	25.69%
EGP	Eastgroup Properties Inc	6.7B	22.25X	10.35%	8.47X	3.00%	4.96X	2.27%
FR	First Industrial Realty Trust, Inc.	6.6B	22.21X	8.29%	6.53X	2.35%	4.81X	3.69%
STAG	Stag Industrial Inc	6.0B	15.17X	4.32%	6.29X	4.37%	4.87X	1.38%
TRNO	Terreno Realty Corporation	4.4B	28.96X	10.77%	7.68X	2.55%	3.13X	1.02%
IIPR	Innovative Industrial Properties In	3.1B	13.09X	15.69%	8.95X	6.46%	0.79X	-3.24%
GOOD	Gladstone Commercial Corporatio	0.8B	11.93X	0.38%	3.54X	7.75%	7.13X	1.87%
ILPT	Industrial Logistics Properties Trus	0.2B	2.63X	-21.09%	3.79X	19.21%	6.08X	-16.88%

Management Commentary

Prologis (PLD) on market conditions…."We continue to see scarcity of available space across our markets. Vacancy rates are at historic lows, and our own occupancy sits at a record high. Market rent growth in the third quarter remained robust in response to this scarcity and continued strong demand. Color across the markets remains generally upbeat in terms of customer inquiries, and our proprietary metrics also reveal healthy activity even if they've softened from the peak demand generated during COVID to levels still above long-term averages. Transaction gestation was stable during the third quarter at 62 days, proposals via available units slowed during the third quarter to levels more in line with the pace of 2019 and indicative of less urgency to renew space far ahead of exploration. Shifting to supply. We're seeing initial signs of a deceleration in development activity across our markets as construction and capital costs continue to increase. We believe we could see a gap in deliveries emerge in late '23 or early '24. As for today, our true months of supply metrics sits at a healthy 22 months, up from 18 months last quarter. We've previously explained that we expect to see this metric climb into a low 30 months range, still at a level reflecting a strong operating environment."

Rexford (REXR) on its markets…. "Our infill Southern California industrial markets continue to demonstrate strong fundamentals with historically high market occupancy at 99%. The ongoing supply/demand imbalance within our infill markets is expected to persist into the foreseeable future due to a dearth of developable land and diminishing supply over time. The extraordinary pace of market rent growth moderated during the third quarter but remains strong and well above historical levels. Rexford remains well positioned with our low leverage, fortress-like balance sheet that enables us to opportunistically capitalize upon accretive investment opportunities that may result from market shifts or uncertainty. Our strong position also emanates from our exclusive focus on an infill Southern California tenant base. Our infill locations have proven through cycles to be critical to the operations of our tenants across an exceptionally diverse array of industries serving a regional economy that ranks as 1 of the largest in the world. Our tenants are also operating within an infill market with exceedingly scarce available space. These factors contribute to what we believe to be the strongest, most stable and most dynamic industrial tenant base in the nation."

OptionsHawk Executive Summary & Focus Stocks

The strongest REIT group has plenty of names with FFO growth seen ahead but also comes at premium valuations. **ProLogis (PLD)** fits into the bucket of the high-quality names but maybe not best for 2023 with it at 23X FFO and some M&A integration headwinds. **Eastgroup (EGP)** is a favorite smaller cap name with a $6.7B market cap and seeing positive revisions. TRNO and REXR are also quality growers in this group but trade 28X FFO. **Stag (STAG)** is the best value at 15X FFO though with a softer growth outlook.

REITS – Lodging & Entertainment

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute

Components: VICI, HST, GLPI, RHP, APLE, EPR, PK, SHO, PEB, RLJ, DRH, XHR, SVC, TH, INN

International & Private Peers: Hotel Property Investments

Intro

The gaming sector remains a key safe haven as gaming revenues are well past COVID levels and rent coverage remain healthy at 2x or higher. The companies are focused on execution and building out the deal pipelines. Gaming REITs are a defensive way to play the cyclical Gaming space with fixed rents (and +2% escalator), ~2x rent coverage and a relative attractive cost of capital vs the gaming operators as well as some other REITs. VICI's strategies and ability to deploy capital on a large scale, internationally and in both gaming and non-gaming verticals widens its total addressable market which is important given the $48B EV asset base. GLPI continues to focus on regional gaming space which remains very fragmented, also creating a long runway for growth at their size ($12B EV).

Industry Backdrop & Investment Considerations

Lodging REITs tend to be more sensitive to the macro environment due in part to their exposure to high-end chain scales (in tough times, businesses and consumers trade down, mitigating downside) and greater operating leverage.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA. RevPAR is looked at in this group similar to the Hotel C-Corps.

Valuation and Comps

Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Lodging/Entertainment								
VICI	VICI Properties Inc	34.0B	17.75X	7.83%	3.33X	4.38%	4.20X	0.52%
GLPI	Gaming and Leisure Properties Inc	13.3B	14.61X	3.93%	3.87X	5.51%	5.08X	-1.94%
HST	Host Hotels and Resorts Inc	12.9B	10.17X	76.58%	3.17X	1.75%	6.59X	8.59%
RHP	Ryman Hospitality Properties Inc	5.0B	14.86X	182.43%	1.41X	0.14%	15.22X	3.24%
APLE	Apple Hospitality REIT Inc	3.9B	11.05X	10.25%	30.57X	3.42%	5.82X	3.68%
EPR	EPR Properties	3.1B	8.74X	111.98%	2.59X	7.96%	6.74X	3.10%
PK	Park Hotels & Resorts Inc	2.9B	8.58X		0.55X	1.06%	28.71X	2.05%
SHO	Sunstone Hotel Investors Inc	2.2B	13.14X	381.66%	1.96X	0.94%	6.59X	12.50%
PEB	Pebblebrook Hotel Trust	2.1B	8.97X		0.91X	0.25%		-0.86%
DRH	Diamondrock Hospitality Co	1.9B	9.28X	194.82%	1.97X	0.72%	13.48X	26.11%
RLJ	RLJ Lodging Trust	1.9B	8.45X	208.22%	1.52X	0.99%	10.59X	5.28%
XHR	Xenia Hotels & Resorts Inc	1.8B	10.11X	143.34%	1.33X	1.54%	9.08X	11.44%
TH	Target Hospitality Corp	1.5B			3.08X		2.85X	
SVC	Service Properties Trust	1.3B	5.49X	130.54%	1.16X		14.56X	35.78%
INN	Summit Hotel Properties Inc	0.9B	8.96X	80.71%	1.69X	1.24%	14.21X	-4.62%

Management Commentary

VICI Properties (VICI) on inflation and investments….“I would say in an inflationary environment where our G&A is so screamingly low as a percentage of revenue, inflation obviously doesn't have an effect on our cost structure the way it will on others. In our first 5 years, we were more focused in the gambling space because we saw the opportunities there. But in the background, we were always spending time studying these different sectors that you now start to see investments that we're making. So this is not a shift of our company strategy at all. It's just you're starting to just see these new investments being made. There's no place as busy as Las Vegas, and we obviously have great real estate on the strip, but there's many opportunities in the regional market in Las Vegas, the downtown market, there's other states that are opening that we do not own real estate. There's other locations that we do own real estate. So I don't know exactly what inning it is, but I'd tell you, we still see incredible amount of opportunity to grow our business in owning casino real estate.”

OptionsHawk Executive Summary & Focus Stocks

VICI (VICI) is the top name in this group and executing very well but **Host (HST)** screens as the best value buy at just 10.2X FFO with estimates moving upwards and a strong growth recovery seen ahead. The small caps in this group are all trading cheap with indications of a strong growth recovery ahead. **EPR Properties (EPR)** screens attractive in the small cap names with a potential box office recovery in 2023 and trading just 8.7X FFO. **Sunstone (SHO)** a Hotel REIT that screens attractive and is seeing upward revisions.

REITS – Office

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute, Kastle Systems Card Swipe Data, Google Mobility Data

Components: ARE, BXP, KRC, CUZ, DEI, HIW, EQC, OFC, SLG, HPP, DEA, PGRE, PDM, ESRT, BDN, OPI

International & Private Peers: Segro PLC, DIC Asset, Gecina SA, Covivio, Dexus, British Land

Intro

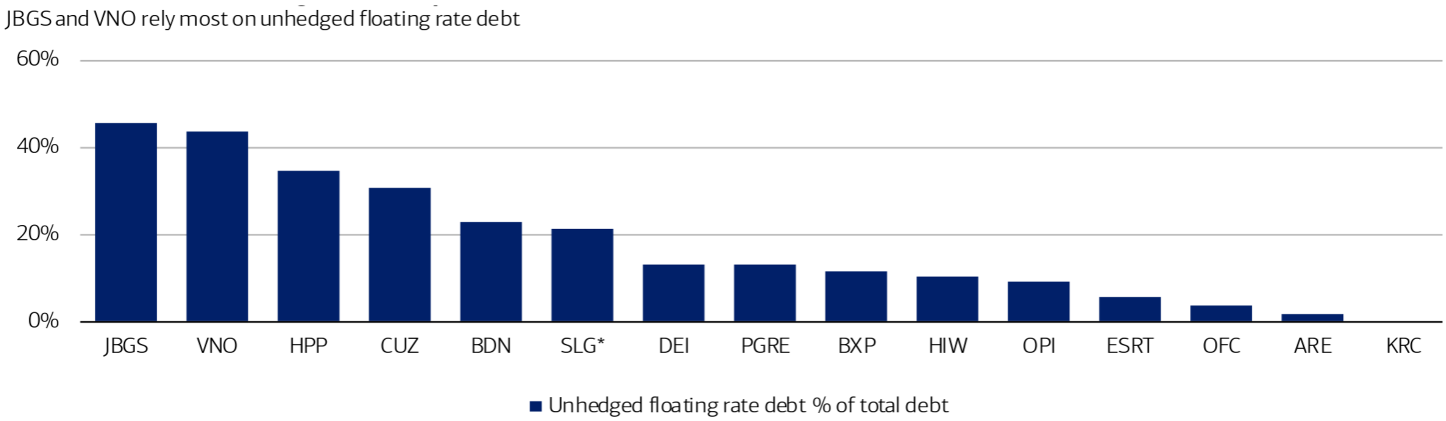
The combination of higher interest cost and large lease expirations leads to a year of transition in 2023 for these names. Returning to the office is likely to never return to historical norms. In the latest quarter many beats resulted from lower quality income such as lease termination fees, land sales gains or timing of operating expense savings likely to reverse in 2H22 rather than a stronger core outlook. The outlook remains cautious with tenant demand headwinds, high capex and weaker balance sheets. Core NOI and interest expense are trending worse than expected across the group. REITs with the highest quality assets, strongest balance sheets and development platforms are best positioned. REITs are moving quickly to hedge floating rate exposure.

Industry Backdrop & Investment Considerations

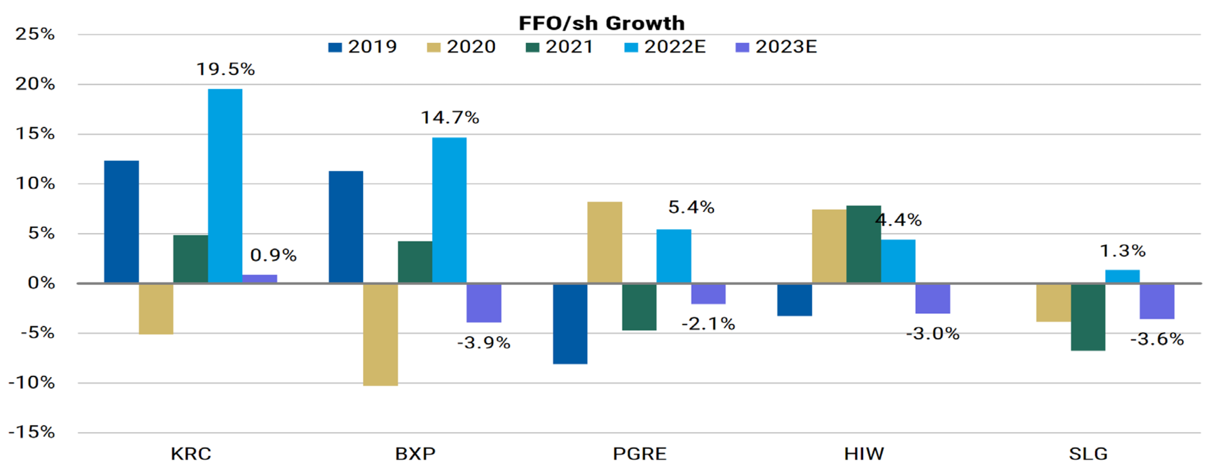
A large driver of future earnings growth for office REITs is development activity. The earnings accretion is heavily impacted by the size of pipelines relative to the size of each company's earnings base. The primary demand driver for Office REITs is office employment growth. A prominent topic has been the potential implications of changing workspace designs/systems for companies' office space needs.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA. Balance sheets and financing strategies are important determinants of earnings for Office REITs, particularly for those with significant development pipelines.



Valuation & Comps



Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Office								
ARE	Alexandria Real Estate Equities Inc	24.6B	17.83X	7.30%	9.05X	3.14%	6.00X	0.29%
BXP	Boston Properties, Inc.	10.6B	9.01X	3.72%	3.98X	5.82%	7.21X	0.70%
KRC	Kilroy Realty Corp	4.6B	8.56X	9.63%	7.55X	5.33%	5.73X	2.88%
CUZ	Cousins Properties Inc	3.8B	9.29X	-1.54%	7.16X		4.58X	-0.91%
HIW	Highwoods Properties Inc	3.0B	7.14X	0.34%	5.72X	7.01%	5.22X	2.21%
OFC	Corporate Office Properties Trust	2.9B	10.85X	2.59%	5.16X	4.33%	6.41X	0.43%
EQC	Equity Commonwealth	2.8B	78.45X					-3400.00%
DEI	Douglas Emmett Inc	2.8B	7.83X	3.82%	3.88X	6.69%	8.08X	-0.88%
SLG	SL Green Realty Corp	2.3B	5.42X	-8.90%	4.76X	10.90%	10.81X	-1.91%
HPP	Hudson Pacific Properties Inc	1.5B	5.08X	-2.31%	4.02X	9.16%	7.47X	-0.54%
DEA	Easterly Government Properties Ir	1.4B	11.71X	-5.90%	4.23X	7.08%	6.64X	-5.22%
PGRE	Paramount Group Inc	1.3B	6.25X	2.80%	2.83X	4.98%	8.32X	1.57%
PDM	Piedmont Office Realty Trust, Inc.	1.1B	4.64X	-0.51%	4.82X		7.05X	-1.48%
ESRT	Empire State Realty Trust Inc	1.1B	8.06X	-5.83%	3.06X	2.05%	6.06X	9.82%
BDN	Brandywine Realty Trust	1.1B	4.61X	-4.40%	4.15X		6.65X	-2.07%
OPI	Office Properties Income Trust	0.7B	3.04X	-20.34%	2.53X	15.32%	8.19X	0.64%

Management Commentary

Alexandria (ARE) on life sciences demand….. "And I think the overwriting macro observation would be the long-term health care needs of this country certainly aren't going away. Innovation in medicine is really a national imperative and just look at the mental health problem across this country as one simple example. And as I've said many times before, there are about 10,000 known diseases to human kind. And really that we've only addressed as a society about 10% with addressable therapies and very few real cures. Biotech, I think, remains resilient. We have a level of knowledge and understanding of the true life science real estate demand that just isn't out there if you hang for lease sign and hire a broker. Alexandria continues to experience strong leasing spreads and rental rate increases. I think it's important to note Alexandria out of 127 REITs as of June 30, has the second best debt maturity profile of all of them, and that's pretty amazing.

Boston Properties (BXP) on the Premier Workplace Market…. "Given that 94% of BXP CBD space competes in the premier workplace market, we believe it's increasingly necessary to understand operating trends for the premier workplace segment of the market to assess and forecast our leasing performance. In terms of real estate capital markets, transaction volume for office assets slowed to $18 billion in the third quarter, down 11% from the second quarter and down 41% from the third quarter last year. We expect transaction volumes to decline further, particularly in the next few quarters. Debt financing is increasingly expensive and difficult to arrange and many institutional buyers that withdrawn from the market due to real estate over allocations caused by the denominator effect and/or a view that more attractive entry points for new investments will be forthcoming in future quarters."

OptionsHawk Executive Summary & Focus Stocks

Office REITs are certainly not a preferred area to be allocating longs and **Alexandria (ARE)** is our annual best-in-class name, but **Kilroy (KRC)** looks cheap at 8.55X FFO with rising estimates as a small cap. None of the other small caps look attractive and can likely find more shorts than longs. **Boston Properties (BXP)** is the other large cap seeing stable growth and is diversifying its properties trading fairly cheap at 9X.

REITS – Shopping Center & Malls

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute

Components: O, SPG, KIM, REG, STOR, FRT, NNN, BRX, ADC, SRC, KRG, PECO, EPRT, SITC, MAC, FCPT, ROIC, SKT, UE, GTY, AKR

International & Private Peers: KlePierre, Unibail Rodamco, Scentre Group

Intro

Overall, retail REITs have reported stronger than expected fundamentals with positive leasing momentum heading into 2023. Store openings remain at an all-time high outpacing store closings by >180%. Store closings YTD reported only 1,715 compared to 3,382 at this time last year and 11,306 for record high for the full year of 2020. Retailers are focusing on omnichannel efforts to improve profits vs. just sales which is clearly benefiting landlords. While openings continue to skew towards open-air shopping centers, malls have also reported strong leasing volume YTD. Retail REITs with higher exposure to high income demographics and greater exposure to grocery anchored center can outperform and be more resilient to cyclical downturns. SPG leasing and economics continues to outperform post pandemic but remains underappreciated. Management is confident in positive comparable NOI growth next year and returning to pre-COVID occupancy. REITs argue that occupancy can hit or exceed all-time highs over the next 12-18 months.

Industry Backdrop & Investment Considerations

Malls REIT revenues are related to consumer spending, but not tied to directly. Retailers typically base their ability to pay rent increases on the cost of occupancy relative to retail sales. If sales have not significantly grown over the term of the lease, then rents will not aggressively grow or could even decline. A weakened consumer can affect REITs through increased vacancy from tenant bankruptcies or reduced store openings and less robust leasing spreads on new leases and renewal leases. One misperception is that mall revenues are made up of percentage rent (rent paid by a tenant if the tenant achieves sales above a pre-determined level). In fact, very little of REIT revenue is tied to sales, less than 3% on average, and the majority of revenue comes from fixed, annualized base rents.

Neighborhood Centers and Power Centers are providing the strongest results outpacing Strip Centers and Community Centers.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA. FCF has been a primary valuation metric for retail real estate REITs.

Valuation & Comps

Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Shopping & Malls								
SPG	Simon Property Group Inc	40.7B	10.15X	0.46%	4.62X	5.81%	6.76X	-0.26%
O	Realty Income Corp	40.6B	16.16X	10.03%		4.59%	6.23X	-0.50%
KIM	Kimco Realty Corp	13.5B	13.77X	5.63%	4.02X	3.89%	6.27X	3.92%
REG	Regency Centers Corp	11.2B	16.34X	1.91%	5.20X	3.84%	4.75X	3.34%
STOR	Store Capital Corp	9.0B	14.32X	12.82%		4.95%	5.97X	3.24%
FRT	Federal Realty Investment Trust	8.7B	17.08X	5.11%	5.28X	4.00%	5.57X	4.83%
NNN	National Retail Properties, Inc.	8.3B	14.84X	5.74%	4.75X	4.67%	4.99X	1.62%
BRX	Brixmor Property Group Inc	6.8B	11.54X	4.94%	3.84X	4.30%	6.44X	1.29%
ADC	Agree Realty Corporation	6.3B	18.54X	6.50%	5.11X	3.93%	5.56X	-1.03%
SRC	Spirit Realty Capital Inc	5.8B	11.66X	5.64%		6.22%	5.35X	0.28%
KRG	Kite Realty Group Trust	4.8B	11.55X	10.15%	4.58X	3.75%	7.56X	6.30%
PECO	Phillips Edison & Co Inc	6.9B	14.67X	2.26%	4.53X	3.27%	6.04X	1.59%
EPRT	Essential Properties Realty Trust Ir	3.3B	14.81X	7.35%	6.06X	4.60%	4.65X	-1.26%
SITC	Site Centers Corp	2.9B	11.52X	-1.29%	4.16X	3.91%	5.51X	2.18%
MAC	Macerich Co	2.7B	6.34X	-7.18%		4.96%	7.21X	-0.76%
FCPT	Four Corners Property Trust Inc	2.3B	16.50X	3.84%	4.67X	4.98%	5.31X	0.00%
SKT	Tanger Factory Outlet Centers Inc.	1.9B	10.26X	1.55%	4.20X	4.30%	6.12X	3.13%
ROIC	Retail Opportunity Investments Cc	2.0B	14.27X	2.00%	3.22X	3.58%	7.25X	2.33%
UE	Urban Edge Properties	1.8B	12.82X	2.94%	3.35X	4.24%	7.04X	-0.84%
GTY	Getty Realty Corp.	1.6B	15.68X	5.27%	4.94X	4.95%	4.34X	7.58%
AKR	Acadia Realty Trust	1.4B	11.42X	4.66%	2.26X	4.91%	11.35X	2.63%

Management Commentary

Simon Property (SPG) on retailer sales momentum,

"Reported retail sales momentum continued. Our shopper remains resilient. We reported another record in the third quarter of $749 per square foot for the malls and outlets, which was an increase of 14% year-over-year. Mills ended up at $677 per square foot, a 15% increase. TRG was $1,080 per foot, a 25% increase. Our occupancy cost is at 12%, which is a level not seen since early 2015. Many have tried to kill off physical retail real estate and in particular, in closed malls, and I need not remind you, when physical retail was closed in COVID, all the naysayers saying that physical retail was gone forever. However, brick and mortar is strong -- the brick-and-mortar retailer is strong and e-commerce is flatlining. And importantly, over this period of time, we have paid out $39 billion in dividends to shareholders as we have become stronger and more profitable. And why do I bring this up constantly? Well, because hopefully, this will put in into the so-called negative mall narrative, as you can't pay those dividends without a strong underlying business."

Federal Realty (FRT) on demographics importance and how it handles cyclicality…."Demographics matter, especially in times of economic uncertainty. Past cycles have convinced us that families simply have to have money to spend for retail real estate cash flow to grow. 68,000 households with annual average household incomes of $150,000 sit within 3 miles of Federal Realty Centers. That's $10.2 billion of family income generated within a 3-mile radius, and more than half of those people have a 4-year college degree or better. I know of no other significantly sized retail portfolio that can say that. While sure to pressure everybody's earnings to some extent in the years ahead, how much so and for how long remains to be seen. So the real question is, will property level operating income more than compensate? These are the times when well-leased, well-located dominant retail and mixed-use centers in supply-constrained affluent, densely populated markets and submarkets shine. We're in a cyclical business, no news to anyone. And it's why our business plan has always included multiple ways to counter the rise in money costs and the effects of inflation. The combination of best-in-class shopping centers along with acquisition and development property level income contributions financed with money from an earlier time, along with the potential sale of certain assets, including discrete residential buildings within our portfolio, gives us more flexibility and more tools with which to handle cyclical pressures than most."

OptionsHawk Executive Summary & Focus Stocks

Store (STOR) screens the best in this group but was just acquired by Private Equity so looking across the other $8B+ market cap names **Kimco (KIM)** looks cheap at < 14X FFO with positive revisions to FFO but closely comparable to **Federal Realty (FRT)** as another quality name but trades 17X. Looking across the smaller market cap companies, **Kite Realty (KRG)** is a clear standout at 11.5X FFO with double digit FFO growth seen and the highest positive revisions.

REITS – Self Storage

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute

Components: CUBE, EXR, LSI, PSA, NSA

International & Private Peers

Intro

Management teams are uniformly bullish on the strength of the consumer and the tenant base. They have not seen abnormal behavior from customers despite elevated existing rent increases. Storage REITs' valuation may be tested if existing tenant pricing slows following moderation of new tenant pricing. The sector now trades at 17x multiple or 13% premium to the REIT group vs a 5yr historical average of +6%. Floating rate debt exposure, specifically at EXR/NSA, may be a modest headwind to 2H22 and 2023 FFO estimates.

Industry Backdrop & Investment Considerations

The industry is fragmented, with the top six largest owners (CUBE, EXR, NSA, PSA, LSI, and U-Haul) owning about 16% of the self-storage industry's facilities. Self-Storage Almanac, an independent research firm, estimates the total number of self-storage facilities in the United States to be over 41,000 (and other estimates range 50,000- 60,000).

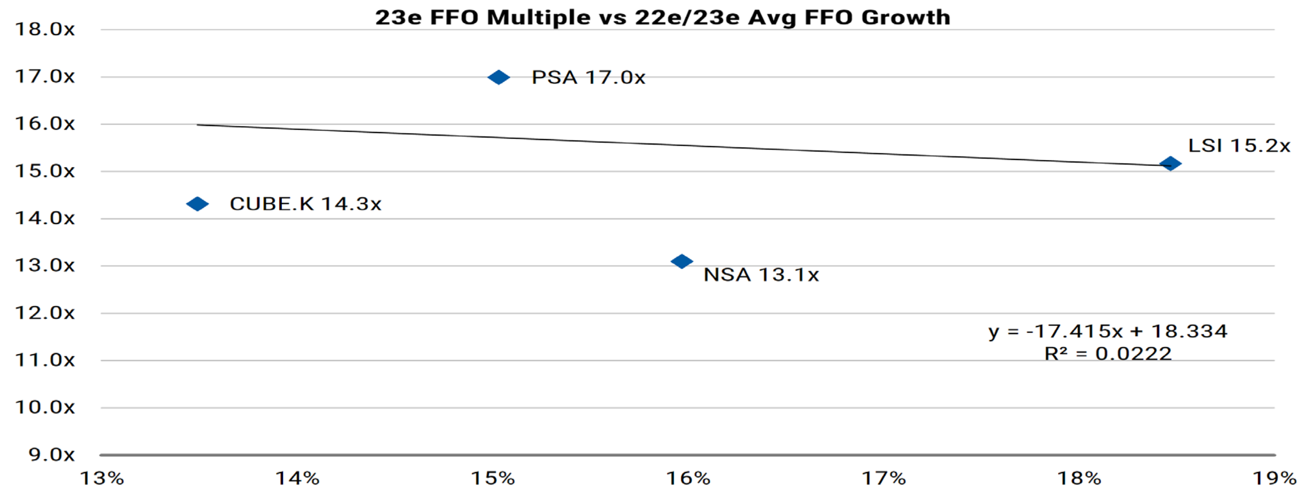
Demand for storage is resilient through good times and bad and sometimes driven by diverse life changes including death, divorce and dislocation. Moderately increasing lengths of stay corroborate the stickiness of the storage customer. Peak leasing season typically starts in late April/early May and extends through late August/early September. Self-storage renters fall into four key categories: residential/retail, commercial, student and military. Despite current elevated new supply, zoning restrictions are generally making the construction of new storage facilities more difficult with local governments hesitant to allow new development given limited job and tax creation.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA. In this group the same store growth metrics is observed closely.

Valuation and Comps

Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Self Storage								
PSA	Public Storage	52.9B	19.18X	14.12%	26.37X	5.76%	1.95X	1.44%
EXR	Extra Space Storage, Inc.	21.2B	18.88X	13.20%	7.33X		4.76X	1.91%
CUBE	CubeSmart	9.7B	17.28X	13.06%	6.33X	4.02%	5.13X	4.01%
LSI	Life Storage Inc	9.1B	16.61X	17.13%	5.53X	3.90%	4.95X	5.27%
NSA	National Storage Affiliates Trust	3.5B	13.87X	14.08%	5.58X	5.50%	5.99X	-0.78%



Management Commentary

Public Storage (PSA) on self-storage industry…. "Customers are drawn to use self-storage even in an environment where some top line drivers are decelerating, such as home sales and market-to-market migration levels. The appeal and rationale to use storage is still tied to a sensible financial and need-based decision, where the cost of shelter, whether you own or rent, has increased dramatically. In addition, our customer survey data points to needing more space at home, as the second and elevated driver to use storage. Hybrid work environments, for instance, are proving to be sustainable -- to be a sustainable reason for additional need for storage. For our business customers, renting a storage unit is a compelling alternative to taking down more expensive, less flexible industrial space. As demand has remained very good, existing customers, too, are staying longer, giving us the ability to optimize rate increases and occupancy. On a macro basis, new supply of competitive product has been flat to down from peak deliveries in 2019. Nationally, markets have been able to absorb the more subdued pace of new development. Our view is that new development will also be static for the near term, as risk levels tied to development have increased, particularly due to city approval time frames, higher component costs and the dramatic increases in the cost of construction lending."

Extra Space Storage (EXR) on external growth opportunities….. "We continue to be busy on the external growth front, adding 40 stores gross to our third-party management platform, closing over $100 million in bridge loans in closing a number of acquisitions, most notably the purchase of Storage Express. We view Storage Express as a strategic opportunity to acquire not only an attractive portfolio with operational upside but a remote storage platform. We believe this will unlock an additional growth channel for Extra Space to acquire and integrate smaller properties that lend themselves to a remotely managed model."

OptionsHawk Executive Summary & Focus Stocks

The storage REIT group continues to offer solid growth while valuations are a bit stretched. **Life Storage (LSI)** screens as the most attractive play at 16.6X FFO which is below larger peers yet offering better growth and seeing sharper upward revisions for FFO. **National Storage (NSA)** is an attractive small cap particularly compared to the rest of the REIT groups at 13.9X FFO offering solid growth and potentially an M&A target.

REITS – Timber

Resources: Nareit, REITs-Market, REIT Notes, REIT Institute

Components: WY, WFG, RYN, PCH

International & Private Peers

Intro

This group is facing major housing and timber headwinds following a historic surge during the pandemic. Weakness in single-family construction, declining prices and work stoppages all are headwinds to 2023 numbers.

Industry Backdrop & Investment Considerations

Timber REIT performance is tied to the housing market and thus to a strengthening economy. As economic conditions and employment improve, housing starts rise and increase the demand for lumber. An underbuilt housing sector lacking much inventory with improving homeownership economics and an ageing US housing stock provide positive tailwinds.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA.

Management Commentary

Weyerhaeuser (WY) on lumber and OSB markets…. "Starting with the lumber and OSB markets. Benchmark lumber and OSB prices entered the third quarter having stabilized from significant declines earlier in the year as buyers reentered the market to bolster lean inventories. Buyer sentiment improved slightly following a brief decline in mortgage rates and in response to solid June housing starts data. This dynamic continued through most of July, resulting in a steady increase in benchmark pricing for both products. By early August, buyer sentiment once again turned cautious resulting from rapidly rising mortgage rates, housing affordability concerns and in response to unfavorable July housing starts data. Buyers remain cautious through the end of the quarter, largely limiting orders to necessity purchases. While OSB prices stabilized in September, lumber prices moved gradually lower throughout the end of the quarter."

West Fraser (WFG) on demand trends…. "Repair and renovation and industrial markets are now much larger contributors to North American industry demand for OSB. Demand from these 2 end markets has increased substantially over the last 20 years, growing from just 22% to approximately 33% of total OSB demand over that period. What this data tells us, industry data tells us is that while new home construction will continue to be a key driver of wood building products demand in North America, repair and renovation and industrial markets have become more significant drivers of overall demand for our products. Further, the repair and renovation industrial end markets historically tend to have significantly less demand variability through the cycle than that of new home construction. We believe that this is an important to note as it shows we are better positioned today to weather future cycles in the U.S. housing market."

OptionsHawk Executive Summary & Focus Stocks

There is not a lot to say on this group with very few names and a tough outlook for growth considering the housing market, but these names hold important assets and **Weyerhaeuser (WY)** offers a 6.7% dividend yield as the top name in this group.

REITS – Tower & Infrastructure

Components: AMT, CCI, SBAC, UNIT, RADI

International & Private Peers

Intro

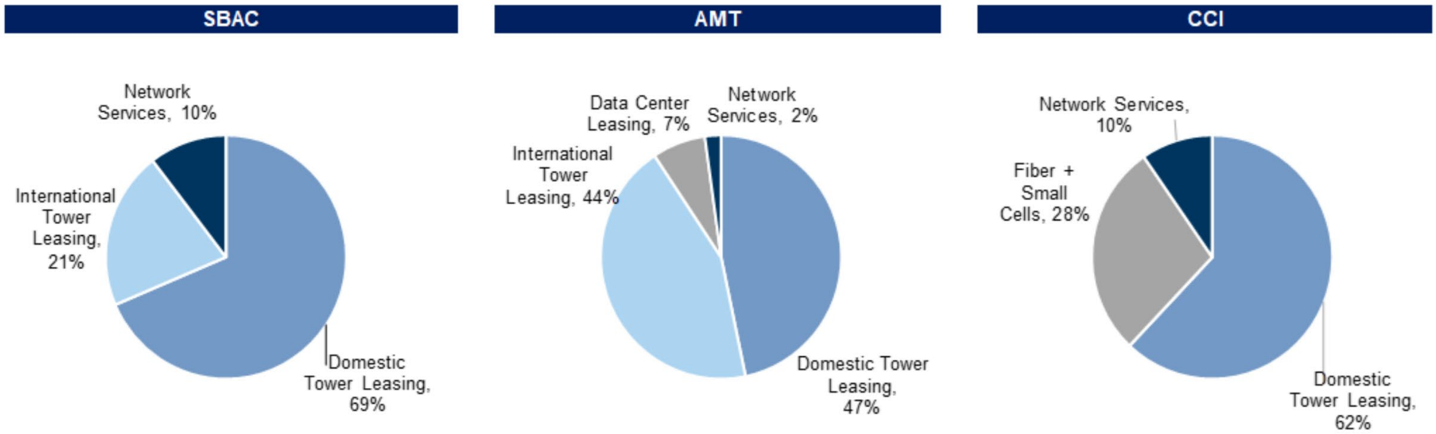
The general tone from Tower and Data Center management teams remained positive around their base businesses and sustained secular tailwinds are expected to drive 2023 performance for most. FX and interest rates will likely be a noticeable headwind for select names. On the rates front, rising interest expense is a headwind for AMT (23% float) followed by CCI (10%) and SBAC (~10%). Higher interest rates, FX and international churn have weighed on tower stocks in 2022. As long duration assets with limited near-term pricing power. Digital Infrastructure companies continued to strike an upbeat tone, with SBAC anticipating that domestic tower leasing activity will accelerate in 2H22 and remain at attractive levels in 1H23. AMT continues to expect a step-up in domestic organic growth next year, based on its long-term domestic organic growth guidance. CCI sees a long runway for growth on its domestic towers, noting that the US is in between the first and second years of a decade long 5G investment cycle and that data traffic is nearly doubling roughly every 2 years in the US. In terms of small cells, CCI remained confident in its ability to deploy 10,000 nodes in 2023 (up from 5,000 in 2022) and noted that it expects millions of small cells will need to be deployed in the US. C-Band spectrum deployments, Dish's network investment and 5G coverage buildouts remain positive tailwinds.

Towers have come under pressure on higher interest rates and persistent inflation. Interest rates also present a moderate amount of earnings risk given floating rate exposure and upcoming maturities. With capex set to fall for T-Mobile and Verizon, DISH remains the biggest wildcard with SBAC most exposed to any meaningful downturn in deployment trends over the course of next year. The 5G leasing cycle is well understood with higher levels of new leasing broadly expected in 2022 but beginning to dissipate by the end of 2023 as carrier capex normalizes. Tower companies have indicated continued leasing demand from DISH as they work towards their June 2023 deadlines, and we will be focused on the company's upcoming Boost Infinite launch as well as any financing activity.

The global tower business model exhibits many of the same characteristics seen in the US and is preferential to unproven small cell investments that, by their nature, include significant exposure to the more cyclical and competitive enterprise fiber business. Meanwhile, the data center business can also be significantly more cyclical and capital intensive with minimal visibility into the edge opportunity. Crown Castle's extensive fiber/small cell investments in recent years and American Tower's recently closed acquisition of CoreSite have put the idea of communications infrastructure convergence into the limelight.

Industry Backdrop & Investment Considerations

The Tower REITS have a long history of outperformance and have seen consolidation remain a major trend while 5G is being eyed as a key opportunity moving forward. The key drivers of the Tower/Fiber industry include data growth, new spectrum, 5G & small cells, edge computing and international expansion.

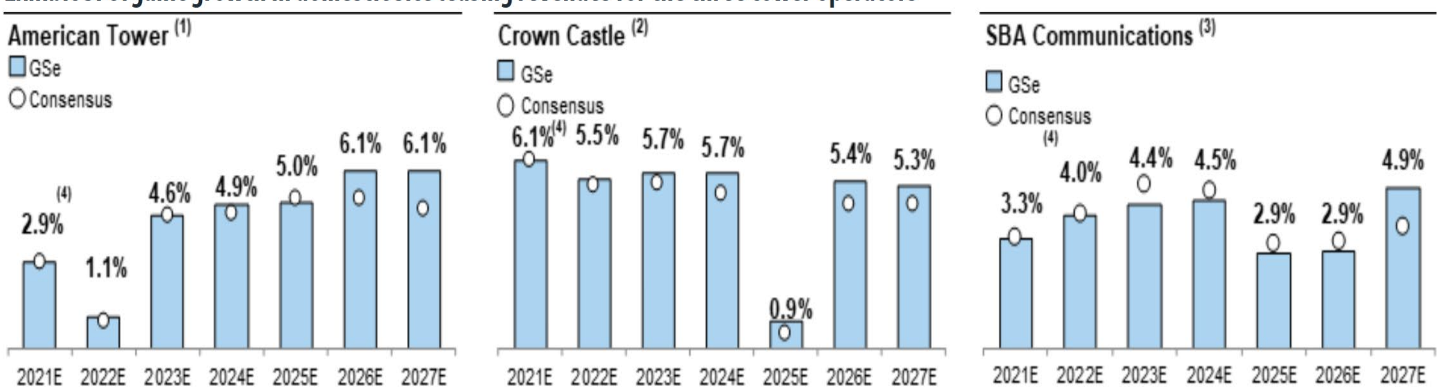


Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA. Billings growth is a key metric for tower stocks.

Valuation & Comps

Exhibit 3: Organic growth in domestic site leasing revenues for the three tower operators



Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Tower & Infrastructure								
AMT	American Tower Corp	100.5B	21.62X	4.37%	6.87X	2.71%	5.75X	-1.18%
CCI	Crown Castle Inc	60.9B	19.12X	4.98%	5.81X	4.25%	5.16X	-0.27%
SBAC	SBA Communications Corporation	31.4B	23.75X	9.30%	3.83X	0.96%	7.08X	2.00%
UNIT	Uniti Group Inc	1.4B	3.48X	11.55%	1.97X	9.87%	5.58X	0.57%
RADI	Radius Global Infrastructure Inc	1.3B	25.44X	-127.62%	0.66X		24.78X	-900.00%

Management Commentary

American Tower (AMT) on 5G cycle…. "Since the start of 2019, 5G spectrum auctions, mainly in the mid band have collectively driven over $155 billion in purchase price proceeds across our served market. These acquisitions of large swaths of new spectrum have kicked off what we believe will be at least a decade-long period of network investments aimed at delivering on the promises of 5G's faster and lower latency applications. We anticipate this will result in $5 billion of incremental annual customer CapEx spend in the United States, on average, as compared to the levels we saw throughout the 4G cycle. Additionally, in the U.S. The visibility we gained through the comprehensive MLAs we put in place with AT&T, T-Mobile, DISH and most recently, Verizon supports our expectation that these investments will drive a near-term acceleration in organic new business growth and a sustained level of elevated tower activity over a multiyear period. As a result, we expect this future capacity phase to support sustained growth in our tower business. At the same time, we expect the applications driving these densification efforts to present new neutral host infrastructure opportunities aimed at minimizing latency and reducing traffic burdens on middle mile network."

Crown Castle (CCI) on the demand environment…. "And as you pointed out, looking into '23, we expect another really good year of activity and growth to continue with very solid growth on the tower side that we're expecting about 5% organic growth on the tower side. And then the first phase of an acceleration on the small cell side of the business, which I'm sure we'll get into in a few minutes. But the overall demand environment is very healthy, very robust. And our expectation is for that to continue for quite some time. And we're seeing the benefit of that, again, across our infrastructure of assets, the 40,000 towers that we have really concentrated in the top markets in the U.S. And then starting to see the benefits as our customers plan for the next phase beyond the initial upgrade cycle where they're deploying a lot of new spectrum that they've gotten control over the last couple of years and really start to plan for the next leg of the investment that will come around densification, which will be critically important for them to add significant capacity to the network. And it ultimately starts with what's happening with consumer demand and mobile data growth. We continue to see that compound at about a 30% clip each year. And that's a significant strain on their networks. And the only way to really respond to that is deploy more spectrum and then deploy more cell sites. And we're in a great position across our tower and small cell business to be able to benefit and help support that level of investment. So we're pretty optimistic about the growth going forward."

OptionsHawk Executive Summary & Focus Stocks

There are essentially just three names to focus on in this group and all trade around 21X FFO with **SBA Communications (SBAC)** once again looking to be the best-in-class name. Lower interest rates and signs of peaking inflation should benefit this group in 2023. There remains some broader concern that the 5G leasing cycle has seen its best days with carrier capex expected to drop meaningfully in the coming years along with a mix shift to fiber and away from towers.

REITS – Data Centers

Components: EQIX, DLR, DBRG, CD, GDS

International & Private Peers

Intro

There is a focus on the sustainability of leasing trends into 2023 and the extent to which data center operators can pass through higher input costs to customers, especially as power hedges get repriced at higher rates. Global and North America internet and wireless network traffic is growing at a healthy rate, which is expected to continue for the foreseeable future. The latest Ericsson data shows global and North America mobile data traffic each growing at 25-30% CAGRs over the next five years. Data Centers benefit from ongoing IT outsourcing to a Hybrid Cloud model. EQIX and DLR reiterated their belief that pricing power will boost 2023 as demand growth continues to outpace supply. EQIX is seeing strength across all of its verticals and geographies as enterprises overhaul their IT infrastructure in the wake of COVID-19. DBRG noted that Vantage, its hyperscale data center platform in Europe, has leased more than 200 MW of power this year (with an expectation to lease an additional >60 MW by the end of the year) and that its leasing pipeline is also up 200% y/y.

Industry Backdrop & Investment Considerations

The Data Center (DC) group is seeing IT infrastructures move off-premises as a key growth driver. Space & Power is driving revenues with Interconnect growing faster in the last few years and around 10% of industry revenues and rising. Hyperscale represents around 30% of the industry and although pricing can be lower the deals are longer-term and larger to secure capacity.

Colocation providers offering space to multiple tenants generate around 1/3 of the revenues of full IaaS players and as DC companies evolve to value-added services, they can increase the TAM significantly. DC companies also have an opportunity in security, a $20B space, and many of the private companies offer firewalls, threat management, disaster recovery and backup services along with load balancing.

Secular drivers, including IT outsourcing, IP traffic growth and cloud adoption are driving demand for data center capacity. Enterprise IT outsourcing is still in its early stages with only 30% of capacity in multi-tenant data centers (MTDC). Bandwidth-intensive applications, such as gaming and video, and the shift in content consumption through over-the-top (OTT) platforms are similarly expected to remain positive contributors to demand for the foreseeable future.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA.

Valuation and Comps

Ticker	Company	Mkt Cap	Price/FFO	FFO Growth (FY1-FY2)	EBITDA Coverage	Dividend Yield	Debt/EBITDA	FFO Est. Change
Data Center								
EQIX	Equinix Inc	63.0B	23.25X	3.82%	9.36X	1.82%	3.65X	0.29%
DLR	Digital Realty Trust Inc	31.1B	16.11X	3.47%	8.21X	4.47%	5.54X	-1.75%
DBRG	DigitalBridge Group Inc	2.0B	33.18X				28.20X	0.00%
CD	Chindata Group Holdings Ltd	2.8B			4.81X		-0.53X	
GDS	GDS Holdings Ltd - ADR	3.6B	8.74X	22.22%	2.24X		4.39X	0.00%

Management Commentary

Equinix (EQIX) on business outlook…. "While we continue to closely monitor macro conditions and adapt our execution accordingly, the fundamentals of our business remain exceptionally strong. Our expansive global reach and robust interconnected ecosystems continue to attract a wide and diverse customer set as they prioritize digital investments and embrace Platform Equinix as a point of nexus to support hybrid and multi-cloud. This wave of digital infrastructure demand and our highly differentiated value proposition are translating to a robust pipeline, a highly favorable pricing environment and low churn, all fueling record performance across the business year-to-date and setting us up for a strong trajectory as we look to 2023 and beyond. Specifically, on power, we have had a keen focus in this area and continue to feel confident in our position. Our approach to multiyear hedging is affording Equinix the visibility and predictability to communicate to customers in advance of expected power price increases and is allowing us to deliver cost points to customers that remain highly favorable against spot rates in many markets as volatility persists. While our aim remains to dampen this volatility for our customers through hedging, we do expect meaningful increases in power costs in many markets. And per our contracts, the full impact of these additional power costs will be passed on to customers. Overall, we believe we remain in a good position relative to competitors and the broader market."

Digital Realty (DLR) on data center activity…. "Looking ahead, sales activity remains healthy as the secular trends driving data center demand remain in place. Enterprises continue their digital transformation with a growing preference for hybrid cloud architecture while cloud and connectivity providers continue to expand their infrastructure to better serve their customers around the world. But the world is changing. We are seeing sales cycle lengthen and global uncertainty extends decision times. Importantly, we are pushing prices higher to reflect tightening supply and rising costs. Admittedly, some of the deals this quarter have been in process for many months and do not fully reflect today's environment."

OptionsHawk Executive Summary & Focus Stocks

We are really only looking at two names in this group and **Equinix (EQIX)** trades at a near 50% premium to **Digital Realty (DLR)** while having similar FFO growth outlooks. EQIX is a high-quality business but tough to pay 23X FFO and compared to other REIT groups, unimpressive growth ahead so avoiding these names overall.

<u>REITS – Specialty</u>

Components: CXW, GEO, IRM, LAMR, OUT, SAFE

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA.

Management Commentary

Iron Mountain (IRM) on consistent growth…. "And how we get that is, is that we have high single-digit growth rates on the organic storage side of the business, but the services have really taken off, and we've seen consistent 20% plus growth on some of the fast areas of growth on the services. And when I say the fast area of growth of the services, that's really speaking about the digital services and in the legacy, if you will, or the part of the ALM business that we've had for quite some time, which is more about the IT asset disposal side of the ALM business. I think the -- our traditional record storage business or the paper document business is a very high margin business, but it's also a very -- it's a strong levels of scale around the world. So that leads to very, very good profitability or very high margins. On some of the newer businesses, they resemble a lot like when we would enter new countries with our records management businesses, as you build scale, you actually increase the margin. I mean the margins are still very healthy. I mean if you compare it to other business services, I think most business services would love to have the strong double-digit EBITDA margins that we enjoy across our business segments. But what we -- what you'll also notice in those new areas is that quarter-by-quarter as we continue sequentially to actually grow the margin on that as we build out scale. So it's very similar as when we were building out our global footprint on records management. As you build scale in those businesses, the margins go up. But already, they all produce very strong return on invested capital. So the ROIC of these business is very high. And a number of them, it takes less capital to actually deploy the storage infrastructure that you need to store their volumes. So that -- so already, we're getting good levels of return on invested capital."

OptionsHawk Executive Summary & Focus Stocks

Again, a very small group of stocks with **Iron Mountain (IRM)** the only name screening remotely healthy and is already trading 19X FFO but a diversifying business and has some self-storage and data center aspects to the business making it fairly attractive.

REITS – Home Financing

Components: NLY, AGNC, CMTG, CIM, RC, TWO, PMT, NYMT, MFA, EFC, RWT, ARR, IVR

Intro

This is a tough industry to be involved with considering the headwinds in housing and a group that rarely offers compelling investment opportunities. Further economic uncertainty coupled with agency MBS spreads widening are likely to remain headwinds. While the investment outlook is improving given higher mortgage rates plus other longer-term positives, downside tail risks persist.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA.

Management Commentary

Annaly (NLY) on the tough backdrop…. "Now beginning with the macro backdrop in what continues to be a historically challenging year, the third quarter brought about a further sell-off in the bond market, and mortgage spreads widened to crisis era levels. Persistently high inflation readings, rapid and sustained Federal Reserve rate hikes, tightening financial conditions, elevated volatility, geopolitical turmoil and rising financial stability risks have weighed heavily on markets. A consequence of volatility has been extremely weak investor demand for fixed income products, particularly for Agency MBS. In fact, the third quarter represents only the third time in the past 10 years in which banks and mutual funds to critical private sector holders of mortgage securities and loans have reduced their Agency MBS holdings simultaneously. Home price appreciation very likely peaked for the cycle and has begun to reverse course in many parts of the country. Given the mortgage affordability shock from high home prices and rapidly rising rates, we now expect the housing market to correct, potentially erasing the entire appreciation seen this year by early to mid-2023. And despite volatility in interest rate and mortgage markets, funding conditions continue to be healthy as Agency MBS repo, Residential Credit and MSR facilities remain readily available. Our financing rates have risen certainly but are commensurate with other benchmark short-term interest rates. And while high volatility could drive an increase in repo haircuts, we have seen limited evidence of this thus far."

OptionsHawk Executive Summary & Focus Stocks

I do not see a great reason for involvement in this group with all of the risks.

REITS – Commercial Financing

Components: STWD, BXMT, ABR, ARI, LADR, KREF, STAR, TRTX

Intro

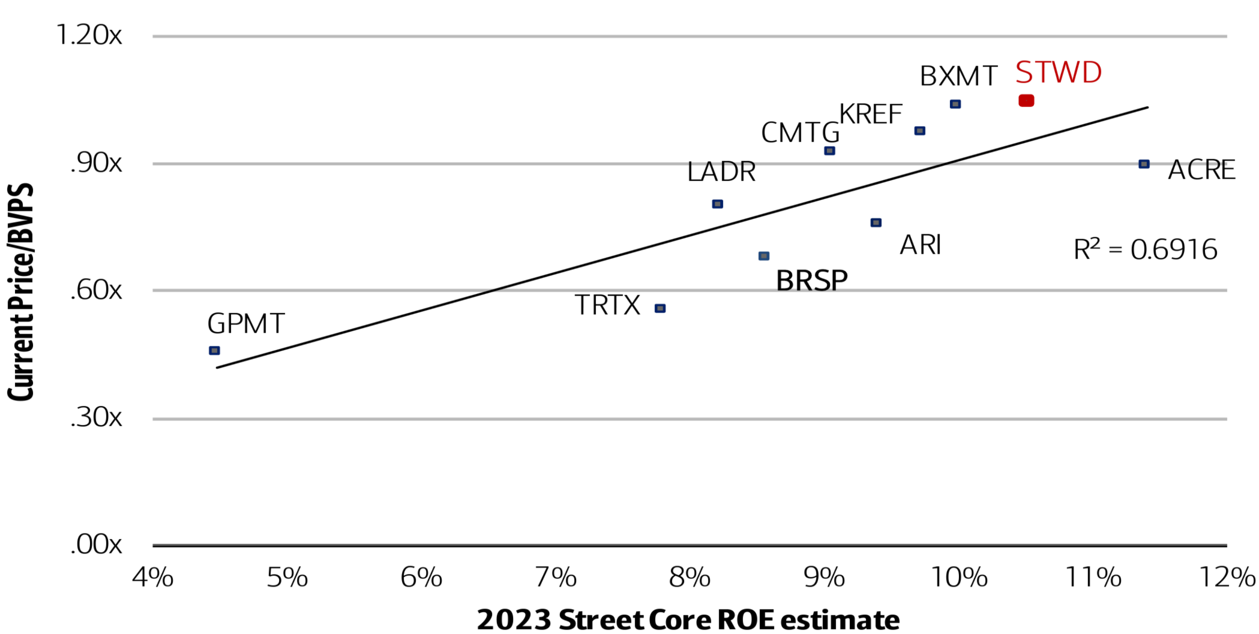
This group is a complex one to analyze but is obviously tied to the real estate cycle and seeing increased volatility in rates and mortgage spreads. Slower commercial real estate loan volume is a headwind along with potential credit issues down the road. STWD's business is positively exposed to rising rates, while its special servicing segment (LNR) provides a natural hedge to credit exposure.

Indicators, Metrics & Stock Selection Framework

In valuing REITs, we use a number of metrics, including: price-to-fund from operations (FFO), a key earnings metric for REITs; price-to-net asset value, which values REITs based on their underlying assets; relative yield analysis, which compares yields across different asset classes; and implied cap rates, to determine where the market is valuing a company or sector. Leverage is also important for comparative purposes using Debt/EBITDA.

Valuation and Comps

mREIT BVPS multiples vs 2023E Consensus Core ROEs



Management Commentary

Starwood Property (STWD) on playing defense and opportunities ahead....."So I would say that the most important thing I would tell you about us is, we're on a defense. We're not really on offense. We have the record liquidity of $1.3 billion. We raised the $600 million debt deal last week -- earlier this week, I guess it was. It was last week, closed this week. And we're going to be very careful where we deploy the capital. It is -- the market opportunity for us is as good as it's been since we IPO-ed the company in 2009. Not only the banks pulling back on credit given the craziness of the Fed, nobody knows what to do. So the banks are not only not lending, but they're reluctant to do anything, frankly. That creates unbelievable opportunities for companies like us. On the other hand, we have a large lending book, and we have to watch our each loan individually. The other hidden gem, which we -- which has really been an amazing business for cycle in, cycle out is our servicer business, which is going to have a real good time if, in fact, there were distress in the market with $100 billion of name servicing, being the largest in the country and in fact, the world. It has enormous earnings potential for us which could drive profits, and it also obviously provides an unusual look into what's going on across the country and in each asset class."

OptionsHawk Executive Summary & Focus Stocks

This again is not my favorite group to get involved with for this backdrop, but **Starwood (STWD)** would be the preferred name because I like the management team.

Healthcare

The Healthcare sector generally is more defensive during times of market volatility and more recession proof than other sectors. Biotech is more of a long-duration group and catalyst driven with pipeline events. In the current rate environment, the companies with commercial products generating cash flows continue to outperform. Meanwhile, M&A remains a key driver for smaller names as the larger ones remain flush with cash and look to generate growth. For the Biotech sections we will mostly look at key catalysts for the larger names in the sub-groups. Much of the industry faces labor challenges while Technology is disrupting a lot of traditional areas with a shift in focus to value-based care.

Company	Deal Capacity through 2023 ($B)	Deal Capacity through 2025 ($B)
Vertex	$50	$58
Merck	$54	$91
Gilead	$44	$63
Incyte	$4	$6
Biogen	$20	$25
Neurocrine	$3.9	$5
Regeneron	$41	$50
Eli Lilly	$27	$37
Bristol-Myers Squibb	$45	$50
Pfizer	$150	$170

Biotech 2023 Catalyst Watch

Company	Catalyst	Upside/ Downside	High Impact	High Risk/Reward	Most Watched	High Conviction	Under the Radar
Amgen	Amgevita (Humira) biosimilar Ph 3 interchangeability data (1Q23)	+5%/-5%					X
AstraZeneca	TROPION-Lung01 data in 2L/3L NSCLC - *readthrough* (1H23)	+5%/-5%	X				
Biogen	Lecanemab PDUFA date (Jan 6, 2023)	+5%/-20%	X		X	X	
Biogen	Lecanemab CMS coverage decision (2023)	+15%/-25%	X	X	X		
Gilead	Additional TIGIT data (likely ASCO) (Jun 2023)	+10%/-10%	X				
Gilead	EVOKE-02 combo data in 1L NSCLC (Mid-2023)	+10%/-5%	X				X
Incyte	QD ruxolitinib approval (March 23, 2023)	+3%/-3%					X
Lilly	TRAILBLAIZER-ALZ2 (mid-2023)	+20%/-16%	X	X	X		
Lilly	Mounjaro Obesity filing and potential approval (mid-2023, onwards)	+10%/-5%	X			X	
Lilly	Novo CagriSema data update in type 2 diabetes (2023)	+7%/-5%					X
Merck	Full readout of Ph 3 STELLAR trial in PAH (2023)	+10%/-5%	X			X	
Mirati	KRAS G12D MRTX1133 in (2H22)	+3%/-2%					X
Neurocrine	CAH data (1H23)	+10%/-15%	X				
Pfizer	RSV vaccine approval/ACIP meeting in older adults (May 2023)	+5%/-5%			X		
Regeneron	8mg aflibercept FDA approval (2023)	+5%/-10%	X	X		X	
Replimune	CERPASS primary analysis (RP1/CSCC) (1H23)	+30%/-25%	X			X	X
Replimune	Additional Ph 2 IGNYTE data for RP1+Opdiv (2023)	+10%/-10%	X		X		
Vertex	Trikafta regulatory decision in age 2-5 (2023)	+5%/-7%	X		X		
Vertex	Exa-cel approval (2H23)	+5%/-10%	X				
Vertex	VX-548 in neuropathic pain Ph 2 interim data (2023)	+15%/-10%	X			X	

Biotech – Cardiovascular, Metabolic, Endocrine, Hematologic & Nephrology

Components: UTHR, CYTK, RXDX, AKRO, DVAX, CINC, KROS, MDGL, RETA, ENTA, INVA, DSGN, VRNA, MCRB, ICPT, ESPR, AMRN, PTGX, PHAT, ALBO, VKTX, CBAY

International & Private Peers

Intro

SMid-Cap biopharma is an idiosyncratic industry where fundamental stock performance is tied predominantly to pipeline catalysts, new product cycles, and M&A. UTHR is a profitable mid-cap biopharma company focused primarily on developing and commercializing drugs for pulmonary arterial hypertension (PAH), including various formulations of treprostinil - Remodulin (IV/SQ), Tyvaso (inhaled), and Orenitram (oral). For AKRO, Ph2b SYMMETRY (F4) data expected in 2H23. For CYTK, investors remain acutely focused on SEQUOIA-HCM, for which topline results are expected in 2H23 and could result in another significant inflection in CYTK share price with positive data. Earlier, in 1H23, non-obstructive HCM data from Cohort 4 of REDWOOD-HCM are expected. CINC is currently expected to initiate a Phase 3 study for bax in rHTN in 1H23 following positive results from the Phase 2 BrigHtn study. Bax is also in the Phase 2 figHtn-CKD study for uHTN with CKD with top-line data guided for 2H23. Finally, bax is in the Phase 2 Spark-PA study for PA, with top-line data guided for 2H23.

Industry Backdrop & Investment Considerations

Key themes that drive the overall Biotech section include: the regulatory environment, drug pricing, fund flows, therapeutic crowding, consensus revenue trends, mutual fund positioning, and short interest.

Indicators, Metrics & Stock Selection Framework

Regardless of the macro environment, innovation-driven companies with proprietary scientific capabilities aimed at developing potential first-in-class and/or best-in-class medicines for significant and un-deferrable unmet needs – will outperform over time.

Key value drivers in Biotech include R&D Innovation, Catalysts, the Regulatory Regime, and Product Launches. There are a lot of extra considerations within Biotech investing, such as cash-burn for pre-clinical small caps to ensure companies are positioned to survive the long period without revenues.

Biotech is unlike any other investing as pre-clinical names carry a lot of event-risk and it is difficult to make a confident investment without having a medical background. One of the better investment approaches is early-stage commercial launches. A lot of the value of a Biotech company is within its pipeline so traditional metrics often do not provide major insight. M&A potential is a key contributor to the valuation framework as well considering the large cash firepower held by large cap Pharma/Biotech and the willingness to deploy to improve their respective pipelines and growth profiles. Biotech requires more in-depth research than any other industry for investing though utilizing options flow and price action can typically be a strong work-around to identifying the most valuable plays in the space. Product cycle and pipeline optionality are key drivers.

Valuation and Comps

Ticker	Company	Mkt Cap	P/E FY1	Revenue CAGR (FY1-FY3)	EV / FY2 Sales	EBIT Margin	R&D % Sales	Cash ($M)
Cardio/Endocrine								
UTHR	United Therapeutics Corporation	12.8B	16.48X	10.56%	4.94X	60.91%	12.81%	$ 966.8
RXDX	Prometheus Biosciences Inc	5.0B	-30.85X	-37.78%	2165.56X	-3965.19%	3004.03%	$ 78.4
CYTK	Cytokinetics, Inc.	3.6B	-9.41X	17.36%	57.43X	-4311.77%	2494.39%	$ 106.2
AKRO	Akero Therapeutics Inc	2.0B	-13.45X					$ 374.0
DVAX	Dynavax Technologies Corp	1.4B	6.22X	-30.54%	3.51X	36.60%	7.73%	$ 198.6
RETA	Reata Pharmaceuticals Inc	1.3B	-4.25X	564.27%	33.15X	-13053.15%	8052.78%	$ 31.9
KROS	Keros Therapeutics Inc	1.3B	-11.32X					$ 239.4
MDGL	Madrigal Pharmaceuticals Inc	1.1B	-3.85X		21.99X			$ 59.3
VRNA	Verona Pharma PLC - ADR	1.0B	-11.99X		35.05X			$ 231.7
INVA	Innoviva Inc	0.9B	3.51X	-11.85%	4.29X	425.86%	17.43%	$ 300.8
ENTA	Enanta Pharmaceuticals Inc	0.9B	-6.73X	93.53%	2.93X	-133.13%	171.27%	$ 44.0
MCRB	Seres Therapeutics Inc	0.8B	-2.86X	313.17%	4.11X	-1716.23%	1251.92%	$ 205.4
ICPT	Intercept Pharmaceuticals Inc	0.6B	2.73X	12.51%	1.36X	-13.07%	56.75%	$ 113.2
CINC	CinCor Pharma Inc	0.5B	-5.70X					$ 292.6
DSGN	Design Therapeutics Inc	0.5B	-7.39X					$ 42.5
AMRN	Amarin Corporation plc (ADR)	0.5B	-4.47X	-1.95%	0.52X	-5.72%	6.41%	$ 240.5
ALBO	Albireo Pharma Inc	0.4B	-2.68X	89.89%	4.39X	-352.49%	237.10%	$ 222.5
PHAT	Phathom Pharmaceuticals Inc	0.4B	-2.00X		11.62X			$ 196.8
ESPR	Esperion Therapeutics Inc	0.4B	-1.48X	170.41%	2.83X	-219.30%	153.55%	$ 159.4
PTGX	Protagonist Therapeutics Inc	0.4B	-3.08X	32.31%	13.41X			$ 152.8
CBAY	CymaBay Therapeutics Inc	0.3B	-3.42X					$ 30.7
VKTX	Viking Therapeutics Inc	0.3B	-4.04X					$ 29.4

Management Commentary

United Therapeutics (UTHR) on the Remodulin business…. "So when you look at the Remodulin business, although it's approved as a drug, really key to that product is delivery. And so you have to have a pump to deliver at either subcu or IV. And although it's not a combination product, it acts like one in that you have to have a pump. And note that pump has to be approved to administer Remodulin. Now we know in 2015, the primary pump supplier to the Remodulin market took their pump off the market. And we bought a supply of those pumps to carry us for years. And the inventory of those pumps has diminished. And now we're relying on refurbishment of existing pumps and those get reissued. Now in parallel, while that was happening, we were developing our own subcu pump with -- in a partnership with DEKA Corporation in New Hampshire. And that, of course, has been launched as Remunity. And that's now available in 2 versions: a pharma build version, which has been on the market for about a year now; and in September, we launched a patient filled version. Now that's exclusive to our Remodulin. So any entrant into the generic market has to have a way to deliver the product to the patient. They can't just show up with the drug. So it will be a challenge with subcu pumps simply because availability of subcu pumps is limited.”

OptionsHawk Executive Summary & Focus Stocks

United Therapeutic (UTHR) is the only real profitable name in this group and continues to look cheap at 16.5X Earnings with a solid double-digit revenue growth outlook. With smaller Biotech names we are basically betting on positive data and/or M&A. **Prometheus (RXDX)** just reported outstanding data that makes it an M&A target. **Akero (AKRO)** fits the mold as a catalyst play and has potential to be a big winner in the NASH space. **Verona (VRNA)** a speculative favorite with potential across several respiratory diseases with a new class of treatment. **Keros (KROS)** in another interesting play in anemia and hypertension trading just 4X cash. **Phathom (PHAT)** at 2X cash a very speculative name but a likely approval on 1-11-23 starts a commercial cycle and Phase 3 topline NERD data in Q1 could be a major upside driver. **Cytokinetics (CYTK)** a wildcard into data but has seen a large bull position for upside and likely a M&A target if data comes out positive.

Biotech – Gene Precision Therapy

Components: SRPT, CRSP, NTLA, PTCT, BPMC, RLAY, KRYS, RCKT, RGNX, QURE, EDIT, SGMO, RPTX, CRBU, BLUE, WVE, MGTX, PGEN, DTIL, VYGR

Intro

In Smid-cap Biotech management teams are thinking more strategically about cash burn in a rising rate environment where the increasingly unfavorable cost of capital is forcing an emphasis on cost-cutting(including an active re-prioritization of key clinical programs over earlier stage development programs to extend the cash runway to at least months) and non-dilutive financing options (potential partnerships or royalty streams over costly debt or dilutive equity raises at depressed valuations).

SRPT the largest name in this group with investor focus is on the likelihood of accelerated approval for gene therapy SRP-9001 (potential FDA AdCom in 2Q23+; May 2023 PDUFA per priority review) in Duchenne muscular dystrophy (DMD), in the context of the 2H23 readout of confirmatory Ph3 EMBARK and its probability of success. RLAY plans to disclose first clinical data in 1H23 from the Ph1 study (n~190) of selective and pan-mutant PI3Kα inhibitor RLY-2608, where we will be focused on signals of hyperglycemia and glucose homeostasis to elucidate the selectivity profile. NTLA's platform has already demonstrated the ability to turn off a gene via the Ph1 proof-of concept data for NTLA-2001 or TTR amyloidosis (~$6B opportunity) and NTLA-2002 for HAE, and we await initial data from NTLA-3001 (for alpha-1 antitrypsin deficiency, AATD) to de-risk the other end of the spectrum for the platform, which could open up a broader opportunity set. BPMC recently held an Investor Day focusing on 1) expanding the Ayvakit label into non-ASM (sNDA filing 4Q22), 2) advancing the mutant EGFR program in NSCLC (prioritize BLU-945 + osimertinib in 1L; de-prioritize BLU-701 in favor of BLU-525) and 3) leveraging the early-stage pipeline (BLU-222, 5 early protein degraders and new wt-KIT program). For PTCT, results from the Ph 3 APHENITY study assessing sepiapterin in PKU are still expected by YE22, data from the Ph 2/3 MIT-E study of vatiquinone in mitochondrial-disease related seizures is on track for 1Q23, and MOVA-FA Ph 3 results evaluating vatiquinone in Friedreich ataxia are anticipated in 2Q23.

Industry Backdrop & Investment Considerations

According to the World Health Organization, there are between 5,000 and 8,000 rare diseases and the majority of them have a genetic origin. There are 400m people worldwide, 30m in Europe, and 25m in the United States who are affected by a rare disease. Since rare diseases are often difficult to diagnose, it can take years to obtain an accurate diagnosis. Even after a proper diagnosis, only a few hundred have any treatment. Most rare diseases put substantial medical and financial burdens on patients and their families because they are serious, chronic, and even life threatening.

Indicators, Metrics & Stock Selection Framework

Regardless of the macro environment, innovation-driven companies with proprietary scientific capabilities aimed at developing potential first-in-class and/or best-in-class medicines for significant and un-deferrable unmet needs – will outperform over time.

Key value drivers in Biotech include R&D Innovation, Catalysts, the Regulatory Regime, and Product Launches. There are a lot of extra considerations within Biotech investing, such as cash-burn for pre-clinical small caps to ensure companies are positioned to survive the long period without revenues.

Biotech is unlike any other investing as pre-clinical names carry a lot of event-risk and it is difficult to make a confident investment without having a medical background. One of the better investment approaches is early-stage commercial launches. A lot of the value of a Biotech company is within its pipeline so traditional metrics often do not provide major insight. M&A potential is a key contributor to the valuation framework as well considering the large cash firepower held by large cap Pharma/Biotech and the willingness to deploy to improve their respective pipelines and growth profiles. Biotech requires more in-depth research than any other industry for investing though utilizing options flow and price action can typically be a strong work-around to identifying the most valuable plays in the space. Product cycle and pipeline optionality are key drivers.

Management Commentary

Sarepta (SRPT) on the path forward…. "So let's move now to our gene therapy platform and specifically to SRP-9001, our gene therapy for Duchenne muscular dystrophy. 2022 has been a momentous one for SRP-9001 and for the Duchenne community that we serve. Over the course of the first half of 2022, we discussed with the FDA the possibility of submitting a biologics license application or BLA for the approval of SRP-9001 on an accelerated basis. As a result of those discussions and the written feedback that we received, we announced on our second quarter call that we intended to submit a BLA for the approval of SRP-9001 to treat ambulatory Duchenne patients. And in the third quarter, we did indeed submit our BLA for SRP-9001. Now if all goes to plan, the FDA will accept the BLA for filing at the end of November of this year. We anticipate a PDUFA date on our BLA in May of 2023 and if successful, a launch by the middle of 2023. To those who have asked why we are trying to move so urgently, let me talk for just a moment about why seeking accelerated approval here is not merely appropriate but is compelled by good science and ethics. And the FDA itself has repeatedly noted the opportunity for accelerated approval in gene therapies where appropriate. And from our perspective, SRP-9001 is an ideal candidate for accelerated approval review. So planning for the success of our BLA, we are ramping up manufacturing. We have bolstered our commercial, medical affairs, patient services and access teams, and we are focused on site and launch readiness."

Blueprint (BPMC) on its achievements and growth ahead…. "We have nominated 14 therapeutic development candidates, 2 of those have gone on to become approved medicines, 8, are currently in development, either by our team at Blueprint or in partnership and collaboration. And 4, we have stopped for various technical or shifting market opportunity reasons. We have defied industry odds with an 80% success rate from IND to clinical proof of concept. We have taken on serious medical conditions, and we have developed important data that has led to 5 breakthrough therapy designations. And we have moved with urgency, getting FDA approval in less than 4 years from enrolling our first patient in the AYVAKIT and GAVRETO clinical trials. We know that the one thing patients with advanced cancer and rare diseases do not have is time. We have made history by bringing 2 innovative medicines to approval from our labs in the first 10 years since our founding. And we have expanded the reach of these medicines through 5 separate FDA approvals. We are well-positioned for near-term commercial growth based on 3 key distinguishing factors. The first is that the opportunities we are pursuing are large. We are ready to scale the impact of AYVAKIT by addressing the medical needs of a substantially larger portion of patients with SM with our potential label expansion into non-advanced SM in the middle of next year. The market opportunity for AYVAKIT across the spectrum of SM is at least 15-fold the opportunity we are pursuing today. This is a blockbuster opportunity. And importantly, it is also a specialty market. We can access this much larger opportunity through economies of scale with only a modest increase in our field-based teams. At the same time, we are growing our geographic footprint and expanding our customer base to regions beyond the United States. We are launching directly with our own team in Europe, and we are working with partners to bring our innovative medicines to patients around the globe."

OptionsHawk Executive Summary & Focus Stocks

Sarepta (SRPT) is the only large cap here and has an active year ahead of catalysts, which makes it a tough set-up having run up already but a potential major growth name moving forward and trades around 8.3X FY2 expected sales. In the $2B to $4B market cap group **Blueprint (BPMC)** a potential M&A target with the focus on its commercial launch success. Among the very small names **UniQure (QURE)** is now trading < 3X cash and a recent FDA approval sets up for up to $800M peak sales while having a current market cap of $1.1B. **Rocket (RCKT)** could make a nice acquisition target in the gene therapy space with its late-stage pipeline and regulatory filings in the EU and US in 2023.

Biotech – Oncology

Components: GMAB, SGEN, ARGX, BGNE, INCY, LEGN, HALO, EXEL, MRTX, ROIV, ARVN, IMCR, IBRX, RCUS, FATE, RVMD, CLDX, DAWN, SWTX, AGIO, IOVA, ALLO, LYEL, ZNTL, IMGN, INBX, DCPH, KURA, VERU, ACLX, IGMS, TGTX, BCYC, AGEN, SRNE, MRSN, MOR, NKTX, NRIX, IMGO, PMVP, ALXO, GTHX, HRTX, CCCC, KPTI, YMAB, ZYME, KNTE, STRO, ADCT, FHTX, PRLD, MGNX

International & Private Peers

Intro

The Biopharma industry has evolved from just a few drugs with >$1B in annual sales (i.e. blockbusters) to many therapies near >$10B in annual sales (i.e. "mega-blockbusters"). Oncology is also a category with plenty of upside left given two mega-blockbusters already including Merck's Keytruda (~$32B peak) and Bristol's Opdivo (~$13B peak) but broad evolution into IO doublets / triplets by the end of the decade. Bristol's Opdualag (co-formulated dual IO) could address many different tumor types after recent approval in melanoma, with peak consensus of only $2B.

SGEN in 2023 is focused on label expansion activities for Padcev (potential FDA approval in 1L mUC in 1H23 post the positive Cohort K data, data in Nectin-4 expressing solid tumors and studies in muscle and non-muscle invasive bladder cancer), Tukysa (Ph3 Kadcyla combination data in 1H23, while approval in metastatic colorectal cancer per the January 19, 2023 PDUFA would be incrementally additive to the commercial opportunity), Adcetris (Keytruda combination data) and Tivdak (solid tumors data update in 2023, including head and neck cancer) alongside progress across the early/mid stage pipeline including SGN-B6A (Ph1 interim data at SITC in addition to preclinical bispecific SGN-BB228 data), DV, SEA-TGT and SEA-CD40. CIDP results in 1Q23 present the biggest near-term inflection for ARGX, which is seen driving >$1B in additional risk-adjusted peak sales by 2030. For INCY, PhII data for povorcitinib in vitiligo will be presented in early 2023 at a medical conference. For the near-term, the next key catalyst for INCY is initial data from the BET and ALK2 LIMBER programs expected by YE22. EXEL remains on track to report overall survival data from the Phase 3 CONTACT-01 study for cabo/atezo in NSCLC by YE22. Topline data from the Phase 3 CONTACT-03 study are expected in 1H23. MRTX top ine results from the interim overall survival analysis (OS) for the Ph3 SAPPHIRE study of sitravatinib in 2L/3L NSCLC are still expected in 4Q22. RCUS Dom+Zim (TIGIT+PD1) Ph2 1L NSCLC topline data still expected later this year and full data in 2023. FATE's R&D Day in 1Q23 will provide a comprehensive update including updated FT516/FT596 data. ARVN ARV-471 Ph2 breast cancer data at SABCS in December is a key catalyst.

Industry Backdrop & Investment Considerations

The global oncology drug market is expected to be around $165B in 2021. There are approximately 18 million patients in the US alone, a 31% increase from 13.8 million in 2010. The current pharmaceuticals pipeline is disproportionately focused on cancer. Of the 15,267 assets across all phases of development, about 34% are oncolytic, up from 30% in 2013.

Of the 20 drugs in our coverage universe with $10B+ revenue potential, 7 have already achieved mega-blockbuster status (Comirnaty, Spikevax, Paxlovid, Keytruda, Opdivo, Eliquis, and Humira)

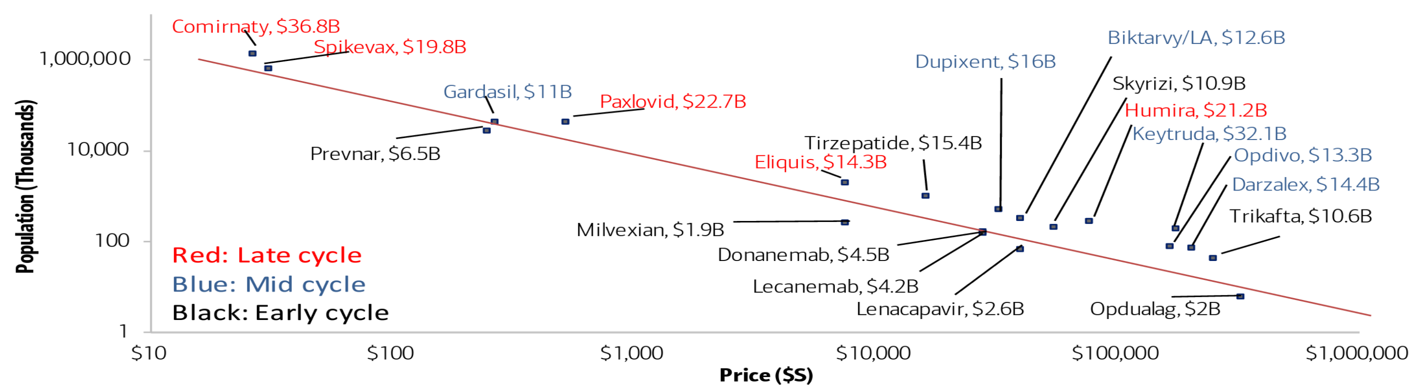


Exhibit 2: Top 20 drugs in our coverage universe with mega-blockbuster sales potential

Tirzepatide could potentially achieve the rare trifecta of population, duration, and pricing, resulting in potential sales in excess of $10B for diabetes and obesity

Drug	Indication	WW Peak Sales ($B)	Peak Sales Year	US %	Category	Addressable population	Duration	Pricing	Future Sales Potential
Darzalex	Multiple myeloma	$14.4	2028	54%	Mid cycle	+	=	++	✓
Opdivo	Solid tumor	$13.3	2027	59%	Mid cycle	++	=	++	✓
Biktarvy/LA	HIV	$12.6	2028	79%	Mid cycle	++	++	+	✓
Gardasil	HPV	$11.0	2030	23%	Mid cycle	++	-	-	✓
Tirzepatide	Diabetes, obesity	$15.4	2030	76%	Early cycle	+++	++	+	✓✓✓
Trikafta	Cystic fibrosis	$10.6	2030	66%	Early cycle	-	++	++	✓
Skyrizi	I&I	$10.9	2030	81%	Early cycle	+	+	+	✓
Prevnar	Pneumococcal	$6.5	2030	59%	Early cycle	++	-	-	✓
Donanemab	Alzheimer's	$4.5	2030	75%	Early cycle	++	+	+	✓✓
Lecanemab	Alzheimer's	$4.2	2030	70%	Early cycle	++	++	+	✓✓
Lenacapavir	HIV	$2.6	2030	50%	Early cycle	++	++	+	✓✓
Opdualag	Solid tumor	$2.0	2030	60%	Early cycle	+	=	++	✓
Milvexian	Atrial fibrillation	$1.9	2030	60%	Early cycle	++	=	=	✓

Indicators, Metrics & Stock Selection Framework

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Management Commentary

Genmab (GMAB) updating its progress…. "We've also grown and strengthened the team, and our financial foundation is even more robust. So we continue to feel really well positioned for growth moving forward. Excitingly, we have the potential to further increase the number of approved products in the coming year. Our earlier-stage investigational medicines will be recognized at this year's ASH with a poster presentation on preliminary dose escalation results for HexaBody-CD38 and preclinical data for DuoBody-CD30. If you look beyond our own pipeline and include all products that are powered by Genmab's innovations, there are more than 50 total abstracts accepted for presentation at this year's ASH. 10 of them oral presentations. And of course, DARZALEX continues to redefine the treatment of multiple myeloma. As you have seen J&J net sales for dara are up 35% so far this year, and that's generating more than DKK 7 billion in royalties for us, contributing materially to the robust financials I spoke about earlier."

Seagen (SGEN) on profitability….. "I think we are -- first, we have 4 approved drugs. All of them have development plans, all of them are looking for label expansion. And that's important to grow the existing brands. And it's -- I think it's pretty obvious, PADCEV has tremendous potential, Kaiser has potential, ADCETRIS despite its age, continues to have potential. And TIVDAK is just finding its way. It's begun in the disease of extremely high unmet need. We're looking to move that forward. And we have a basket trial running. As we do with all of these other products, looking not just for the sort of the entrant disease but another possible disease. And then from a -- in terms of like how would we view our pipeline is rich with ADCs. We understand the technology. We understand the development program. We can do things faster. We can get to a decision on go, no go. Is the molecule active enough or not? So I think from a -- how much spend do we bring to the table, we are able to be as efficient and as streamlined as I think is possible with a very large and diverse pipeline. Yes, profitability is something we stare out all the time with our Board. And it's clearly something we aspire to be someday. But I think what is most important to us, given the pipeline that we've got, the commercial assets that we've got, the track record that we've got is that we really position the company so that when we are profitable, we're doing it with the right trajectory, and that means a steep growth trajectory. I think when we -- assuming we can get label expansion for PADCEV into frontline metastatic bladder cancer, these become pretty meaningful opportunities. And it really speaks to the strategy that we've had as a company for a very long time, which is to invest in the clinical trials that will expand labels. We went from a 1-product company to a 4-product company in a very short period of time. So continuing to expand our commercial pipeline is important to us. And in order to do that, we've got to continue to invest in the early-stage pipeline in ADC research and science and innovation and bringing new things in. So we aspire to be profitable. We want to do it at the right time when we've got a great growth trajectory."

OptionsHawk Executive Summary & Focus Stocks

Oncology continues to be one of the best areas of Biotech and large-cap **SeaGen (SGEN)** remains a potential M&A target though also has an active catalyst path in 2023. **Argenx (ARGX)** and **BeiGene (BGNE)** are both favorites with major growth seen ahead while **Genmab (GMAB)** has $10B in cash and the best profitability. **Halozyme (HALO)** is a favorite long-term play and **Immunocore (IMCR)** is disrupting cell-therapy and could be an acquisition target. **Arcus (RCUS)** in the smaller cap tier looks like a value and potential M&A target given its many partnerships. **Arccellx (ACLX)** stands out among the very small names with its recent collaboration with Gilead (GILD) giving validation.

Biotech – Auto-Immune

Components: APLS, GLPG, XNCR, IRWD, FGEN, DICE, KYMR, IMVT, GOSS, CHRS, RAPT, TBPH, PRVB, MESO, SRRK, IMAB, ANNX, OMER

International & Private Peers

Intro

APLS announced the NDA amendment which includes 24-month data from the Phase 3 DERBY/OAKS trials of C3 drug pegcetacoplan (peg) for geographic atrophy (GA) has been accepted by the FDA with a PDUFA date of February 26, 2023. KYMR is uniquely positioned as a leading player in the emerging field of targeted protein degradation (TPD). KYMR expects initial clinical data in 2023 for two wholly-owned novel degraders (KT-413, KT-333) in development using a precision oncology approach for hematologic malignancies. GLPG key drivers include Jyseleca launch trajectory in RA and UC, Ph3 data readout of Jyseleca in CD in 1H23, and PoC data of CD19 CAR-T cell therapy in R/R NHL. XNCR interim Phase 2 vudalimab data is its next key driver. DICE's lead compound, DC-806, recently achieved early clinical proof of concept with potential in its 2023 readout and Phase 2b results.

Industry Backdrop & Investment Considerations

Autoimmune diseases have been a big focus area for Pharma with their multi-billion-dollar immunosuppressants. However, anti-FcRns have entered the field with more targeted therapeutic effects and the potential to transform the treatment of auto-antibody driven diseases.

Indicators, Metrics & Stock Selection Framework

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Key value drivers in Biotech include R&D Innovation, Catalysts, the Regulatory Regime, and Product Launches. There are a lot of extra considerations within Biotech investing, such as cash-burn for pre-clinical small caps to ensure companies are positioned to survive the long period without revenues.

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Management Commentary

Galapagos (GLPG) on its portfolio…. "So the portfolio we focus on, immunology and oncology, is a very important one because that focuses us on specific areas in immunology as well as bringing in a new area with high unmet medical need. Filgotinib, which is in the market, and the team will talk about it later for RA and UC, it's approved in Europe and doing very well. We expect big things from Jyseleca going forward as it really solidifies in the market. We will have a Phase III data for Crohn's disease in the first half of next year. And we are starting a new study, a new indication, axSpA, now in Phase II. We have good evidence for a strong TYK2 with 3667, and we started -- we are starting a study in dermatomyositis, followed by one in lupus in the course of next year. And then from our SIK portfolio, we will continue to further explore the SIK3 4399 in RA and the SIK -- the rest of the SIK portfolio in preclinical to see how can we bring this very interesting new targets into the clinic in a later stage. Really new for us is CAR-T. And we built CAR-T on the basis of having access and having -- bringing in CellPoint with access to a decentralized production tool. A small company like us could never have the ambition to be a large CAR-T company in the world with differentiated technology. And that's what we do here, combining a CD19 -- two CD19, two existing CD19s on a new platform, testing it out. It's in Phase I/II at the moment. We're entering with the BCMA into the clinic early next year. And then our later-stage objectives are having next-gen CAR-Ts to -- combined with the next-gen CAR-T platform for production, and so being a big player in this space."

OptionsHawk Executive Summary & Focus Stocks

This group features all smaller names with **Apellis (APLS)** the largest and its success rests on a late February PDUFA. **Dice (DICE)** is a likely M&A name following impressive proof of concept data that boosted shares in 2022. **Provention Bio (PRVB)** one of the more interesting small names after teplizumab gained FDA approval as the first treatment to delay the onset of Stage 3 type 1 diabetes in adult and pediatric patients aged eight years and older with stage 2 diabetes. PRVB now becomes a commercial story.

<u>Biotech – Neurological</u>

Components: BIIB, NBIX, KRTX, CERE, ITCI, ALKS, DNLI, HRMY, PRTA, ACAD, AMLX, XENE, SAGE, RVNC, SUPN, AXSM, SAVA, BHVN, AVXL, ALEC, CARA, GHRS, ATAI, CMPS, AVDL, BTAI, MRNS, RLMD

International & Private Peers

Intro

The BIIB focus is clearly on Eisai-partnered lecanemab in Alzheimer's as the MS franchise erodes. Competing data seen coming for Ph3 data for ROG's gantenerumab at CTAD and LLY's donanameb by mid-23. NBIX has been posting strong Ingrezza beats and now the focus shifts to label expansion in Huntington's disease (HD) chorea expected in 2023, crinecerfont (CRF1 receptor antagonist) in congenital adrenal hyperplasia (CAH), with topline data from phase 3 adult and pediatric studies expected in 2023, NBI-921352 (selective sodium channel blocker) with phase 2 data expected in 2023 and more.

ACAD has a March 12th PDUFA for trofinetide in Rett syndrome. HRMY reported topline data from the Ph2 POC study evaluating Wakix for excessive daytime sleepiness (EDS) in patients with Prader-Willi syndrome (PWS). DNLI will present data from the ongoing Ph1b study of DNL343 (eIF2B activator) in participants with amyotrophic lateral sclerosis (ALS) at the International Symposium on ALS/MND (December 6-9) and more data in 2023 from the Ph1/2 study of DNL310 in Hunter Syndrome and the Ph1b study of DNL343 in ALS, as well as potentially healthy volunteer data for DNL919 (ATV:TREM2). The company also plans to begin a late-stage study for DNL343 in ALS next year and file an IND for DNL126 (ETV:SGSH) for Sanfilippo syndrome (MPS IIIA; rare genetic condition that causes fatal brain damage) in 1H23. CERE is conducting two Phase 2 studies, EMPOWER-1 and EMPOWER-2, of emraclidine in schizophrenia, with data expected 1H24. ITCI focus is on the Caplyta launch and late-stage studies of lumateperone in expansion indications, as well as early-stage investment into new formulations of lumateperone, and other pipeline candidates. KRTX new KarXT efficacy data showed a best-in-class clinical profile topline data from EMERGENT-3 in 1Q23 (representing a second shot on goal, albeit only one trial is necessary for filing) and from the Ph3 ARISE adjunctive trial in 1H24 are the next major clinical drivers. AXSM commercialization efforts are in focus with script data for Auvelity and top-line results from the PhIII ACCORD study remain on track for 4Q22 while AXS-07 NDA for migraine is expected to be resubmitted in 3Q23. AXS-12 in narcolepsy PhIII data is expected in 1H23 and AXS-14 in fibromyalgia, an NDA submission is expected in 2023. For RVNC commercial execution is in focus for Daxxify and RVNC submitted a Daxxify sBLA for cervical dystonia (CD), which could lead to an approval in 4Q23.

Industry Backdrop & Investment Considerations

This space represents another that has seen significant growth in R&D efforts over the past several years. Given the complexity of CNS diseases and the challenges of developing drugs in the space, the amount of innovation in the space has been limited compared to other areas like oncology. With growing awareness of the importance of mental health, better understanding of the underlying biology of neurological diseases, and advancement in technology making previously “undruggable” targets “druggable”, the field has become one of the most exciting and active for drug development.

Indicators, Metrics & Stock Selection Framework

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Management Commentary

Biogen (BIIB) on its future…. "Beyond Alzheimer's Biogen has important opportunities in other therapeutic areas where the unmet medical need remains significant. This includes depression where, together with Sage, we are continuing to advance the regulatory filing for zuranolone in both major depressive disorders and postpartum depression. With a novel mechanism of action, efficacy observed as early as 3 days and a consistent safety and tolerability profile across 8 clinical studies, we believe that zuranolone, if approved, could be a meaningful new therapy for depression. Second, the FDA has accepted our filing for tofersen in SOD1-ALS under the accelerated approval pathway and granted priority review. While the study did not meet the primary endpoint at 6 months, longer follow-up has shown that patients who remain on tofersen experienced a slow rate of decline in key clinical measures, including lung functions, muscle strength and quality of life. We are truly encouraged by these results in such a debilitating and fatal disease and look forward to an FDA decision expected by April of next year. We believe this near-term opportunities, along with new launches of biosimilars, have the potential to drive renewed growth and position us to have 5 key franchises by 2025. Furthermore, we see the potential for additional growth drivers in the mid to late 2020s in areas such as Parkinson's disease, lupus and stroke, all with programs currently in Phase III. Overall, we believe that we are at an inflection point in CNS drug discovery and development. And these recent developments embody key advancements that are being made in neuroscience."

Neurocrine (NBIX) on opportunities ahead…. "INGREZZA has done extremely well. It is a drug that the very first drug ever to treat a disease called tardive dyskinesia, TD for short. That's a disease that is caused by taking long-term antipsychotics, very important drugs, drugs that have changed people's lives, otherwise would not be able to function out in society. So it is not a cure, but it is a once-a-day, very well-tolerated drug that has made real difference in these patients' lives. Prior to INGREZZA, out of the estimated 600,000 individuals in the United States that have tardive dyskinesia, maybe 2% had a diagnosis of TD. Today, through a lot of our efforts, it's approximately 30%, we believe, have been diagnosed with TD. But as of -- even at that low level, there's a lot of room to go. 7 out of 10 patients suffering with TD have not received even a diagnosis. Of that 30%, only about half of them get a VMAT2 inhibitor, which is recommended by APA guidelines as being the first route of therapy. In addition to INGREZZA, we have approximately 13 programs in the clinic right now, 12 of them are in Phase II or Phase III clinical trials. One is a new one that we started Phase I on this year. And again, it goes across neurology, neuropsychiatry and neuroendocrinology. We are a very active company in the business development -- we're also a very active company in our own internal research"

OptionsHawk Executive Summary & Focus Stocks

The Neuro space has been one of the top performing groups in Biotech and M&A remains healthy as large Pharma looks to grow in this space. **Biogen (BIIB)** potential in Alzheimer's makes it a lead play and remains cheap at 17X earnings. **Intra-Cellular (ITCI)** is a name I like for the potential of CAPLYTA with potential label expansion and profitability by 2024, which also makes it a possible M&A target. **Karuna (KRTX)** recent data is being called game-changing and has a lot of catalysts ahead in 2023. In the $2B to $4B group **Cerevel (CERE)** an intriguing speculative name with a lot of readouts the next 12-18 months in areas of high unmet needs. **Harmony (HRMY)** continues to screen as very undervalued and seeing strong commercial success. **Axsome (AXSM)** is a top M&A target in my view as it continues to see a lot of clinical success. **Amylyx (AMLX)** is another top M&A target following its recent surprisingly strong data. **Revance (RVNC)** is also a clear M&A target in my view and has a massive bull trade in April open interest. Lastly, **Xenon (XENE)** is a speculative favorite for potential of its lead asset it epilepsy and depression. As you can see, I feel there are plenty of ways to win in Neuro Biotech.

Biotech – Rare & Genetic Diseases

Components: VRTX, BMRN, HZNP, JAZZ, ASND, CORT, FOLD, RARE, ZLAB, INSM, RXRX, NVAX, BBIO, TVTX, RYTM, KNSA, ANAB, NKTR, STOK, VNDA, ATRA, GBIO

International & Private Peers

Intro

VRTX remains a commercial success story while next gen CF triple combo, enrollment in two Ph3 studies (SKYLINE 102/103) is on track for completion before YE22 for CF patients 12 years and older. For CFTR mRNA therapeutics, the drug is designed for ~5,000 CF patients who do not produce CFTR proteins, in collaboration with Moderna, with IND submission planned for 4Q22. BLA submission for SCD and TDT will begin in Nov. and is expected to complete by the end of 1Q23. EU and UK submissions are on track for 4Q22. For BMRN EtranaDez is likely to be approved by the FDA in Hemophilia B while Voxzogo has been in focus with competitive concerns. IND filings are planned for BMN351, BMN349 and BMN293 (DiNA-001) from early 2023 to 2H23.

Industry Backdrop & Investment Considerations

The rare/genetic disease industry is becoming a more attractive area of investment due to 1) public support, 2) flexibility in regulatory path and beneficial designations, 3) financial incentives, 4) (less) competitive pressure, and 5) power of science and technology collectively providing a strong rationale.

Indicators, Metrics & Stock Selection Framework

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Management Commentary

Vertex (VRTX) at Jefferies Healthcare Conference on its leadership and milestones upcoming…"Clearly, we've continued to extend our leadership in cystic fibrosis, TRIKAFTA, our medicine that can treat up to 90% of CF patients continues to perform incredibly well. And we have a number of important milestones coming up for TRIKAFTA and the rest of the CF franchise that I'm happy to talk about that we'll continue to expand our leadership in CF. Beyond CF, we have 5 additional disease areas where we've demonstrated proof of concept. Actually, 5 out of the 6 disease areas that we took medicines into proof-of-concept hit in terms of proof of concept. Those 5 disease areas, many of them are in late-stage development. And so we are now preparing for commercialization for what we hope will be our next disease areas after CF, sickle cell disease and beta thalassemia with exa-cel, our CRISPR/Cas9 gene editing therapy, and then also preparing for acute pain in the U.S. where VX-548, our NaV1.8 inhibitor, has just begun its Phase III program. And because of the revenue growth that we've seen in CF and because of our unique business model, we have generated industry-leading margins. We have a substantial financial balance sheet, which allows us to continue to invest in internal and external innovation. So VX-548 is in Phase III. Our exa-cel program, we are putting together our filings to begin filing at the end of this year. Our AMKD program is in a Phase II/III study. We are moving these programs forward. Many of these programs are in late-stage development. We have a number of milestones in CF that we are going to complete by the end of this year. We will file for TRIKAFTA in 2- to 5-year-old kids around the world by the end of this year. We're on track to do that. We will complete enrollment in our next-generation triple combination program, which is a combination of 3 separate medicines, vanzacaftor, previously 121; tezacaftor; and deutivacaftor, and we believe that combination has the potential to be even better than TRIKAFTA. And we're also on track to file our IND for our mRNA program, which will help us try and address the 5,000-or-so patients who don't respond to our CFTR modulators and so don't have a therapy that treats the underlying cause of their disease to gain."

Horizon (HZNP) on read outs….. "So overall, the commercial business performed well in the quarter, had some strong readouts on our dazodalibep commercial, our Sjögren's clinical program that Theresa will get into some specifics. So we met the primary outcome and excited to see some further readouts there. We also have our chronic study that's done enrollment with TEPEZZA that I'll read out in the second quarter of next year. And we also have a number of other pipeline data that is going to be coming out over next 12 to 18 months. So good progress so far. And we upped our guidance to $3.6 billion at the midpoint in revenue and $1.33 billion at the midpoint and adjusted EBITDA, so continued growth there as well. So all of that has given us confidence in that mid-teens growth that we've guided to for 2023. We anticipate then second quarter getting the readout of our chronic trial, which is looking at patients who have eye bulging or proptosis and/or double vision, it's called diplopia, who have a lower clinical activity score."

BioMarin (BMRN) on expansion of indications…. "So Akash, I think there's a lot to like in terms of revenue potential for both VOXZOGO and its initial, like, indication for achondroplasia and also ROCTAVIAN for severe hemophilia A. And within those indications, there's a lot of life cycle management expansion that we're working diligently on as we sit here today. So for VOXZOGO, think about getting into younger age segments, and we've got the data to support it. We're actively working on that, opening up additional patients to treatment. For ROCTAVIAN, there's literally a pipeline of expansion indications there from the initial severe hemophilia A patients that are adults working on testing ROCTAVIAN and adolescents in patients with active and prior inhibitors, for example. These are all opportunities to expand the addressable market, and we're super excited about that. Also think about the variability of VOXZOGO being a chronic therapy and a chronic revenue driver and ROCTAVIAN being really exciting as a big onetime revenue driver. We've guided to expectations in Germany, our first market in Europe of approaching EUR 1.5 million per patient treated, and all of that revenue would be recognized upfront. So what I would say, and back to your original question, Akash, is I would expect both VOXZOGO and ROCTAVIAN to be really big in dynamic revenue drivers over the next 5 years, and watch them both. It's going to be exciting."

OptionsHawk Executive Summary & Focus Stock

Our top 2023 pick in this group was set to be **Horizon (HZNP)** but Amgen (AMGN) announced a deal for HZNP in December. **Vertex (VRTX)** is a quality name but at 21X Earnings looks pricey with modest revenue growth ahead. **BioMarin (BMRN)** is the preferred large cap with strong growth seen ahead and should see profitability start to ramp with likely strong revenues coming from Roctavian in HemA. **Insmed (INSM)** looks to be an attractive small cap with Arikayce potential across multiple lung diseases. **Ryhthm (RYTM)** and **Kiniksa (KNSA)** are two smaller speculative names that screen attractively, the latter well-funded through 2025.

Biotech – RNA Therapeutic, Infectious & Vaccines

Components: MRNA, BNTX, ALNY, IONS, ARWR, VIR, BCRX, PCVX, CVAC, EBS, ANIP, ALT, ALVR, INO, ALLK, AVIR, ARCT, URGN

International & Private Peers

Intro

The main players in this group benefitted from COVID-19 vaccine sales and are now figuring the next path forward as the trajectory for future sales weakens but mRNA potential remains vast. MRNA expects Flu/RSV Phase 3 flu vaccine immunogenicity data 1Q23 to support accelerated approval while PCV Phase 2 top-line data remains on track for for 4Q22. Management indicated that respiratory vaccines will be the near term driver, and latent viral vaccines (Ph3 CMV, Ph1 EBV), oncology (Ph2 PCV, Ph1 checkpoint vaccine), and rare disease programs will provide diversity in the second half of the decade. BNTX pipeline catalysts are also in focus in 2023 with PCV Phase 2 readout on 1L melanoma on tract for 1H23, and management highlighted opportunities in the adjuvant setting such as pancreatic cancer with ~70% recurrence rates. BNTX is presenting preclinical data of GEN1053/BNT313 (a monospecific HexaBody targeting CD27) in solid tumor at SITC2022 and Ph1/2 data of GEN1042/BNT312 (CD40X4-1BB bispecific) at ESMO I/O 2022. Supply vaccines to China is another potential catalyst. For ALNY, ALN-APP Ph 1 data expected early 2023 while Onpattro's regulatory path remains in focus. Amvuttra will continue to drive topline growth into FY23 given that Amvuttra's J-Code will come online in January. IONS is seen having an eventful 2023 potentially adding two commercial products to the portfolio in 2023 with eplontersen and tofersen, which is currently under Priority Review with a PDUFA of April 25, 2023. IONS also plans to advance two new products to the pipeline in 1H23. Olezarsen is also progressing with BALANCE in FCS to read out in 2023 and readouts in CORE and CORE2 for sHTG in 2024. ARWR is nearing interim readouts of two of its major CV assets at AHA 2022.

Industry Backdrop & Investment Considerations

mRNA development programs remain early stage but the $6B seasonal influenza market is also being targeted. Seasonal influenza is the fourth largest category of vaccines. mRNA has three key factors set to disrupt the traditional vaccine market with higher efficacy, speed of production and approval, and flexible manufacturing.

Indicators, Metrics & Stock Selection Framework

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Management Commentary

Moderna (MRNA) on pandemic phase…..“As you look to 2023, we all expect that some of what's been happening in the pandemic phase, including many countries boosting twice a year, will moderate. And I think scientifically, we would expect that to start to approach more of a seasonal market, where people are getting a seasonal booster, much like they do the flu vaccine. So there's plenty of additional contracting that we expect to happen over the -- really the season starts in sort of December, January, February for signing up those agreements. So we think there's going to be strong demand for the vaccines and boosters because they reduce costs for healthcare systems, the same year you deploy them, just like the flu vaccine.”

Ionis (IONS) on key programs…. “We also just this weekend, released open-label extension data on our HAE program, where we have donidalorsen, which is a PKK inhibitor. And we saw a very nice maintenance of what we hope is best-in-class profile in a Phase III trial that's being tested now with a monthly therapy for HAE. We also have been progressing our olezarsen program, which is another Ionis wholly-owned asset in addition to donidalorsen that we intend to commercialize ourselves, as we become a commercial stage company. And that program has a readout in a rare disease, FCS, a Phase III study that was fully enrolled this year, slated for next year. And then we've got 3 additional Phase III studies that got started for a much broader indication, severe hypertriglycerides, which is patients who have triglycerides greater than 500 and those trials are underway, and we'll read out '24. Beyond that, we have the tofersen program partnered with Biogen, where we had positive data presented by Biogen on early start versus late start tofersen, that NDA has been accepted, and we have a PDUFA date in April for that drug, very optimistic about the tofersen works. It lowers neurofilament. So we're excited about that program. We also have another late-stage asset that I'm particularly -- I think it's particularly cool as pelacarsen. This lowers LPA. It's testing a novel hypothesis in cardiovascular risk reduction that's independent of LDL partnered with Novartis. It's in an 8,000-patient cardiovascular outcome study, which has reached full enrollment this year. I guess quick there on the pipeline beyond that, in the technology space, we continue to progress our technology.”

OptionsHawk Executive Summary & Focus Stocks

Moderna (MRNA) is tricky as it will see sharply declining revenues while it has upside with new programs including recent success in cancer with Merck, but **BioNTech (BNTX)** with $13B in cash and trading much cheaper with higher margins is preferred despite also facing headwinds of declining Covid revenues. **Alnylam (ALNY)** is the clear favorite growth name in this group with Onpattro in focus. **Vaxcyte (PCVX)** a potential M&A

target with recent strong data showing potential best-in-class vaccines in a $40B infectious disease market. The sub $2B market cap names in this group are messy and none really stand out as attractive.

Biotech – Regenerative Medicines

Components: DNA, VCEL, RNA, DYN, ORGO, ANIK, HUMA

International & Private Peers

Intro

There are not many names in this group currently and very speculative with DNA the only name over $1B. DNA is seen well-positioned to unlock the $40B cellular programming TAM today (which is comprised of ~$15B in the biotech/cellular engineering tools market and ~$25B in the biotech/cellular engineering labor market), with the opportunity to participate meaningfully in the ~$2-4 trillion of annual direct economic impact attributed to bioengineered products over the 2030-2040 timeframe.

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Regardless of the macro environment, innovation-driven companies with proprietary scientific capabilities aimed at developing potential first-in-class and/or best-in-class medicines for significant and un-deferrable unmet needs – will outperform over time.

Key value drivers in Biotech include R&D Innovation, Catalysts, the Regulatory Regime, and Product Launches. There are a lot of extra considerations within Biotech investing, such as cash-burn for pre-clinical small caps to ensure companies are positioned to survive the long period without revenues.

Biotech is unlike any other investing as pre-clinical names carry a lot of event-risk and it is difficult to make a confident investment without having a medical background. One of the better investment approaches is early-stage commercial launches. A lot of the value of a Biotech company is within its pipeline so traditional metrics often do not provide major insight. M&A potential is a key contributor to the valuation framework as well considering the large cash firepower held by large cap Pharma/Biotech and the willingness to deploy to improve their respective pipelines and growth profiles. Biotech requires more in-depth research than any other industry for investing though utilizing options flow and price action can typically be a strong work-around to identifying the most valuable plays in the space. Product cycle and pipeline optionality are key drivers.

Management Commentary

Ginkgo (DNA) on biosecurity…. "There's palpable momentum in this space. This fall alone, we saw several important White House initiatives prioritizing biosecurity. The U.S. government is clearly focused on it, and Ginkgo is very aligned with these priorities and is ready to help lead the future of this industry. So how do you get it in your head? What would be the components of a long-term biosecurity infrastructure globally? So our first formal offering spurred by COVID was building a collection platform. So this is the infrastructure layer between specific collection activities and local labs that will run the lab analytics on the samples that are collected, okay? So COVID monitoring remains an important part of our business, but we're focused on helping drive more widespread surveillance and monitoring of biological risk in general. The CDC recently started, including data from our airports program, in their variant tracker, and we recently hosted the Director of IARPA at Ginkgo for a press conference to announce the success of Ginkgo's NDAR program. So this is the vision we've had that biosecurity is really distinct from diagnostics or therapeutics. So products like NDAR, so we call this sort of thing like a radar for engineered biology, are a great example of a pure-play biosecurity product, okay? It's not a diagnostic tool, right? Diagnostic tools don't need to know if a piece of DNA has been engineered or not. It's a pure-play biosecurity product, and expect to see more of those."

Anika (ANIK) on Cingal opportunity…. "Based on our commercial success internationally and the strength of our clinical data, we remain highly confident in the differentiated clinical benefits that Cingal delivers compared to both the current treatment options on the market and products we see in development. Anika continues to control full global rights for Cingal and we intend to proceed thoughtfully as we evaluate our options to continue to commercialize Cingal to best serve osteoarthritis patients around the world. We believe Cingal has the potential to address a true unmet medical need for the more than 32 million patients in the United States suffering from osteoarthritis with an estimated next generation OA Pain Management U.S. market opportunity of at least $1 billion and additional expansion opportunities internationally. We will be engaging with the FDA in the coming months regarding next steps for U.S. regulatory approval."

OptionsHawk Executive Summary & Focus Stocks

This is a small group without a lot of interesting investment opportunities. **Dyne (DYN)** one to watch into DELIVER trial results in 2H23 but otherwise not a very attractive group of stocks.

Biotech – Ophthalmology & Dermatology

Components: REGN, ISEE, AUPH, ARQT, VRDN, AERI, BLTE, TARS, NGM, KOD, OCGN, OPT

International & Private Peers

Intro

REGN the large cap in this group has faced concerns of slowing Eylea momentum but Libtayo and Dupixent continue to thrive while Eyelea's high dose BLA on-track to be submitted by YE22 with potential August 2023 approval. EU regulatory decisions for EoE, PN, and pediatric AD in 1H23 expected for Dupixent. An FDA decision on Libtayo +chemo in NSCLC for Libtayo expected in 2023. ISEE is an up and coming play with recent FDA Breakthrough Therapy Designation (BTD) for the treatment of geographic atrophy. ARQT's launch of Zoryve and PhIII AD data are the focus there. BLTE an interesting newer name focused on the development of a novel once-daily oral drug for the treatment of Stargardt disease, a rare inherited juvenile-onset form of macular degeneration without any approved treatment. VRDN having a solid year with successful data in thyroid eye disease.

Industry Backdrop & Investment Considerations

The global ophthalmic disease therapeutics market size is around $35B and seen growing at a 6.5% CAGR through 2028. The retinal disorders segment dominated the market for ophthalmic drugs and accounted for the largest revenue share of 33.5% in 2020.

The global dermatology drugs market size was $40B in 2020 and is projected to reach $65B by 2027, a CAGR of 12.9%.

Indicators, Metrics & Stock Selection Framework

Regardless of the macro environment, innovation-driven companies with proprietary scientific capabilities aimed at developing potential first-in-class and/or best-in-class medicines for significant and un-deferrable unmet needs – will outperform over time.

Key value drivers in Biotech include R&D Innovation, Catalysts, the Regulatory Regime, and Product Launches. There are a lot of extra considerations within Biotech investing, such as cash-burn for pre-clinical small caps to ensure companies are positioned to survive the long period without revenues.

Biotech is unlike any other investing as pre-clinical names carry a lot of event-risk and it is difficult to make a confident investment without having a medical background. One of the better investment approaches is early-stage commercial launches. A lot of the value of a Biotech company is within its pipeline so traditional metrics often do not provide major insight. M&A potential is a key contributor to the valuation framework as well considering the large cash firepower held by large cap Pharma/Biotech and the willingness to deploy to improve their respective pipelines and growth profiles. Biotech requires more in-depth research than any other industry for investing though utilizing options flow and price action can typically be a strong work-around to identifying the most valuable plays in the space. Product cycle and pipeline optionality are key drivers.

Management Commentary

Regeneron (REGN) on 8mg data and other successful products…. "In September, early September, we came out, and I'm sure we'll get into some detail with regards to our 8 mg data, which we were like super, super pleased. People were talking about 30% to 40% kind of being table stakes. If you got to 40% in terms of the number of patients, you can over a 40-week -- 48-week trial that you can keep at 16 weeks, 40% would be great. We cash in at 77% for wet AMD and 89% for DME, just to tell you that is the way beyond what the company thought we were going to do, and we're very, very pleased with how that turned out. With regards to DUPIXENT, we had -- again, this is a partner -- this is a partnered product with our friends from Sanofi. We had record-breaking Q3 sales numbers as we did for U.S. EYLEA, we had our highest numbers yet. And the indications continue to come. We actually really love where the price was relative to our intrinsic value in the third quarter and ended up buying back $930 million of stock."

Arcutis (ARQT) on AD opportunity…. "We see a very large unmet need in atopic dermatitis in spite of all the recent progress. It's a very large and rapidly growing market. I think DUPIXENT is a very good drug, and you've got some newer options coming along as well. But even with those innovations, less than half of patients are able to achieve the 75% improvement in their disease. And so we see a real opportunity to continue to advance the standard of care."

Viridian (VRDN) on its market…. "Over the last quarter, Viridian continued to execute on all pillars of our strategy, designed to deliver the most complete portfolio of products for the treatment of thyroid eye disease across the world. TED, as you know, is currently a $2 billion market in just the United States and is expected to grow to over $4 billion globally with just one product currently approved. For our IV VRDN-001 program, we're excited to share positive results from our second proof-of-concept cohort. Data will review today for 20 mg per kg, confirm the profile we initially presented for 10 mg per kg a few months ago. The data compares favorably to TEPEZZA on each key endpoint, including proptosis response rate, overall response, change in Clinical Activity Score, or CAS, proportion of patients achieving a CAS of 0 or 1, and resolution of diplopia.

OptionsHawk Executive Summary & Focus Stocks

Regeneron (REGN) the clear leader in this group but a similar situation to Vertex (VRTX) as a best-in-class name but entering a slower growth period and trading 17.5X already. **IVERIC (ISEE)** screens as a highly likely acquisition target following its recent impressive data. **Belite (BLTE)** a speculative favorite focused on the development of a novel once-daily oral drug for the treatment of Stargardt disease, a rare inherited juvenile-onset form of macular degeneration without any approved treatment. **Viridian (VRDN)** is another potential

M&A target with it well positioned for leadership in the over $2B thyroid eye disease market and could challenge HZNP's Tepezza.

Pharma – Large Diversified

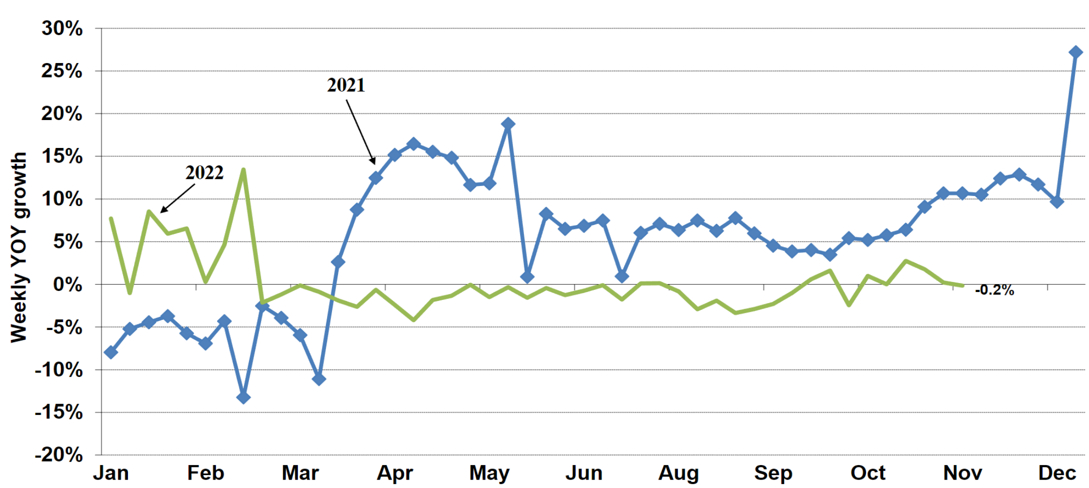
Components: ABBV, AMGN, AZN, BMY, GILD, GSK, JNJ, LLY, MRK, NVS, PFE, SNY, TAK, NVO, HCM

ABBV	Autoimmune	Oncology	Infectious Disease		
AGN	Aesthetics	GI	CNS	Ophthalmology	Women's Health
AMGN	Autoimmune	Oncology	Bone Health	Cardiovascular	Nephrology
BIIB	CNS	Rare Diseases			
BMY+ CELG	Oncology	Cardiovascular	Autoimmune		
GILD	Antiviral	Liver Disease	Oncology		
JNJ	Oncology	Autoimmune	Cardiovascular	CNS	Infectious Disease
LLY	Diabetes	Autoimmune	Oncology		
MRK	Oncology	Diabetes	Vaccines	Infectious Disease	
PFE	Oncology	Vaccines	Autoimmune	Rare Diseases	
REGN	Ophthalmology	Autoimmune	Cardiovascular	Oncology	

International & Private Peers

Intro

The Biopharma industry has faced pressures from inflation and FX as well as higher rates. Industry-wide topics include capital allocation and the impact of the Inflation Reduction Act. LLY has been a top performer with the Mounjaro blockbuster launch in focus along with strong Trulicity numbers. Ph3 Alzheimer's data in TRAILBLAZER-ALZ2 trial for Donanemab in mid-2023 is a key event. PFE remains a name with an uncertain outlook for COVID-19 driven sales while Etrasimod (oral S1P) for ulcerative colitis (UC) has shown a best-in-clas profile. ABBV investor focus is on Humira erosion, aesthetics outlook into uncertain consumer picture, and the Rinvoq/Skyrizi growth set-up. MRK is seeing strong results from Keytruda and Gardasil and SQ formulation of Keytruda has Ph3 lung data in 2023. BMY is launching several new products like Camzyos & Sotyktu so commercial execution will be in focus. Amgen is becoming a major biosimilar player and AMG133 for obesity and Amjevita biosimilar launch are the current focus for investors.



Note: TRx= Total Prescription. See definition above.
Source: IQVIA

Industry Backdrop & Investment Considerations

The Pharma sector is estimated to have solid fundamentals with 6% sales CAGR and 10% earnings CAGR for 2020-2024, generating stable amounts of cash with 46% of that seen returned through dividends and 10% utilized in buybacks. This would leave more than $300B excess cash flow for external R&D and acquisitions. Pharma reform presents near-term headwinds with pricing in focus.

Prescription drug sales are generating over a trillion dollars in annual revenue for the industry, and are projected to grow to $1.4tn by 2026, an MSD+ multi-year CAGR, as new therapies and modalities enter the market. This growth also coincides with a continued shift towards more biologic and novel therapies (such as Cell & Gene Therapy), which are projected to comprise 37% of global prescription sales in 2026, vs 19% in 2012 and 30% in 2020. This shift is even more notable in terms of the number of drugs, where biologics are expected to comprise more than half of the top 100 selling drugs in 2026.

Oncology is the area with the largest proportion of clinical development spending with 40% of total pipeline expenditure, with close to 20% market share of pharma sales in 2024. R&D spend is forecast to grow at a CAGR of 3.0% to 2024, lower than the CAGR of 4.2% between 2010 and 2018, partially driven by companies focusing on smaller indications with lower clinical development cost burden.

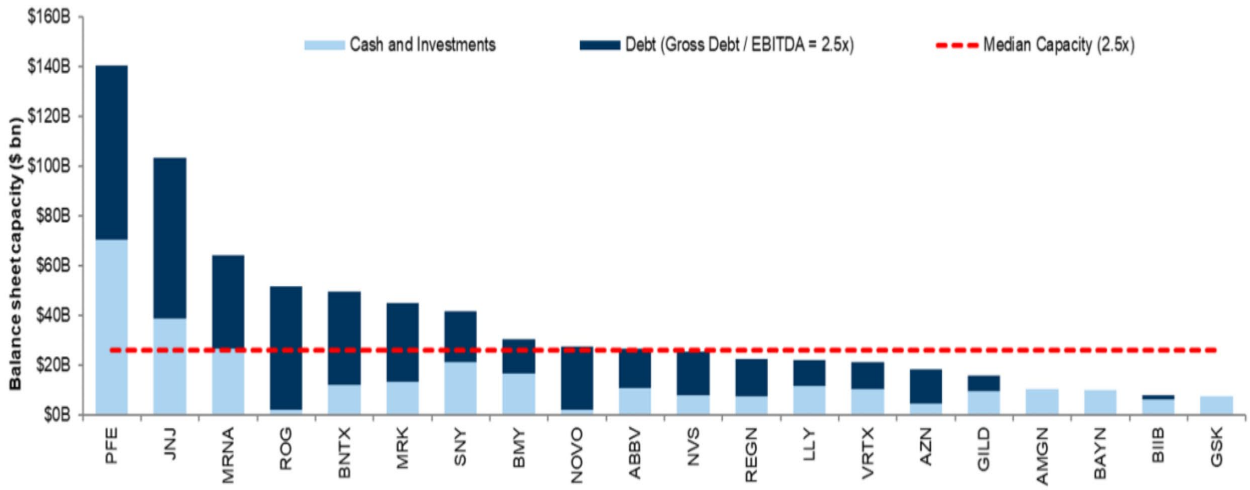
The core of the Biopharma business model has been and will continue to be driven by the discovery and development of new therapies and/or platforms that can prevent (vaccines), treat (cancer, diabetes and rheumatoid arthritis) and even cure (antibiotics, hepC antivirals and potentially gene therapy) diseases. Three fundamental drivers of biopharma stocks are pipelines, commercial products and patents.

Indicators, Metrics & Stock Selection Framework

PE, PEG, EV/Revenues, EPS Growth, Revenue Growth

Valuation and Comps

Ticker	Company	Mkt Cap	P/E FY1	Net Income CAGR (Fy0-2)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Large Diversified				#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
JNJ	Johnson & Johnson	465.0B	17.70X	1.29%	2.74%	32.00%	3.88%	15.63%	-4.29%	-4.49%
LLY	Eli Lilly And Co	349.0B	47.19X	6.23%	5.29%	28.91%	1.84%	20.85%	-9.22%	1.31%
ABBV	AbbVie Inc	292.4B	11.92X	-5.82%	-6.96%	53.40%	7.37%	15.29%	-1.82%	-3.15%
PFE	Pfizer Inc.	292.8B	8.07X	6.79%	-22.04%	44.76%	12.23%	15.93%	-12.48%	-8.10%
MRK	Merck & Co Inc	276.3B	14.75X	12.49%	-1.68%	37.15%	4.29%	13.92%	1.94%	3.18%
NVO	Novo Nordisk A/S (ADR)	290.5B	37.59X	22.59%	15.25%	44.30%	2.90%	37.04%	9.42%	11.08%
NVS	Novartis AG (ADR)	218.5B	14.50X	-5.28%	0.51%	33.34%	5.54%	8.6%	-3.83%	-4.38%
AZN	AstraZeneca plc (ADR)	215.5B	20.71X	18.48%	4.19%	31.08%	#VALUE!	8.18%	-0.30%	1.81%
BMY	Bristol-Myers Squibb Co	167.7B	10.37X	0.54%	2.65%	45.77%	9.31%	17.72%	-1.86%	-2.17%
AMGN	Amgen, Inc.	147.7B	15.68X	1.41%	3.56%	49.26%	#VALUE!	16.73%	0.20%	0.38%
SNY	Sanofi SA (ADR)	116.8B	10.27X	8.56%	4.39%	34.24%	8.57%	5.28%	9.74%	6.93%
GILD	Gilead Sciences, Inc.	111.1B	12.47X	-4.95%	-3.54%	46.66%	#VALUE!	12.95%	9.28%	8.37%
GSK	GSK plc (ADR)	72.6B	8.53X	-4.18%	0.59%	33.27%	2.32%	4.38%	-9.65%	-19.20%
TAK	Takeda Pharmaceutical Co Ltd (ADR)	45.7B	19.87X	#VALUE!	-3.06%	#VALUE!	#VALUE!	(0.552%)	32.22%	12.29%
HCM	Hutchison China MediTech Ltd	2.5B	-7.09X	22.65%	11.87%	-99.30%	#VALUE!	(68.123%)	16.94%	-13.21%



Management Commentary

Pfizer (PFE) on 2023….. "But if you look at -- as we cycle into '23, I think there's a couple of things to keep in mind, and I'll come back to like the back half of the decade as well. But as we cycle into '23, we're launching a significant number of new products, new indications in the market. Probably the single largest year of new product launches, certainly in the last 20 years, maybe in the history of the company. So I think we're excited about getting some momentum behind that. I think we're also excited about the BD deals that we did, both from Global Blood as well as Biohaven in those markets, in those medicines, getting behind those and actively marketing those around the globe. So I think we feel constructive about the top line and the momentum we'll have from a product perspective. I think with that comes investments, you can't launch a new product and, I guess, a stable of new products without getting behind it from an investment standpoint. So I would not expect us, as a year, to step back from an SG&A perspective. I think that '23 is a year of investment as we think about getting behind these products such that '25 and '30, these products begin to peak out and be very productive as I think about it."

AbbVie (ABBV) on M&A, Growth and Debt…. "We feel we're very well positioned with the 5 key therapeutic areas that can drive long-term growth that we've said will deliver high single-digit growth in the second half of this decade, which would be industry-leading. We'll also have the lowest LOE exposure in the industry after 2023. And so we feel like we have the portfolio. We don't need to do -- we don't need to do something on the M&A front. That said, given the rapid paydown of debt, we'll have leverage below 2x. It will be 1.8x at the end of this year, $30 billion of cumulative reduction. We have $4 billion of maturities next year that we plan on paying off. They will essentially have paid off all the incremental financing from the Allergan transaction. So we will be in a position where as we look at the universe, there's an interesting opportunity. We'll have the financial flexibility and the firepower to be able to do that. That said, we don't feel like we need to do something. So we have an active BD group that looks -- always looks for opportunities. But given the portfolio we have today, the pipeline and the prospects of the business, we're certainly -- we won't be doing it out of a need to do something. It will be more -- if there's an interesting opportunity, we have the flexibility. If you think about QULIPTA and the opportunity in chronic migraine and really rounding out that the migraine portfolio. And then for us, continue to drive the expansion for immunology and RINVOQ and SKYRIZI and we have very nice early feedback on the gastro indications really across all the indications, but really, we're seeing very nice growth there. So I'd say that would be another key catalyst as you look at the opportunity for RINVOQ and SKYRIZI to essentially replace Humira over the long term. We've said they'll exceed the peak revenue of Humira."

Merck (MRK) on expanding margins…. “So by 2025, we do expect to see our operating margins to be north of 43%. That's the number we've had out there for a while. We continue to believe we're on track for that. And in fact, if you look at where we've been over the last couple of years, you have -- and even what we're seeing in '22 based on the guidance we just gave in the second quarter for the full year, you are seeing continued growth in our margins. So in reality, both product mix as well as continuing to drive manufacturing efficiencies and overall simplification is driving margin expansion. And that's happening independent of what's happening with the royalties. What you're referring to is that we do have 2 important royalties that are going away at the beginning of 2024. The first is on KEYTRUDA. Currently, we pay a 6.5% royalty. That's going to step down to 2.5. And then a few years after that, it will go away. But that big move from 6.5 to 2.5 will have a benefit in the year 2024. nd then separately, we have a 7% global royalty on GARDASIL that goes away at the beginning of '24. So those -- then add on top of what you see is the other benefit we're seeing is the normal shift in our business.”

OptionsHawk Executive Summary & Focus Stocks

Large Pharma had a fantastic 2022 and has traded as a more defensive group while still utilizing firepower to bolster portfolios. **Novo Nordisk (NVO)** has far and away the strongest growth profile, but this appears reflected in the valuation trading at a major premium to the group. **Lilly (LLY)** is also rich in this group with the potential of Mounjaro in type 2 diabetes but recently cut its 2023 EPS outlook. **Sanofi (SNY)** is the clear value buy at 10.25X Earnings while having a balanced growth profile and seeing upward revisions. **Merck (MRK)** would be the top name as you set the strong net income growth at 14.75X Earnings and seeing upward revisions while its transformed portfolio can re-rate shares higher.

Pharma – Animal Health

Components: ELAN, PETQ, ZTS, PETS, HSKA, PAHC, IDXX, WOOF, NEOG

International & Private Peers: Boehringer Ingelheim, Ceva Sante Animale, Virbac, Vetoquinol

Intro

Broadly defined, the animal health industry includes all products and services, other than livestock feed and pet food, that promote livestock productivity and health and companion animal health. These products and services include medicines and vaccines, diagnostics, medical devices, pet supplies, nutritional supplements, veterinary and other related services.

With veterinary volume trends still negative and intensifying macro concerns (particularly in Europe), sentiment among the group has diminished. US vet surveys point to sequentially lighter 3Q demand trends with practitioners expressing continuing concerns over labor constraints and macro. For historical context, with the 2008-2011 economic downturn, veterinary utilization trends in the U.S. were relatively weak, with a sharp decline in veterinary clinic traffic predicated on lackluster pet ownership trends as well as lower patient adherence. The expectation for sustainable heightened growth longer term is based on gradually rising pet ownership globally (albeit at a much more modest pace), higher pet medical spending, and increasing use of more sophisticated therapeutics, diagnostics, technology, and services. Animal Health has increased price above normal levels so far in 2022.

Industry Backdrop & Investment Considerations

Core animal health is an estimated $65 billion market globally ,growing +5-7% annually. The estimated $26 billion companion animal market (dogs, cats and horses) is growing high single digits, with structural tailwinds that include (1) rising pet ownership and (2) increasing spend per pet, as the pet-owner bond strengthens and innovation raises the level of care. The estimated $39 billion production animal market (livestock), growing mid-single digits, enjoys support from the rising demand for protein as global populations expand amidst increasingly scarce natural resources. The top four Animal Health therapeutics manufacturers represent 68% of the market.

The animal medicines and vaccines sector is estimated to represent a global market of approximately $40 billion according to Vetnosis, a research and consulting firm specializing in global animal health and veterinary medicine. Animal health sits at the intersection of two large and growing industry sectors: pet care and livestock production. These three sectors are interrelated. As livestock production and the rate of pet ownership both continue to increase in response to rising demand and increased standard of living, animal health medicines and vaccines will also be needed in greater volumes.

Two defining trends for this group are 1) Increased demand for animal protein, including milk, meat, eggs and fish, challenged by limited new farmland and water, requiring that we produce more food with less resources and 2) Increased companion animal ownership and spending on medicines to help pets live longer, healthier lives.

Consumer spending on pets has increased by ~5% annually over the past 18 years, per APPA, and industry growth reported by the public companies has tended to be in the mid-single digits as well.

Animal Health enjoys healthcare's defensive characteristics without many of the risks associated with reimbursement, third-party payers, generic threats, and research & development inefficiencies.

The positive long-term fundamental drivers of the industry include increased Dx/medication rates and innovative pipelines in the companion animal space. The animal healthcare market expansion will be driven by the increased awareness among pet owners regarding animal health issues.

There has been an ongoing shift of pet Rx market share out of the vet clinic as more consumers choose to fill their Rx at lower-priced online pet pharmacies like CHWY and PETS. Pet owners are spending more per visit and requesting higher-value products and services. The average number of monthly appointments (as tracked by VetSuccess) increased 4.5% in 2020 and is tracking +5.1% YTD. According to IDEXX's June 2021 Pet Owner Research Study, 88% of pet owners agreed that taking care of their pet's health is as important to them as taking care of their own health, and 86% agreed that taking good care of their pet means having regular visits with the veterinarian

Indicators, Metrics & Stock Selection Framework

P/E, Revenue CAGR, EPS CAGR, Debt to EBITDA, EBITDA Margins

Valuation and Comps

Ticker	Company	Mkt Cap	P/E FY1	Net Income CAGR (Fy0-2)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Animal Health				#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
ZTS	Zoetis Inc	71.2B	31.34X	5.80%	7.04%	38.16%	#VALUE!	23.06%	-5.80%	-4.69%
IDXX	IDEXX Laboratories, Inc.	35.0B	53.06X	5.51%	7.14%	29.09%	1.39%	58.36%	-16.07%	-5.42%
ELAN	Elanco Animal Health Inc	6.0B	12.07X	0.89%	-0.08%	17.51%	#VALUE!	3.76%	-14.05%	-7.56%
NEOG	Neogen Corporation	3.3B	######	48.68%	17.97%	4.58%	#VALUE!	6.01%	-113.58%	12.34%
WOOF	Petco Health and Wellness Company	3.2B	13.87X	2.12%	4.32%	5.49%	2.50%	6.54%	-22.92%	4.41%
HSKA	Heska Corp	0.7B	-41.62X	#VALUE!	10.75%	-1.09%	#VALUE!	(0.408%)	-726.00%	-12.15%
PAHC	Phibro Animal Health Corp	0.5B	10.48X	3.62%	3.18%	6.92%	#VALUE!	5.62%	-10.95%	8.25%
PETS	Petmed Express Inc	0.4B	25.21X	-10.37%	5.50%	4.53%	#VALUE!	(13.583%)	-25.00%	-3.56%
PETQ	PetIQ Inc	0.3B	8.72X	15.73%	5.83%	5.26%	#VALUE!	5.1%	12.50%	-5.60%

Management Commentary

Zoetis (ZTS) on trends…. “Overall, positive pet care trends in terms of increasing spend and pet owner demographics continue to underpin the strength of our business. With 10% operational growth in companion animal products in the third quarter, we continue to see strong demand globally for Simparica Trio and other parasiticides, our key dermatology products, Apoquel and Cytopoint, small animal vaccine and monoclonal antibodies, Librela and Solensia. The decline in clinic visits is stabilizing at pre-COVID rates as clinics struggle with capacity issues. That being said, average revenues per visit continue to rise in the U.S. as pet owners plays a premium on the care of their pets, a positive long-term trend. In some of our largest markets like China and Australia, we're seeing our innovative pet care products contributing more and more to growth in these traditionally live stock-driven markets. Meanwhile, our global livestock business performed largely as expected in the third quarter, with a decline of 3% operationally. We continue to face generic competition for livestock products, especially in cattle and poultry, and we face supply constraints in products such as vaccines. However, we are seeing solid pockets of growth, especially in aquaculture and poultry products and certain markets outside the U.S. As we stabilize from the generic competition, and review more consistent supply, we will improve our livestock performance.”

IDEXX (IDXX) on the opportunity…. “We introduced this model last year. It's a $37 billion total addressable opportunity. We think that's very much intact, and I'll share with you some additional insights on that and that with our compelling strategy and executing strongly, we believe that there's an opportunity to grow our top line double digits with increasing profit margins at a high ROIC. Blood work is defined as chemistry and/or hematology. And we said we can grow those clinical visits from where they are today to a much higher rate to this best practice standard. First off, if you take a look at where we sell today, about 2/3 of the served market is in the U.S., 2/3 of the opportunity, the addressable opportunity is outside the U.S. in international regions. So it's exactly opposite. And that speaks to where we think some of the future growth can come from. Will they prioritize spending on pet health care at the expense of other categories, categories they may spend more money on, whether it's travel or entertainment or personal grooming. And what you see from this data is that pet owners said that they are willing to prioritize that this is something that they would cut back in other areas. And in this case, the interesting aspect of this is that the proportion of diagnostics actually grows through the life stages of the pet from about 12% to 20%. So we think that this is, again, a very positive sustaining tailwind to the business.”

OptionsHawk Executive Summary & Focus Stocks

The animal health group is thought to be recession-proof but certainly got whacked hard in 2022 with every name down 30% or more though long-term value is being created into this weakness as multiples compress and estimates come down sharply. **Zoetis (ZTS)** is a best-in-class name, but it falls into the category of still not being a buy at these levels trading 31X Earnings. **IDEXX (IDXX)** trades at an even higher multiple with similar growth and weaker margins, a name that could likely fall further. The small caps in the group are low margin, low growth names so I leave this group not seeing any great investments for 2023.

<u>Pharma– Generic & Specialty</u>

Components: AMRX, BHC, RDY, TEVA, AMPH, EGRX, COLL, PCRX, OPTN, OGN, VTRS, RPRX, LGND, OPK

International & Private Peers: Lupin, Sun Pharma, Sandoz (NVS), Glenmark Pharma, Cipla, Divi’s Labs, Torrent Pharma

Intro

RPRX has potential upside on royalties from Roche's Gantenerumab (Gmab) for Alzheimer's and JNJ's Tremfya for psoriasis/IBD. OGN sees a big opportunity in biosimilars the next few years and Ebopiprant is an oral, selective prostaglandin F2α (PGF2α) receptor antagonist being evaluated as a potential treatment for preterm labor by reducing inflammation and uterine contraction. VTRS announced agreements to acquire 2 ophthalmology franchises, Oyster Point Pharma and Famy Life Sciences with the deals expected to close in 1H23. OYST's first commercially approved product Tyrvaya (varenicline solution) was approved in October 2021, and the company has 3 pipeline assets (One Ph2 (4Q22), two pre-clinical (2H22) assets). The company plans to divest 1) its OTC business, 2) women's healthcare 3) API manufacturing (retaining select capabilities), and 4) some smaller geographies. TEVA management continues to believe growth should improve in the out-years as Austedo/Ajovy ramp, the drag from Copaxone lessens, and biosimilar launches ramp. AMRX is focused on the launch and ramp of new products including Alymsys, vasopressin, and Zafemy.

Industry Backdrop & Investment Considerations

Generic drugs are bioequivalent to branded medications in terms of their strength, dosage, quality, form, intended use, side effects, route of administration and pharmacological effect. The global market for generic drugs should grow from $411.6 billion in 2020 to $650.3 billion by 2025 at a CAGR of 9.6% through 2025. In recent years, there has been a rise in the number of generic drug approvals across the US supported by the implementation of the Drug Competition Action Plan of the FDA that aims towards the elimination of barriers faced by the generic-drug manufacturers.

Biosimilars on the US market have achieved average sales share of 29%, though it is still early in the market's evolution as half of the biosimilars have been marketed for less than a year. Success so far has been mixed and appears dependent on a first-mover advantage as well as how the innovator responds to competition. Going forward, there are over 70 new biosimilars in development in the US, which could result in additional competition coming to market and further pressure on pricing beyond the over 20% average discount (on ASP pricing) offered by biosimilars relative to the brand drug.

Indicators, Metrics & Stock Selection Framework

P/E, EV/Sales, Revenue & EPS CAGR, EBIT Margins

Valuation and Comps

Ticker	Company	Mkt Cap	P/E FY1	Net Income CAGR (Fy0-2)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Generic and Specialty				#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
RPRX	Royalty Pharma plc	25.6B	11.66X	26.04%	-5.30%	33.62%	#VALUE!	14.14%	17.26%	21.95%
VTRS	Viatris Inc	13.5B	3.30X	-6.37%	-3.24%	34.70%	#VALUE!	10.14%	-1.74%	-5.48%
TEVA	Teva Pharmaceutical Industries Ltd (A	9.4B	3.44X	-5.04%	1.77%	27.18%	#VALUE!	8.9%	-4.21%	-4.13%
RDY	Dr Reddy's Laboratories Ltd (ADR)	8.9B	1711.54X	22.47%	9.70%	24.23%	#VALUE!	9.54%	23.60%	10.69%
OGN	Organon & Co	7.0B	5.44X	-10.10%	1.95%	20.88%	1029.73%	25.61%	-21.45%	-1.12%
BHC	Bausch Health Companies Inc	2.8B	2.56X	-7.73%	3.25%	34.31%	#VALUE!	6.99%	-34.26%	-5.69%
PCRX	Pacira Biosciences Inc	2.1B	16.67X	24.16%	13.96%	29.13%	#VALUE!	12.56%	-32.51%	-7.63%
AMPH	Amphastar Pharmaceuticals Inc	1.4B	17.47X	30.51%	8.32%	23.24%	#VALUE!	18.08%	4.79%	1.18%
LGND	Ligand Pharmaceuticals Inc	1.1B	15.28X	-40.89%	-35.86%	28.67%	#VALUE!	9.92%	-27.55%	-21.39%
OPK	Opko Health Inc.	1.0B	-2.80X	#VALUE!	-13.46%	-48.85%	#VALUE!	(1.808%)	113.64%	-15.92%
AMRX	Amneal Pharmaceuticals Inc	0.7B	3.71X	39.26%	5.79%	14.79%	#VALUE!	8.95%	-23.29%	-0.24%
COLL	Collegium Pharmaceutical Inc	0.7B	-32.51X	142.75%	19.94%	16.11%	#VALUE!	29.52%	-112.65%	-1.89%
EGRX	Eagle Pharmaceuticals Inc	0.4B	4.13X	23.22%	-15.46%	29.33%	#VALUE!	31.22%	-28.30%	-24.20%
OPTN	OptiNose Inc	0.1B	-2.00X	-33.94%	16.03%	-53.79%	#VALUE!	913.28%	18.67%	-23.00%

Management Commentary

Royalty Pharma (RPRX) on collaborations, development and its model…. "Second, we have announced transactions of $3 billion year-to-date, including our innovative R&D fund in collaboration with Merck. This is an exciting model for future potential partnerships with large biopharma, and Marshall will expand on this later. More broadly, our overall rate of capital deployment reflects the strong demand for innovative royalty-based funding solutions. We have a deep development stage portfolio with 13 new molecular entities and approximately 40 projects in late-stage development, impressive figures, which rival many large biotech companies. For Royalty Pharma, our investments will generally be validated by the successful development and commercialization of the said therapies on which we have royalties. And in certain cases, such as Immunomedics and Biohaven by the accelerated returns we achieved for our shareholders resulting from their acquisitions by larger biopharma companies. This biotech funding model using a variety of sources of capital includes royalties has proven to be successful for our partners, and we believe should represent the new funding model but the most successful biotech use in the future."

Viatris (VTRS) on Phase 2 of its transformation…. "It is about building a rock-solid foundation setting us up for Phase 2, which is expected to be a period of renewed growth and leadership in our sector. Third, we paid down $4.2 billion in debt since the beginning of 2021 and are on track to paying down at least $6.5 billion by the end of Phase 1. And lastly, we returned capital to shareholders beginning in 2021 with our inaugural dividend, growing the dividend by 9% in 2022 given our strong cash flow generation and plan to add to such return through the execution of our share repurchase plan. But first, while we will remain therapeutic-agnostic overall, we announced this morning 2 acquisitions consistent with one of our previously announced therapeutic areas of emphasis: ophthalmology. We anticipate the combined assets of these acquisitions to add to the top line immediately and grow in strong double digits from there, potentially reaching to at least $1 billion in sales by 2028. Furthermore, given that we believe that our shares are significantly undervalued, our view is that, in addition to investing in growth assets, repurchasing our shares is another one of the best uses of our cash. Therefore, we intend to increase our return of capital to shareholders not only through the continuation of our dividend, but also following the receipt of the proceeds of the Biocon Biologics transaction, we intend to begin executing in 2023 on the $1 billion stock repurchase program authorized by our Board of Directors earlier this year. Similar to our biosimilars transaction, we believe some additional benefits of divesting these noncore assets are reduced SG&A costs, reduced capital expenditures, and the aggregate average gross margin profile of these assets is lower than the company's current gross margin as a whole."

Organon (OGN) on Fertility markets…. "This was also the first quarter during which we delivered more than $150 million of NEXPLANON in the U.S., where the product grew 26%, and that is driven primarily by increased physician demand. Fertility also grew double digits during the quarter as well as year-to-date. We expect double-digit performance for this portfolio for the full year 2022. The U.S. and China are large and important fertility markets and together represent over half of our current fertility business. Revenue increased in both of those markets during the third quarter, and that was despite slower-than-expected recovery from the COVID lockdowns in China. China is a particularly important fertility market with over 1 million IVF cycles a year, that is 5x the number of cycles in the U.S. As you've heard us discuss many times before, fertility is a therapy area with strong demographic tailwinds. Women are waiting longer to start a family, resulting in higher infertility prevalence, and more governments are realizing that they need to take action to address the associated low birth rates. Globally, the top 5 markets with the highest infertility rates are in the Asia Pacific region, where the fertility rate or the number of births per woman is significantly below the replacement rate required to sustain a population and a GDP growth."

OptionsHawk Executive Summary & Focus Stocks

Viatris (VTRS) looks interesting in this group as a deep value play while making a lot of moves to change its portfolio of assets. **Dr. Reddy (RDY)** looks attractive at 11X EBITDA while being the strongest grower of the large gaps and seeing estimates steadily rise. **Amphastar (AMPH)** is the small cap catching my eye at 17.5X Earnings with 30% operating income growth, solid margins, strong FCF and positive revisions. AMPH has a pipeline of difficult to develop complex generics and one of the most unique names in the space.

Pharma – Drug Distribution

Components: ABC, CAH, MCK

International & Private Peers

Intro

Distributors were some of the top performers in 2022 and script utilization trends point to continued momentum. The upcoming flu season is widely expected to be notably more severe than those of the past decade, which could serve as an incremental tailwind. Drug distributors are seeing improving utilization trends, durability in varying economic backdrops, and continuing Specialty drivers with a building multi-year biosimilars opportunity.

The 2023 US launch of Humira biosimilars promises to alter the drug supply chain. Specialty pharmacies owned by Cigna and CVS emerge as clear beneficiaries. Distributors will not see much benefit until 2025 because ~ 78% of the near-term pipeline of biosimilar launches is comprised of products dispensed through specialty pharmacies and not physician offices, which are the distributors' sweet spot.

Industry Backdrop & Investment Considerations

Pharmaceutical distributors are at the heart of the US health care ecosystem. Distributors handle 92 percent of pharmaceutical sales and add efficiency and order to a supply chain that connects two highly fragmented markets: 1,300 manufacturers and 180,000+ points of dispensation.

The industry is extremely concentrated with the big three (MCK, ABC, CAH) accounting for more than 90% of industry revenues. Importantly, these predominantly domestic facing businesses do not face many of the risks shared amongst the rest of pharma/biotech (e.g., patent cliff, litigation, safety concerns).

Complementary businesses provide diversification and alternative growth opportunities amidst a more challenging outlook for core distribution. The Specialty market, in particular, represents an important alternative opportunity for the distributors. Specialty drugs (e.g., treatments for cancer, Hep C, rheumatoid arthritis) are becoming an increasingly large part of total pharmaceutical spend. Other complementary businesses include Med-Surg, Medical Technology, and the International market.

Margins for the distributors hover in the low single-digit range; however, the industry in aggregate has experienced steady increases due in part to diversification into higher margin businesses as well as gains derived from enhanced purchasing platforms. Importantly, annual cash generation is robust, with relatively low capex and effectively zero R&D requirements, which allows for a high amount of flexibility to pursue shareholder-enhancing initiatives/M&A.

Favorable trends include innovative therapies, shifting sites of care, aging population, value-based care, and digitization of healthcare.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, P/E, EPS CAGR, EBITDA Margins, FCF Yield, ROIC; Script Utilization Trends

Valuation and Comps

Ticker	Company	Mkt Cap	P/E FY1	Net Income CAGR (Fy0-2)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Drug Distributors				#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
MCK	McKesson Corp	53.6B	15.24X	1.74%	3.64%	1.66%	6.18%	589.53%	3.77%	5.43%
ABC	AmerisourceBergen Corp.	33.8B	14.57X	4.13%	5.30%	1.21%	6.06%	58.23%	6.17%	5.98%
CAH	Cardinal Health Inc	20.5B	14.71X	2.88%	6.30%	0.85%	5.72%	49.49%	0.19%	13.07%

Management Commentary

McKesson (MCK) on medical-surgical segment strength and Oncology….. "In addition to pharmaceutical distribution, we also have sustainable core distribution assets in the Medical-Surgical segment. In the second quarter, segment adjusted operating profit grew 7% when excluding the impact of COVID-19-related items. The solid performance is primarily driven by our scale and reach across the alternate site market. Through years of intentional investment and expansion, the Medical-Surgical segment has established market-leading positions in the primary care and extended care markets. Following the needs of the patients, we're also expanding our services to other channels such as government, consumer and direct-to-home markets. We continue to build out one of the largest, most tenured sales forces in the industry. The oncology ecosystem is expanding and becoming an increasingly important driver for the growth of the U.S. Pharmaceutical segment. Our leading market position in community oncology distribution allows us to capture the growing market opportunity driven by a strong pipeline in drug launches."

AmerisourceBergen (ABC) on Biosimilars….. "But on the legacy specialty business, let me just say, we've always adapted the business for the needs of both large and small customers. If you look at the market shares we have considering that a good portion of the market in community oncology in the U.S. which is where our biggest business is, is not available to us. The market shares we have are pretty impressive, and we've maintained them those relationships for a long time. And we do that with exceptional service, pricing and strong relationships on the ground. And you asked about biosimilars. We are going to be working hard on both Europe and the U.S. to help our customers access them to access them profitably, to access them on behalf of their patients. I think we've already demonstrated tremendous success. And our sweet spot is, again, like it was with the generics 2 to 4 players, we do best, and once it gets too much beyond that, it's -- the reimbursement declines a lot for our customers. And we really are evaluating the shifts and what makes clinical and economic sense for our customers. But it's been a tremendous -- it creates a lot of headroom for our suppliers and for actual drug spending, which we believe is the most efficient form of healthcare."

OptionsHawk Executive Summary & Focus Stocks

Top pick from last year **McKesson (MCK)** climbed 50% in 2022 and this group overall had a fantastic year while remaining relatively cheap to the market on valuation despite upside growth levers. **AmerisourceBergen (ABC)** lagged the group in 2022 but looking forward screens the cheapest despite the strongest growth outlook and highest upside revisions and it has strong positioning in specialties and the upcoming biosimilar wave.

Labs & Diagnostics – CRO & Pharma Services

Components: IQV, LH, DGX, ICLR, CRL, MEDP, SYNH, SHC, FLGT, HLTH, NOTV

International & Private Peers

Intro

In Labs, investors are concerned with core utilization trends and cost inflation while post-COVID benefits are diminishing. Base utilization trends, which matter most to investors, continue to be inversely correlated with COVID cases and testing.

In CROs, biotech customer spending trends and capital market activity remain fairly strong while there is some concern with softer B2B. Clinical CRO ability to pass through price increases in ’23 and protect margins in light of continued inflationary pressures is a key focus point into next year. MEDP reported a robust top-/bottom-line beat this quarter, exhibiting strong y/y growth to backlog and net new business awards. Issues such as Big Pharma consolidation and the looming 2012 patent cliff that hurt early-stage CROs in 2009-2010 are unlikely to repeat, resulting in less downside risk in 2023-2024. Biotech’s remain well-funded with ample balance sheets, and strong pipelines in novel modalities is resulting in strong order funnels for most CROs. For CDMOs, fears of a “COVID vaccine cliff” and over-capacity continue to overhang the sector. Still, non-COVID demand remains robust, and expectations & valuations have reset lower in recent months.

Industry Backdrop & Investment Considerations

Clinical diagnostics laboratories analyze biological samples from patients and a group divided into clinical reference labs, specialty/esoteric test labs, and suppliers to these labs. The US clinical reference lab testing market is $80B with $30B for hospital inpatients and the remaining outside the hospital. Quest (DGX) and Lab Corp (LH) combine for around a 50% market share with the rest independent and regional players.

The CRO industry is estimated to be $45B and highly fragmented with over 1,000 entities globally, though relatively few of full scale and breadth of service. The CRO market is estimated to reach $62B by 2027 according to Grandview Research at a 6.6% CAGR. Consolidation in the space is relatively common and recent M&A among CROs has been around building out capabilities either in data analytics (Quintiles / IMS Health, PRAH / Symphony), key CRO functions such as patient recruitment (PPD / Acurian), site management (Parexel / Fomativ, PPD / Synexus) or preclinical services (Charles River). The CRO industry is expected to grow ~6%, driven by ~2%-3% from increasing R&D spending by the biopharma industry and ~3% from increased penetration of drug development budgets.

A number of positive trends are working in favor of these names including rising Biopharma R&D Spend, Prescription Drug Sales Growth, Biotech Growth, Biotech Financing Strength, Increasing Drug Pipelines, Increased Novel Drug Approvals, and Increasing Clinical Trials.

Several key trends that are driving positive CRO industry growth include robust R&D funding, accelerated drug approval rates, growing number of pipelines in preclinical and clinical development, and the proliferation of biopharmaceutical companies without internal research and clinical capabilities. R&D outsourcing penetration to CROs will continue to grow as a % of overall R&D spending as CROs demonstrate their value proposition to its biopharma counterparts. CROs have the ability to reduce time to market for a drug via expedited patient recruitment for clinical trials, regulatory expertise, and network selection criteria, all while reducing the cost of clinical trials for biopharma companies. Current outsourcing penetration is between 45-50%, with potential to reach 70-75% long-term.

Indicators, Metrics & Stock Selection Framework

EV/Sales, EV/EBITDA, Revenue and EPS CAGRs, ROIC, FCF Yield, EBITDA Margins, DSO

Book to Bill Ratios is one key performance indicator used for this group. R&D spend in the Biopharma industry continues to be a positive tailwind for the group. Accounts receivable is a key balance sheet metric for CROs, and high days sales outstanding may be attributable to late payment collection or early revenue recognition.

Some companies report gross bookings and cancellations, while others report only net bookings (gross bookings, less cancellations). Backlog is also an important indicator and backlog conversion measures the rate at which a company converts its backlog into recognized revenue and is calculated by taking the current period's net service revenue as a percentage of backlog at the beginning of the period. There is a strong documented correlation between ROIC and valuation for CROs, suggesting investors are focused more on true economic returns. We also want to look at SG&A as a % of Sales, and R&D metrics.

Valuation & Comps

EV/EBITDA to ROIC

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
CRO and Pharma Services					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
IQV	Iqvia Holdings Inc	40.3B	15.35X	10.52%	7.57%	19.34%	3.94%	10.41%	-0.20%	-3.20%
LH	Laboratory Corp. of America Holdings	20.2B	8.44X	7.09%	0.44%	16.34%	7.35%		1.59%	-2.61%
DGX	Quest Diagnostics Inc	17.1B	9.73X	5.53%	-7.32%	17.02%	7.62%	15.83%	8.84%	5.18%
ICLR	ICON PLC	16.1B	13.97X	10.29%	5.35%	#VALUE!	3.41%	9.45%	-0.44%	-2.15%
CRL	Charles River Laboratories Intl. Inc	10.7B	13.32X	12.37%	6.04%	20.36%	3.29%	12.02%	-6.58%	-2.72%
MEDP	Medpace Holdings Inc	6.6B	21.79X	15.36%	16.65%	20.28%	4.17%	35.67%	24.80%	2.48%
SYNH	Syneos Health Inc	3.6B	7.75X	5.77%	-2.67%	14.08%	10.36%	7.77%	-8.24%	-6.21%
SHC	Sotera Health Co	2.5B	8.12X	9.73%	7.87%	36.45%	#VALUE!	10.98%	-2.60%	-1.45%
FLGT	Fulgent Genetics Inc	1.0B	0.35X	(46.756%)	-57.31%	10.98%	#VALUE!	68.68%	-13.85%	2.16%
HLTH	Cue Health Inc	0.5B	-1.10X	(31.832%)	-27.11%	-96.87%	#VALUE!	64.98%	-267.71%	-37.56%
NOTV	Inotiv Inc	0.1B	4.25X	25.58%	6.28%	5.59%	#VALUE!	(8.661%)	33.49%	17.02%

Management Commentary

IQVIA (IQV) on Biotech funding environment….. "Well, I think we have to put the drought in perspective. We had $16 billion in overall funding of emerging biopharma according to BioWorld, which is the source we follow, that follows both public and private funding of emerging biopharma. And that was the highest quarter of the year. And if you annualize the first 3 quarters, you get to about $60 billion or so of funding for the year. Now that looks small in relation to '20 and '21, but those were outsized blowout years. $60 billion is more or less in line, if not slightly higher than the pre-pandemic level. So I don't think there's been a big crisis. There's just been the inevitable slowdown after a big jump there. Now look, a lot of the emerging biopharmas we deal with are still very well funded. We -- and we tend to be a little bit later stage in some of our competitors that have talked about the slowdown in the sector. We tend to do more Phase II, Phase III trials. We don't do first-in-human work for the most part. Our exposure to pre-commercial emerging biopharma is comparatively small, 10% or slightly less of our backlog and RFP flow. And the clinical trial business is pre-commercial EBP. And keep in mind that the clinical trial business is 55% of IQVIA's overall business. You have another 45% that's commercial, so post commercial by definition. And we're also very careful about the clients we take on. So historically, we do a very, very thorough credit check. So we haven't seen that much of a slowdown at all. I mean, it's not to say it couldn't happen. We just haven't seen it yet. So we're keeping our eyes out for it. We always ask about it. Are you seeing any slowdown in projects coming through, customer decisions, increased bad debt, anything like that? With the exception of maybe China where there's COVID-related issues that have affected funding a little bit more, and we actually see that starting to come back now, really no impact."

Lab Corp (LH) on business trends….. "If I look at our diagnostic underlying business, the trends look really strong. And the Base Business has come back really well. If you look at Drug Development, the fundamentals remain very strong, whether it's the book-to-bill, the number of RFPs, our win rate of RFPs. The underlying fundamentals of our Drug Development look well. Now there's been some real macro issues that we've had to face, whether it be Russia-Ukraine, whether it be inflation, whether it be the ability to forecast as we've gone through COVID and looking at the COVID-related work. But if you look at the volume, the volume has come back. It's not yet at prepandemic levels. It's just above prepandemic levels, but it's not yet as strong as we would have expected if there wasn't COVID. But the good news is each quarter, it continues to improve. We're seeing very strong improvement in the fourth quarter versus the third quarter. So there's no doubt in my mind that, that business is coming back, that the fundamentals are strong and that the volume will be back to prepandemic levels with the growth that we would have expected as we go through next year. So we've seen strong performance in both routine and esoteric testing. Esoteric testing has grown a bit faster than the routine. So you've seen a slight change in our mix, but no trend changes or anything like that. Those businesses are coming back well. We don't typically do a lot of business in flu, frankly, in the past. A lot of flu tests are done in a doctor's office, and they'll test patients there. It's never been a significant amount of business for us."

Charles River (CRL) on room for further growth….. "I think actually, the end markets are very robust in all of our businesses. We -- there's still a tremendous amount of headroom I would say, for growth. Our addressable market is probably north of $20 billion. And we enjoy #1 and #2 positions, leadership positions in most of the markets in which we compete, which is a good place to be when you were that thought leader, thought partner to your clients. If I break it down by our segments, if you think about the DSA space, in safety, about 60% of the market is outsourced. So there's still headroom for additional growth. And we have about a 35-plus market share. And so while that's double our nearest competitor, there's still headroom, again, to continue gaining share in that market. In our RMS segment, we are really pleased with what Jim, our CEO, has been calling the renaissance of RMS. That was a slower growth end market that tended to be more in the sort of low single-digit growth space. And we're clearly seeing it now accelerate to high single digit. And it actually has been driven by different components of RMS business. And then you round that up with differentiated services like GEMS, our genetically engineered models. It really is broadly based and very robust. And then in manufacturing, we also continue to see strong performance in the end markets for both Biologics and Microbial. And we are very excited with our decision over the last couple of years to enter into the CDMO space with a focus on cell and gene therapy."

OptionsHawk Executive Summary & Focus Stocks

The Labs plays continue to face tough comps and have very little top-line growth seen ahead but valuations are around 9X EBITDA, putting them into the deep value buy zone with 8X to 11X the historical norm. **Quest (DGX)** is the preferred of the two with most metrics similar and it carrying stronger FCF and margins. Of the three large cap CROs, **Iqvia (IQV)** screens most attractive at 15X EBITDA with double digit growth, strong margins and resilient earnings. **Medpace (MEDP)** annually screens as a small cap star and coming off an impressive quarter while insiders bought the 2022 weakness, a name that carries a premium valuation but also is the industry-best across every metric.

<u>Labs & Diagnostics – Life Science Tools</u>

Components: TMO, DHR, A, ILMN, MTD, WAT, PKI, AVTR, TECH, BIO, BRKR, RGEN, STVN, HAE, TXG, ABCL, AZTA, OLK, CTKB, PACB, CERT, ME, CYRX, SLP, BLFS, SLGC, SEER, MASS, NSTG

International & Private Peers: F. Hoffman-La Roche AG, Merck KGaA, Shimadzu, Hitachi, Zeiss

Intro

In Tools, with the base case expectation of a broader and deeper recessionary environment and continued geopolitical and macro headwinds as a backdrop for '23 the stable growers are likely to outperform smaller peers. The focus remains on the balance between growth and cash burn for many of the early stage / pre-profitable companies. The market is still underestimating the impact of the Tools' pricing power and the price hikes they have already made, which may not have been fully realized in top line growth and if inflation recedes it could be a significant driver to margin expansion. The Tools companies have steadily increased their biopharma revenue exposure since the last recession in 2008-2009, augmenting a defensive revenue stream which often comes with a high level of recurring revenue. At the same time, the Tools companies have benefited from a significant increase in R&D finding from both existing large cap Pharma companies as well as emerging biotech's.

Industry Backdrop & Investment Considerations

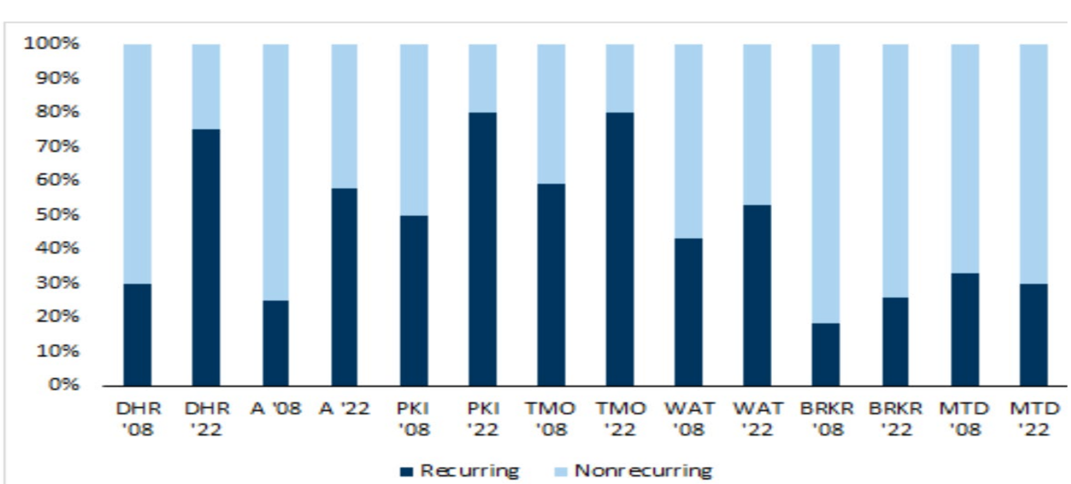
The $95B LST market is seen growing at a 12% CAGR through 2028 attributed to rapid technological advancements adopted by the life science tools companies in mass spectrometry, sequencing technologies, chromatography methods, NMR, and other products. Secular tailwinds include innovative drug discovery/development within biologics and increased government funding.

The life science tools segment consists of a few large players and then some small niche growth names. The group covers technologies such as genomics, cell biology, proteomics, lab supplies and analytical technology. The end-users generally consist of Biopharmaceutical companies ($25B), Government/Academic ($23B), Industrial ($14B), & Clinical/Labs ($27B). Thermo Fisher is one of the largest players and estimates a $165B addressable market across these four groups growing at 3-5% annually. The companies often break up products into Instruments/Software, Consumables, and Services.

The group is characterized by broad end market exposure, diversified geographically, and a high mix of recurring revenues via a razor / razor blade model. Overall, it is a strong business and with growth drivers including genomics and the proliferation of personalized medicine, regulatory trends with increased food and environmental testing, innovation and spending in China, and consolidation.

Life Science Tools and CROs have demonstrated the ability to drive margin expansion through cost reductions, pricing power, sourcing initiatives, and most significantly via strong operating leverage. These stable organic growth trends coupled with improving profit margins has resulted in solid FCF generation, which has allowed industry players to advance research, clinical, and drug development technology, expand their breadth of product offerings, catalyze industry consolidation through M&A, and return cash to shareholders.

Recurring vs. Nonrecurring Revenue in 2008 vs 2022

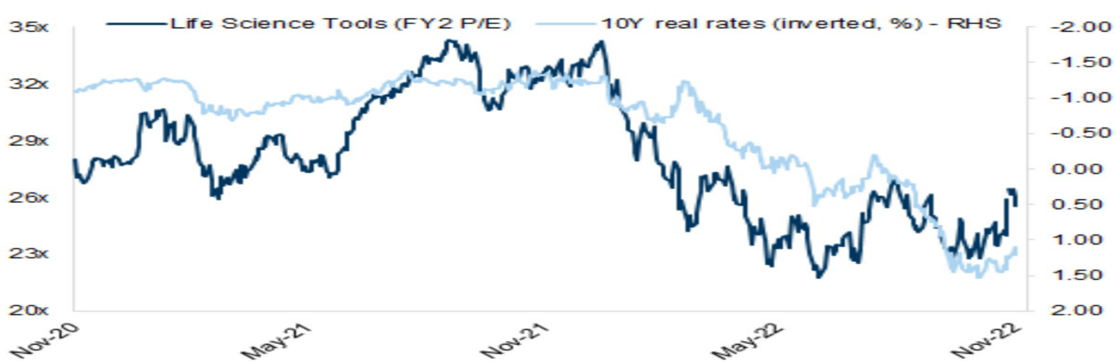


The drug discovery and manufacturing market is a key driver of growth for the Tools sector. Global drug sales have grown by nearly $200bn over the past decade fueling growth in R&D as the cost of developing a drug has tripled over that same time period. BioPharma is the largest and fastest growing end market for the Tools sector. Drug discovery remains a key driver of organic growth for pharmaceutical companies. Bioprocessing, Proteomics and Synthetic Biology are three attractive end markets within the overall Life Science Tools industry representing significant TAMs and exceptional growth rates. Like most fast growing markets, they are also attracting investment and competition. One intriguing growth area is the bioprocess supply market at ~$15B growing in the low-to-mid teens, with leading players Danaher (DHR), Merck KGaA (MRK GY), Thermo Fisher Scientific (TMO), Sartorius (SRT3 GR), and Avantor (AVTR) comprising about ~80% of the market.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EV/Sales, EBITDA and Revenue CAGR, EBITDA Margins, ROIC, FCF Yield, Debt to EBITDA

Organic growth and consistent margin expansion are the two most important fundamental drivers for sector returns. Accelerating revenue trends have been a key driver of share price performance for the sector. In Dx, gross margin expansion can provide a view on the efficiency of manufacturing and the sustainability of the longer-term revenue model.



Valuation & Comps

EBITDA CAGR to P/E

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Life Science Tools					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
TMO	Thermo Fisher Scientific Inc.	222.6B	21.01X	11.16%	0.49%	22.20%	2.98%	16.7%	2.36%	4.22%
DHR	Danaher Corporation	199.1B	20.31X	8.58%	-0.07%	31.01%	3.81%	11.65%	0.49%	-0.65%
A	Agilent Technologies Inc	45.8B	22.25X	9.3%	7.07%	28.77%	2.90%		16.00%	4.01%
MTD	Mettler-Toledo International Inc	33.1B	28.33X	6.66%	1.54%	31.16%	2.31%	48.68%	1.77%	-1.54%
ILMN	Illumina, Inc.	32.8B	48.87X	30.5%	9.66%	9.15%	1.00%	11.68%	-41.43%	-12.57%
WAT	Waters Corporation	20.2B	21.04X	7.0%	3.27%	27.74%	2.95%	54.64%	0.14%	0.62%
PKI	PerkinElmer, Inc.	18.7B	15.70X	7.79%	-21.10%	31.44%	4.16%	15.35%	-27.50%	2.35%
AVTR	Avantor Inc	14.8B	13.22X	7.04%	-0.53%	15.51%	5.33%	10.68%	-7.68%	-6.20%
TECH	BIO-TECHNE Corp	13.0B	27.58X	16.97%	13.27%	29.69%	2.64%	15.66%	6.38%	9.52%
BIO	Bio Rad Laboratories Inc	13.0B	19.35X	14.28%	3.19%	15.54%	#VALUE!	4.22%	3.95%	-2.79%
RGEN	Repligen Corporation	9.9B	38.39X	29.87%	0.82%	28.97%	0.43%	14.27%	-2.61%	-2.46%
BRKR	Bruker Corporation	9.9B	18.37X	9.44%	3.64%	22.41%	#VALUE!	24.17%	10.53%	3.53%
AZTA	Azenta Inc	4.6B	38.69X	52.06%	12.33%	1.50%	1.53%	#######	-35.08%	-6.47%
STVN	Stevanato Group SpA	4.5B	16.49X	13.69%	7.84%	20.02%	-2.99%	19.58%	6.00%	2.59%
HAE	Haemonetics Corporation	4.1B	16.38X	12.29%	0.29%	20.37%	#VALUE!	10.56%	16.03%	16.08%
TXG	10X Genomics Inc	4.0B	-22.64X		21.13%	-30.51%	#VALUE!	#######	96.39%	-17.56%
ABCL	AbCellera Biologics Inc	2.9B	7.92X	22.42%	-77.06%	37.22%	#VALUE!	38.93%	300.00%	112.79%
OLK	Olink Holding AB (publ) - ADR	2.8B	-121.23X	684.66%	44.24%	-25.08%	#VALUE!	(9.441%)	-50.00%	46.14%
CERT	Certara Inc	2.7B	23.92X	15.89%	13.19%	37.87%	3.47%	2.58%	-12.20%	-6.94%
PACB	Pacific Biosciences of California Inc	2.2B	-7.61X	(17.784%)	37.10%	#######	#VALUE!	#######	6.18%	-21.49%
CTKB	Cytek Biosciences Inc	1.5B	51.89X	51.62%	28.98%	14.59%	#VALUE!	38.42%	30.43%	33.57%
ME	23andMe Holding Co.	1.4B	-3.58X	4.81%	4.07%	-89.93%	-15.33%	#######	51.05%	0.37%

Management Commentary

Illumina (ILMN) Analyst Day on next-generation sequencing, proteomics and other growth areas…"Next-generation sequencing represents a $120 billion market opportunity, one that we're still in the very early stages of penetrating. Our strategy is to leverage our proprietary innovation to deliver NGS platforms and select applications to accelerate the penetration into this market and catalyze new, large adjacent NGS markets. Today, only 4 million people, that's 0.07% of the world's population ever had their genome sequenced, even once. We'll go from this to over 1 billion people being sequenced dozens of times over their lifetime. In proteomics, we're collaborating with multiple players to accelerate the use of proteomics by leveraging NGS as a high-throughput readout platform. This includes our co-development work with SomaLogic on a proteomic assay that's on track to launch in 2024. This strategy has enabled us to deliver strong and profitable growth. For core Illumina, this represents a 14% CAGR for revenue and a 15% CAGR for operating profit in the last 5 years. Oncology is the biggest opportunity, and a lot of what I've talked about so far with AJ and others is using genomics to inform treatment decision. Monitoring is another very exciting area that we'll see grow over time. Natera has been out there doing whole exome on the tumor and then doing a specific PCR-based assay. So when does it launch? When is it available and in what models? I mentioned the NovaSeq X, which is going to have a list price of $985,000. It's basically what NovaSeq 6000 is. NovaSeq Xplus, which is $1.25 million. The first product that we'll launch is in NovaSeq Xplus in Q1 of next year, we expect about February when we're shipping product and then the NovaSeq X will come in the second half of the year."

Thermo Fisher (TMO) on growth, product launches and market share….. "he product launches this year have been truly outstanding, and the pipeline, it looks fantastic. The new capabilities that we have invested in have meaningfully strengthened our unique customer value proposition, and our customers are continuing to expand their relationship with us. All of this is enabling us to deliver industry-leading core growth. The higher outlook primarily reflects the strength of our core business and a modest impact of additional COVID-19 testing. These are more than offsetting the increased foreign exchange headwinds and demonstrate how well we're operating with speed at scale to enable our customer success. Our business is performing very well, and markets continue to be strong. We're gaining market share. We're seeing the benefits of our accelerated investments in innovative new products and enhanced capabilities and capacity. In addition, our clinical research business has delivered excellent results, and customers are valuing the benefit of our expanded offering."

Danaher (DHR) on how its growth rerates higher…. "Well, let's have a look at the left here, where you see Cytiva and Pall together representing a $7.5 billion bioprocessing franchise growing high single digits for the long term. You see Cepheid, more than 10% of our future portfolio growing low double digits. You see our differentiated genomics franchise, consisting of IDT and Aldevron at $1 billion plus growing well into the low double digits. You see our life science instruments and clinical diagnostics businesses in which we have invested aggressively to accelerate growth through innovation and improve commercial execution growing at mid-single digits and plus. And all that comes together to re-rate our long-term growth -- core growth to high single digits. Now when you combine that with our discipline and the power of the Danaher Business System and our bias to deploy capital towards M&A, you see the leverage that, that provides to double-digit earnings growth. So simply stated, our outstanding portfolio, combined with the power of DBS, really accelerates our growth and earnings trajectory for the long term."

OptionsHawk Executive Summary & Focus Stocks

Thermo Fisher (TMO) and **Danaher (DHR)** both fall into the high-quality but still may need to see estimates come down a bit and are lacking topline growth. **Agilent (A)** is the preferred 2023 name firing on all cylinders and the most attractive growth outlook. **Illumina (ILMN)** is a product cycle play that could see momentum pick up though at 49X EBITDA it is tough to own. **BIO-TECHNE (TECH)** remains a favorite with stellar growth and margins though you are paying a bit of a premium. **Repligen (RGEN)** has long been a top growth name but topline is slowing and trades at a sky-high 38X multiple, so a candidate for multiple compression. **Bruker (BRKR)** at a $10B market cap is another I would put with the favorites on well-balanced valuation/growth. Looking through the smaller names **Azenta (AZTA)** is interesting coming off a blowout report and is buying back a large percentage of its market cap that should provide a strong floor. **Stevanto (STVN)** at 16.5X an attractive growth name with rising estimates and **Cytek (CTKB)** a rapid growth name but trading at premium valuation. **Pacific Bio (PACB)** is a small cap entering a strong product cycle and should have a strong 2023. **Olink (OLK)** is a speculative rapid growth I would highlight as a play on the proteomics space. **Simulations Plus (SLP)** would be the M&A pick with solid growth and positively inflecting profitability. **Haemonetics (HAE)** a potential larger acquisition target as it remains cheap and estimates are being sharply revised higher for earnings and revenues.

Labs & Diagnostics – Diagnostics

Components: QGEN, EXAS, QDEL, GH, NTRA, MRVI, ABCM, BEAM, TWST, VCYT, MYGN, VIVO, ADPT, RDNT, NEO, CDNA, MXCT, CSTL, NVTA, SRDX, QTRX, OSUR, QTNT

International & Private Peers

Intro

In Diagnostics, given the unpredictable nature of COVID testing, most companies have embedded de-risked 2H/'23 COVID testing expectations. Persistent pressures remain such as continued lockdowns in China, unfavorable currency moves (stronger USD) that accelerated during 3Q, inflation and supply chain challenges, and a rising rate environment that will impact companies with floating rate debt.

As the competitive landscape intensifies over the next few years the Dx sector is in the midst of a shift towards the value of infrastructure, where the institutional knowledge and experience of the development, sales and marketing, approval and reimbursement of a diverse set of diagnostic tests will be seen as a competitive advantage. Accelerating revenue trends have been a key driver of share price performance for the sector. While benefiting from the base effect in the early years, many of these companies have continued to surpass revenue expectations as test volumes and adoption of molecular and genetic diagnostics takes hold. Investor attention has been largely focused on gross margins as a measure of potential profitability understanding that investment in SG&A and R&D are necessary to fuel future growth.

Industry Backdrop & Investment Considerations

The CMS projects that national health spending will grow at an annual average rate of 5.4% from the 2019-28 period reaching $6.2trn, representing 19.7% of GDP in 2028. Spend by those over 65 has been nearly 5 times higher than spending per child ($19,098 vs $3,749) so as the population ages in the US and globally the tailwinds for increased healthcare spend should continue to benefit the Dx sector.

The overall global diagnostics market is estimated to be valued near $55B with POC diagnostics at $14-$15B.

Diagnostics is also a strong area with multiple secular tailwinds and seeing accelerating revenue growth and margin expansion with plenty of innovation although we saw multiples compress in 2022 as the competitive landscape intensifies and long duration / high valuation stocks came under pressure.

Liquid biopsies have multiple applications and are a mega-trend for at least the next decade as precision diagnostics are booming. Diagnostics represents only 2-3% of US healthcare spending yet informs ~70-80% of all healthcare decision-making. Diagnostics is woefully under-utilized, and we are embarking on a paradigm shift as the US transitions from "chronic sick-care" to "preventive healthcare". More effective precision (or personalized) diagnostics and therapeutics are key to this transition.

Given the growth opportunities in the Dx sector, investor attention has been largely focused on gross margins as a measure of potential profitability understanding that investment in SG&A and R&D are necessary to fuel future growth.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EV/Sales, EBITDA and Revenue CAGR, EBITDA Margins, ROIC, FCF Yield, Debt to EBITDA

Organic growth and consistent margin expansion are the two most important fundamental drivers for sector returns. Accelerating revenue trends have been a key driver of share price performance for the sector. In Dx, gross margin expansion can provide a view on the efficiency of manufacturing and the sustainability of the longer-term revenue model.

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Diagnostics					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
QGEN	Qiagen NV	11.3B	14.73X	9.43%	-2.80%	28.72%	5.36%		13.17%	2.72%
EXAS	Exact Sciences Corp	8.0B	-20.95X		11.91%	-26.39%	-5.60%	(14.471%)	-14.09%	1.45%
QDEL	Quidelortho Corp	6.4B	6.74X	10.36%	-12.78%	21.97%	12.25%	74.96%	-11.73%	87.56%
GH	Guardant Health Inc	4.7B	-9.89X	(11.102%)	26.77%	-123.16%	#VALUE!	(31.7%)	32.33%	-4.38%
NTRA	Natera Inc	4.3B	-7.76X	(30.393%)	21.27%	-56.52%	-10.68%	(63.344%)	-4.96%	4.81%
MRVI	Maravai Lifesciences Holdings Inc	3.6B	5.97X	25.46%	-50.57%	65.04%	11.19%	128.1%	17.76%	13.67%
ABCM	Abcam PLC (ADR)	3.4B	24.57X	19.42%	13.70%	23.00%	#VALUE!	22.19%	118.80%	22.89%
BEAM	Beam Therapeutics Inc	3.1B	-6.08X	4.65%	-21.27%	-577.90%	#VALUE!	(204.298%)	4.73%	148.44%
NEO	NeoGenomics, Inc.	1.5B	-27.11X	(82.552%)	6.80%	-24.38%	#VALUE!	(3.35%)	3.21%	-4.54%
TWST	Twist Bioscience Corp	1.5B	-4.56X	(23.378%)	30.27%	-99.24%	-14.09%	(82.643%)	-9.36%	36.84%
MYGN	Myriad Genetics, Inc.	1.4B	-73.04X	133.13%	8.30%	-13.17%	#VALUE!	0.16%	-488.24%	-2.10%
ADPT	Adaptive Biotechnologies Corp	1.2B	-4.27X	(22.049%)	17.75%	-94.98%	#VALUE!	(38.217%)	-12.44%	-2.55%
RDNT	Radnet Inc	1.2B	10.15X	8.64%	4.54%	2.86%	#VALUE!	3.15%	-50.00%	1.32%
CDNA	CareDx Inc	0.7B	-24.95X	719.01%	8.42%	-5.73%	#VALUE!	11.94%	1900.00%	-6.09%
CSTL	Castle Biosciences Inc	0.6B	-5.85X	(34.533%)	23.04%	-58.19%	-7.13%	(70.161%)	-8.65%	16.31%
NVTA	Invitae Corp	0.6B	-4.03X	(22.172%)	0.35%	-123.36%	#VALUE!	(22.229%)	-20.59%	-19.91%
MXCT	MaxCyte Inc	0.6B	-12.81X	(22.34%)	27.44%	-42.41%	#VALUE!	(16.274%)	-7.27%	5.48%
SRDX	SurModics, Inc.	0.5B	-24.38X	(51.894%)	12.22%	-21.73%	#VALUE!	(13.347%)	-19.61%	0.20%
QTRX	Quanterix Corp	0.5B	-1.79X	(16.175%)	4.00%	-137.37%	#VALUE!	(150.423%)	6.35%	-18.63%
OSUR	OraSure Technologies, Inc.	0.4B	16.85X	1.71%	-34.77%	0.75%	#VALUE!	(9.093%)	1242.86%	9.62%

Management Commentary

Exact Sciences (EXAS) on Cologuard 45…. "And longer term, I said before, longer term, this is over half of our revenue. And that's important because that's a recurring source of revenue. We know where these patients are. We can easily reengage them. It's also a much higher margin source of revenue. So it's a win-win for patients and for us. Cologuard 45, last year, the target had been $40 million of revenue. We exceeded that. This year, we put out a target of $100 million. Things are off to a good start there. So I feel good about both those targets. Longer term, again, that 45 population, 45 to 49 is 19 million people, 19 million people who are essentially all unscreened. They're all typically busy with work in their lives and don't have time to take off 2 days to go in for a colonoscopy. So we're seeing very, very strong early uptake in that younger age group. The fact that the uptick there is nicely surpassing the pace of uptick we saw that when we first launched Cologuard in the 15 over age group. So we're excited about that one. And then electronic ordering, huge driver, again, this helps us broadly across all avenues of the business. Over the past 2 years, we went from 30% of orders of electronic to then 40 and now and recently hit 50. So that's a huge driver. Again, that connection is important because when you connect electronically with the physician, you make it easier for them to order. The alternative is a fax. And it's in a fax -- who wants to do that this day and age. So if you can press a button and click an order, right? And send the order in that way, the doctors order far more test. So that's a big driver. It's also really important for the future. As Matt and the rest of the team launched new pipeline products. The world that launch that into is a world full of electronic ordering."

OptionsHawk Executive Summary & Focus Stocks

This group was hit hard in 2022 with most stocks down 40% or more as a long-duration group lacking profitability. **Qiagen (QGEN)** is the largest name, and the healthiest, as it continues to post beat and raise quarters yet trades < 15X EBITDA and still see it as a potential M&A target after prior attempts, size March $55 calls in open interest. Of the smaller names, **Exact Sciences (EXAS)** is still a name I believe in despite a lack of profitability currently with a massive opportunity for Cologuard and showing signs of better operating leverage. **Abcam (ABCM)** looks interesting as a name driving strong double-digit EBITDA/Revenue growth with rising estimates. ABCM margins are improving as it ends an investment phase for the company. The rest of the small names do not look very healthy on financials but **Quanterix (QTRX)** has seen options activity and insider buying pointing to a move higher.

<u>Services – Managed Care</u>

Components: UNH, CVS, ELV, CI, HUM, CNC, MOH, TDOC, ALHC, AMWL, BHG, SHCR

International & Private Peers

Intro

For the first time in years, it appears that plans have slowed a previously aggressive pace of geographic expansion and pricing broadly does not appear to be overly competitive from the public carriers. In general CNC appears to be pricing the most aggressively, followed by ELV/CI being more balanced and MOH/OSCR appearing to price most conservatively. Rising interest rates, inflation, and a supportive policy backdrop are tailwinds for this group. Utilization is the swing factor with data points suggesting it continues to lag and this should translate to lower MLR and earnings upside. A brutal flu season has weighed on MCOs recently but does little to change the fundamental long-term growth.

Industry Backdrop & Investment Considerations

The Managed Care industry is valued at $1.2 trillion and a group of just a handful of companies with expectations for 10-13% annual EPS growth. The top line growth is seen at 6-9% driven by enrollment growth and net premium yields. Competitive advantages vary between products, but scale is a common denominator. Companies with large membership bases can generate lower overhead costs per member by leveraging technology investments and care management platforms. Meanwhile, given that much of the future membership growth is coming from government businesses where pricing is dictated to the MCOs, medical management capabilities increasingly are a differentiator. In addition, companies have diversified away from commercial, into faster growing government and ancillary programs (only ANTM gets more than 1/3 of its earnings from employer sponsored coverage). The main difference between MCOs and most other insurance lines is that health insurance tends to be a short-tail insurance product so companies make money on the underwriting and a modest amount on interest income (as compared to life insurance where underwriting margins are thin and most of the profit comes from investment returns over a long period of time).

While the shift to value-based care has been an emerging theme for many years, there has been an acceleration in the adoption of risk-based payment models in healthcare. Albeit still early, global capitation has shown evidence of success through lower MLRs, lower hospitalizations, and higher quality scores. Only 3% of US insured lives are in capitated risk arrangements, and even in Medicare Advantage (~$350bn of medical spend with meaningful potential for VBC), less than one-third of lives are capitated. In this report, we size the revenue/earnings potential of moving MA lives to global cap and look at primary care clinic economics. The TAM is significant, with UNH having an $6.7-11.9bn EBITDA opportunity and HUM $4.1-7.2bn if their MA lives are capitated through owned provider assets. While in the much earlier stages, CVS also has significant profit potential from its PCP-focused strategy ($3.0-$5.3bn), with its planned rollout of 250-350 clinics having potential to capture 21-36% of this TAM.

Indicators, Metrics & Stock Selection Framework

P/E, EPS Growth, ROIC, EBITDA Margins, Debt to EBITDA

The most common metric used to value managed care sector is the P/E multiple. Historically, the group has traded between 12-18x with an average of 15.8x.

Valuation & Comps

P/E to Forward EPS CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Managed Care					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
UNH	UnitedHealth Group Inc	510.0B	16.72X	11.73%	10.02%	9.62%	#VALUE!	13.69%	2.18%	1.48%
CVS	CVS Health Corp	133.0B	8.25X	0.22%	3.45%	5.22%	#VALUE!	6.87%	4.23%	2.17%
ELV	Elevance Health Inc	124.0B	13.18X	9.76%	5.11%	6.29%	#VALUE!	10.45%	2.08%	2.19%
CI	Cigna Corp	101.0B	10.95X	9.8%	5.18%	5.50%	#VALUE!	7.93%	2.96%	0.89%
HUM	Humana Inc	66.2B	12.95X	10.4%	9.27%	5.68%	#VALUE!	11.34%	3.84%	0.50%
CNC	Centene Corp	47.1B	9.25X	11.16%	-0.06%	1.38%	#VALUE!	9.46%	6.02%	5.32%
MOH	Molina Healthcare, Inc.	20.4B	9.39X	14.51%	4.37%	4.62%	#VALUE!	175.25%	4.09%	6.55%
TDOC	Teladoc Health Inc	4.6B	21.54X	20.39%	13.48%	-11.73%	1.87%	(2.599%)	3824.36%	-7.31%
ALHC	Alignment Healthcare Inc	2.3B	-60.69X		21.49%	-9.27%	#VALUE!	941.73%	-10.44%	5.57%
AMWL	American Well Corp	0.9B	-1.84X	(36.232%)	15.44%	-102.77%	#VALUE!	(45.485%)	13.19%	-1.60%
SHCR	Sharecare Inc	0.7B	30.10X	34.79%	16.60%	-22.23%	#VALUE!	(35.087%)	266.67%	-7.60%
BHG	Bright Health Group Inc	0.5B	-0.32X		-54.48%	-15.48%	#VALUE!	(306.596%)	28.31%	-3.28%

Management Commentary

CIGNA (CI) Analyst Day on the Evernorth business and biosimilars… "Now Evernorth's opportunities for growth are compelling. And in fact, our balling proposition is resonating with buyers. Already today, 2/3 of the Fortune 50 entrust their health with Evernorth. Seven of the top 8 health companies work with us, and

Evernorth has a relationship with the top 10 health plans. Now today, Evernorth's total addressable market for health plans is massive. It's over $900 billion. And Evernorth today provides services to approximately 60% of all of the health plans in the U.S., but only are capturing about 9% of the addressable market. So that leaves us with a lot of headroom to meaningfully deepen those relationships to grow within our existing customers. We also have the opportunity to cultivate new relationships, leveraging our insights and being in a position to connect our solutions and capabilities in a way that meets our health plan clients' needs. Specialty pharmacy generally is about a $315 billion market across both the pharmacy and the medical benefit, and we expect that to grow in the mid- to high single digits over the next several years. That growth will be fueled by new drug launches, particularly in inflammatory conditions, oncology, rare conditions as well as gene and cell therapies. And those figures include the impact of biosimilars, which will decrease specialty spend overall and represent savings for our clients and patients, while helping fuel growth for Evernorth. The pharmacy build portion of the specialty drug market is about $190 billion. We expect that to grow to about $260 billion by 2026. Accredo has an approximate 25% share of that market and generates more than 35% of Evernorth's total revenue. But because of our unique strengths and our capabilities, we expect that we will grow faster than the overall market. Over the next 3 years, we expect that nearly 30% of the top 25 specialty products will face competition from generics or biosimilars. This includes Humira. Humira is a drug which treats a range of different inflammatory conditions, such as rheumatoid arthritis and Crohn's disease. Over the past decade, it's been one of the top-selling drugs in the world. And starting in '23, we'll finally face competition from biosimilars. More generally, we expect biosimilar usage to begin to accelerate in '23, with more significant uptake in '24 and beyond. Today, approximately 7% of our total specialty spend faces competition from a generic or biosimilar. By 2026, we expect this ratio to exceed 25%. That translates to a $100 billion market opportunity. And of that $100 billion, we impact about $30 billion of that spend, and we expect to be able to drive savings off of that base."

Humana (HUM) on the five parts of its investment thesis…. "First is the strong industry fundamentals that exist in the Medicare Advantage space. Second is our competitive positioning within the industry and the differentiated capabilities that enable our leading platform complemented by the investments we've made in 2023, which will position us to grow at or above industry growth rates. Third is our value-based health services delivery ecosystem in primary care and home health, which will drive sustained EPS growth well beyond 2025. Fourth is the integration of our individual health services businesses in the local markets, which will create further value for our shareholders and for our customers. And fifth is our discipline in and focus on productivity and capital returns, which will drive further operating leverage. Medicare Advantage with its strong demographic growth and superior value proposition has only gotten started. Currently, there are 64.3 million Medicare-eligible individuals in the United States. Thanks to strong demographic growth, this addressable market will continue to grow, and by 2030, 1 in 5 U.S. residents will reach retirement age. Home health is our second growth platform in value-based care delivery, which we have significantly scaled when we bought the remaining 60% interest of Kindred at Home and have recently rebranded to CenterWell Home Health. This transaction anchors our presence as a market leader within the large, growing and highly fragmented home health industry. Home Care is currently a $120 billion market in the U.S. Like primary care, we have access to diverse profit pools in this market, including payer-agnostic revenue."

OptionsHawk Executive Summary & Focus Stocks

This industry has consolidated in recent years and one of the small caps in this grouping has healthy financials. **Molina (MOH)** with a $20B market cap is the smallest of the large caps and if there is another deal, it is a candidate, cheap at 9.4X EBITDA while having solid growth and rising estimates. **United Health (UNH)** trades at a bit of a premium but continues to be the best-in-class name with the strongest growth and margins while making key moves into the value-based care theme. **Humana (HUM)** is the other preferred name in this group trading 13X while having a strong growth profiles and above-average margins.

<u>Services – Specialty Care</u>

Components: FMS, ACHC, AGL, SGFY, DVA, OSH, ONEM, PRVA, LFST, AMEH, CANO, USPH, EWCZ, CLOV, JYNT

International & Private Peers

Intro

The largest plays are the Dialysis companies, DVA & FMS. Chiropractic and Physical Therapy outpatient clinics are covered by JYNT & USPH. Oak Street (OSH) operates a network of primary care centers for Medicare-eligible patients. Acadia (ACHC) is a leading provider of Behavioral Healthcare service facilities while LifeStance (LFST) operates as an outpatient mental health platform. Agilon (AGL) offers healthcare services for seniors through PCPs. Cano Health (CANO) operates health care centers and pharmacies. OptionCare (OPCH) is a leading provider of home and alternate site infusion services. EWCZ is a recent IPO offering out-of-home waxing services. The group also includes some of the emerging digital players in the Healthcare Services space. Apollo (AMEH) operates an integrated healthcare delivery platform that enables providers to successfully participate in value-based care. One Medical (ONEM) is looking to modernize healthcare via a primary care platform utilizing digital health. We have seen both SGFY and ONEM acquired in this group in 2022.

Psychiatric care is a high ROI business with a solid supply/demand imbalance and good volume growth. COVID seems to have been a net beneficiary for this business as many people are suffering from pandemic-related stresses, and the stigma around getting care continues to decline. Dialysis is a stable, recurring business with good ROI. Although dialysis volumes per patient have been stable during the pandemic because ESRD (end-stage renal disease) patients need treatment 3-4x a week in place of a transplant to remain healthy, the real headwind from COVID has been the higher mortality rate associated with the dialysis patient population. Meanwhile, dialysis is potentially facing a more difficult commercial contracting environment after the Supreme Court allowed a self insured plan to cut dialysis providers entirely out of network.

The market AGL competes in can be described as the physician enablement industry, and the companies are seeking to address large cost and quality challenges in the US healthcare system with primary care physicians (PCPs) at the center of that solution. There are increasing tailwinds in the large growing market where AGL competes including (1) primary care business model challenges that are encouraging doctors to engage with VBC platforms like AGL, (2) an aging demographic, (3) growing embrace of VBC contracts at the payor level, and (4) increasing support from CMS via programs like ACO Reach. The combined tailwinds of CMS programs, healthcare cost and delivery challenges, managed care companies increasingly engaging in value based care contracts, and micro challenges facing PCPs in existing fee-for-service (FFS) business models are driving rapid growth in the industry

Industry Backdrop & Investment Considerations

The CMS estimates a total US addressable market for provider services at $838B for 2021. The increase in value-based payments is spurring a shift to outpatient care from inpatient care to reduce cost of care and improve patient experiences.

These businesses are being driven by many of the same Healthcare of the future factors with an ageing global population, rising life expectance, more chronic diseases, and cost pressures to the healthcare system. Many of these are looking to scale nationally and are currently focused on small sub-sets of the much larger opportunity of moving to value-based care.

Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, Revenue Growth, EBITDA Margins

Management Commentary

Acadia Health (ACHC) on its businesses….. "And in-patient acute is still a very important part of our business, were $2.6 billion in revenue and half of our revenue is in-patient related. And obviously, these are folks that are deemed dangerous to themselves or others. And we see a lot of continued opportunity in that business. I mean, right now, it's 50% of our revenue, 51 facilities that we have. We can continue to grow through de novos, JVs. We're always looking for opportunities there. I think the second segment of our four that I will -- that I'd highlight is our specialty business, which is folks that would have a disorder, whether that's an eating disorder or other substance use disorder as well. And that is right now 22% of our business. We have 37 different facilities across the U.S. and we do a really good job just with a strong marketing team and that is a different type of patient that is voluntarily coming to one of our facilities to get treatment, all in-patient. And then on the out-patient side, our third line of business is our CTC business, our comprehensive treatment centers, which is right now about 18% of our business which is -- we're helping people that have opioid use disorder across the country. We're in 37 different states. And then finally, our residential treatment facilities, which is really serving adolescents and children that -- in a non-hospital setting, but a residential type facility that there's opportunity to help them with various psychiatric disorders as well. So those are the four."

OptionsHawk Executive Summary & Focus Stocks

We have seen M&A active in this group with deals for ONEM and SGFY. I see challenges persisting for the dialysis names (FMS, DVA) and despite cheap valuations expect numbers to come lower. **Acadia (ACHC)** is the real standout here with high margins and growth as psychiatric services are in strong demand. **Privia (PRVA)** is another favored small cap with strong growth and nearing profitability though shares sold off hard in 2H22 but its platform to transition provider groups to value-based care has a lor of potential and estimates have risen sharply this year. **Apollo (AMEH)** looks cheap at 11.5X for a name beating and raising with its strong operating model across all part so the healthcare value chain. **European Wax (EWCZ)** would look attractive with high margins and growth but the major concern is the balance sheet with it carrying a ton of debt and already trading at a premium valuation.

Services – Hospitals

Resources: American Hospital Association

Components: HCA, UHS, EHC, THC, SEM, SGRY, MD, PIII, EHAB, CYH

International & Private Peers

Intro

The set up for 2023 appears strong, with a fully year benefit of improving trends after a highly disrupted 1H, better pricing starting to flow through and exchange subsidy extension providing a lift to hospitals. 2023 should be better with: 1) Pricing (commercial and Medicare) improving with more upside in 2024, 2) The Inflation Reduction Act (IRA) supporting coverage. 3) Continued labor normalization. Hospitals actually grew

EBITDA during the Great Recession. During periods of rising interest rates, highly levered names are often penalized.

Ambulatory surgery centers (ASCs) continue to be one of the largest beneficiaries of the volume shift to the lower cost, outpatient settings. CMS and other payors alike should continue to finalize strong rates updates for the subsector.

Industry Backdrop & Investment Considerations

Volume for US hospitals continues to recover, albeit slowly, while higher-end patient care has been less impacted than lower-end care, dampening the financial impact.

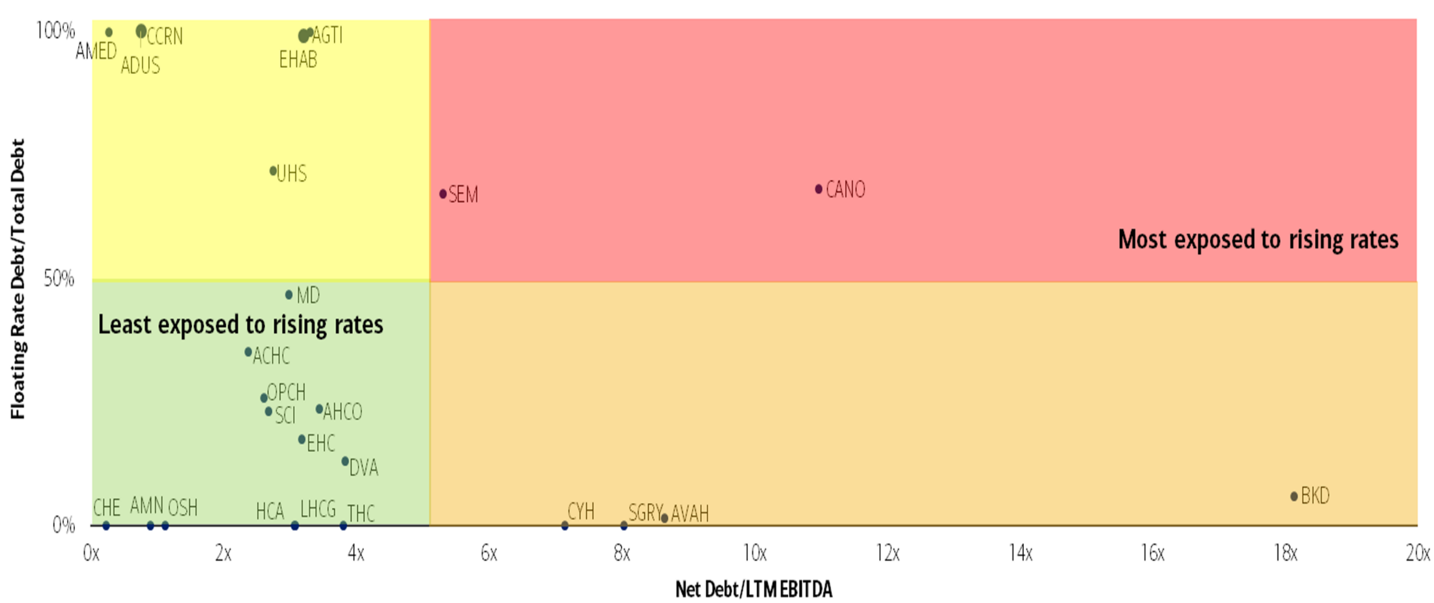
Admissions, average lengths of stay and reimbursement amounts continue to be negatively affected by third-party payer pre-admission authorization requirements, utilization review and pressure to maximize outpatient and alternative health care delivery services for less acutely ill patients. Increased competition, admission constraints and third-party payer pressures are expected to continue. Labor is usually the largest cost for health care providers, ranging from ~12% of revenue for home infusion companies to ~70% of revenue for physician services companies.

Key themes the next few years include the continued recovery of volumes with patient backlog, supportive pricing from a healthy economy, and moves to higher margin/growth services. A key risk is the potential lowering of Medicare eligibility to age 60 from 65 which would be a pricing headwind with the lower than commercial rates. The group also faces an unwind of the higher margin acuity mix that drove pricing well above long-term trends.

Indicators, Metrics & Stock Selection Framework

US public hospitals can generally be categorized as value stocks, with MSD sales and EBITDA growth profiles and M-HSD EV/EBITDA valuation. Hospital companies have a lot of industry-specific metrics like Admissions, Average Length of Stay, and Occupancy Rates. Revenue Per Adjusted Admission (RPAA) is another metrics and over the last four years has grown in the 1-4% range. Traditional metrics are also used such as EV/EBITDA, P/E, EBITDA Margins, FCF Yield and Revenue Growth.

Net debt/LTM EBITDA vs % of debt that is floating rate (swap adjusted)



Management Commentary

HCA Health (HCA) on labor markets, and demand trends…. "Secondarily, we see it, for us, the labor market improving sequentially, just like we thought we would. We know we had labor pressures earlier in the year. Our contract labor was down almost 20% sequentially from Q3 to Q2. Our recruitment is up. Our turnover is down. And so I think our initiatives and our team's focus around the labor environment, we're starting to see signs of that. We're clearly not out of the woods yet, but we continue to see some sequential improvement in the labor environment. So that's a very positive trend for us as well. Well, first, one level, we have this belief that it's going to continue to be a growing demand for health care services in our market. We've been in our markets for a long time. If you look 10, 20 years of historical kind of trends, there's this growing demand for health care. So that's some of our macro beliefs and we're beginning to see that, I mean. It doesn't always return at a straight line pace, if you will. But we have this belief that there's reasonable demand in our markets, and we're well positioned to capture it. I think on our third quarter call, we talked about that, that we could see 1% to 2% inpatient demand going forward right now. And we see outpatient demand probably growing a little bit faster than that, perhaps in the mid-single digits."

OptionsHawk Executive Summary & Focus Stocks

HCA Health (HCA) is the clear leader and best-in-class name with a strong 7.25% FCF yield though modest growth seen the next two years. HCA has leading margins and at 9X EBITDA fits into the value buy category. **Encompass (EHC),** a small cap, screens most favorable into 2023 after spinning out EHAB. **Surgery Partners (SGRY)** is a healthy looking small cap and one that could be a nice acquisition target for private equity.

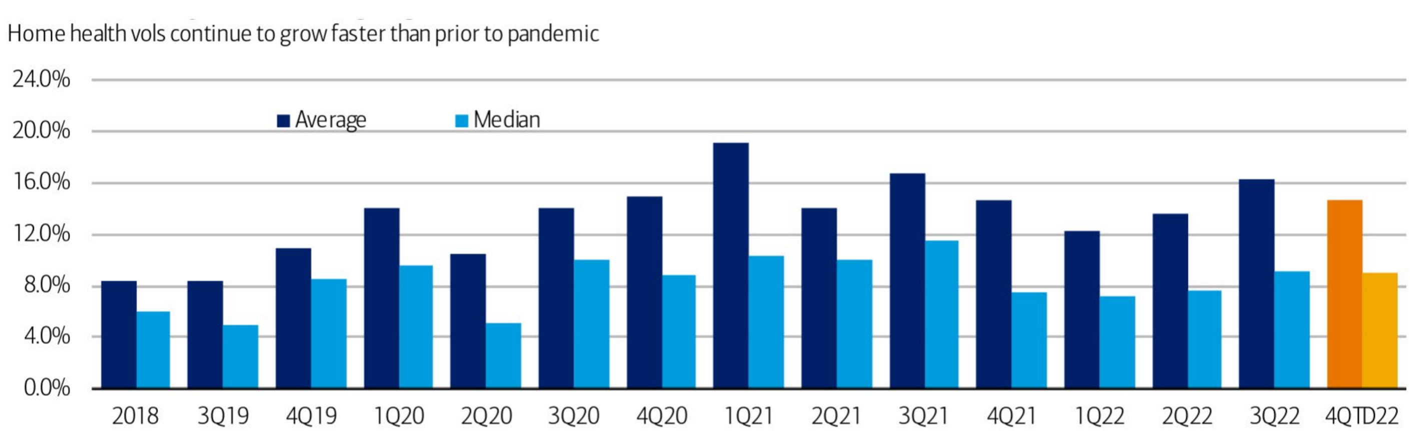
Services – Home Health Care

Components: CHE, OPCH, LHCG, ENSG, AMED, ADUS, INNV, PNTG, AVAH

International & Private Peers

Intro

The Home Health group like many others in this sector is looking at the labor market as a key headwind. Overall, the HC labor market has been improving but very slowly – home health is the most exposed. Home health volumes in October decelerated slightly from September while hospice vols accelerated significantly M/M. Agencies expect wage growth of +7.3% y/y in 2022 (+5% median), with the wage growth expected to decelerate to +6.2% next year. Meanwhile, total labor costs (including contract labor) are expected to increase +8.7% y/y in 2022, and decelerate to +6.9% y/y in 2023, still well above the +2-3% increases observed prior to 2020.



Industry Backdrop & Investment Considerations

Healthcare spending currently represents 18% of U.S. GDP and population above 65 projected to nearly double by 2050. Approximately 70% of Americans who reach age 65 require some form of long-term care for an average of 3 years.

The U.S. long term care market size was valued at USD $445B in 2019 and is expected to register a CAGR of 6.8% the next five years. Demand for long term care (LTC) has increased owing to the recognition of unmet needs of the elderly, which are not fulfilled by hospital settings. According to estimates of the U.S. Department of Health and Human Services (HHS), around 69% of the U.S. population will require long term care services in their lives for an average of about three years, thus impelling the demand for long term care services in the region. The Nursing Facility industry is estimated at $130B in 2020.

The US home healthcare market is projected to grow about 7% annually from $103B in 2018 to $173B by 2026 — outpacing growth in all other care types, including hospital care (+5.3% annually) and physician services (+5.6% annually). The home care market is currently estimates at $115B broken into Home Health at $25B, Hospice at $23B, Home Medical Equipment at $20B, Personal Care at $17B, Home Infusion at $14B, Pediatric Nursing at $10B and Telehealth at $5B. The Home Health industry is positioned to benefit from the aging demographics, rise in chronic conditions, the shift of care towards lower cost settings and increased consumerism (patients prefer to receive care in the home). Margins are generally in the 10-20% range and given the low capital intensity nature of the business, free cash flow conversion is generally strong. With the market still quite fragmented, M&A is likely to be a theme for years to come. Home health is only 1/3 of the cost of a stay at a skilled nursing facility (SNF), while hospice can reduce Medicare spending by 20-30% when used in the last year of life. Meanwhile, the use of personal care reduces the likelihood of nursing home placement by 46%, thus reducing spending. Tele-health cost is a fraction of an emergency department visit and only 40% of the cost of an urgent care or primary care visit. Meanwhile, HME allows patients to treat their conditions in the comfort of their home on an everyday or extended basis, helping to shorten hospital stays or avoid SNF stays. Just as important, seniors prefer to age in place as opposed to institutional settings creating aligned incentives to shift care.

Driven by strong secular shifts (aging demographics/shift in care to lower cost settings/patient preference), the traditional home care industries are growing at mid to high single digits. Personal care and hospice grow 7-8%, followed by home health and home infusion at +6%. Within home medical equipment (HME), sleep apnea (+8%) outpaces other categories (respiratory +6%, wound therapy +5%). Pediatric private duty nursing is growing the slowest (+4%) given its target patient base being children and young adults. Meanwhile, tele-health is growing the fastest at 20-30%.

Aging demographics, a shift of care into lower cost settings, and consumerism drive strong demand for home care services. The expectation is for long term organic growth in the mid to high single digits with personal care demand growing double digits. Companies see several ways to outpace the market growth: better quality outcomes drive more referrals and better pricing in the future; market density, scale allows better wages and benefits which helps recruiting/retention and thus volumes.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, EBITDA CAGR, ROIC

There is a strong correlation between organic growth and valuation. EBITDA multiples are generally used versus organic revenue growth rates for comparisons. EBITDA margins are the preferred profitability measure.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Home Healthcare					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
CHE	Chemed Corporation	7.6B	17.14X	8.74%	3.60%	15.36%	#VALUE!	37.78%	1.97%	-2.35%
OPCH	Option Care Health Inc	5.6B	18.85X	(4.321%)	8.79%	5.95%	4.32%	6.72%	-12.71%	5.13%
ENSG	Ensign Group Inc	5.2B	12.92X	9.02%	11.38%	10.38%	#VALUE!	24.25%	1.84%	2.10%
LHCG	LHC Group Inc	5.1B	25.12X	7.82%	5.35%	9.08%	#VALUE!	10.32%	-24.49%	-7.10%
AMED	Amedisys Inc	2.8B	12.74X	3.86%	6.19%	9.55%	5.88%	17.24%	-9.01%	-5.43%
ADUS	Addus Homecare Corporat	1.7B	17.72X	7.61%	7.70%	9.26%	#VALUE!	9.76%	-5.77%	-1.14%
INNV	InnovAge Holding Corp	1.0B	-52.22X		5.43%	-9.70%	-5.53%	(2.904%)	-444.83%	-1.87%
PNTG	Pennant Group Inc	0.3B	11.36X	10.63%	7.06%	5.77%	#VALUE!	10.73%	-10.94%	1.49%
AVAH	Aveanna Healthcare Holdi	0.2B	11.57X	10.59%	3.78%	1.87%	#VALUE!	4.36%	-95.19%	-6.22%

Management Commentary

Chemed (CHE) on Labor/ADC…. "With that being said, the -- we made some commentary inside of our third quarter results and the Q&A of seeing some encouraging signs on week-over-week sequential ADC growth that we haven't seen since the start of the pandemic. And so that's really encouraging not only because it is consistent with what we're talking about of building clinical capacity. The business is there. We're going to continue to bring on more patients, and the days of care contribution from those patients, we would expect and anticipate continuing to expand. And a different way to answer the question on something we've been consistent with over the last 2.5 years is when the pandemic started, if you think about all the patients we had on service at that time as 1 cohort, cohort A, all those patients and their disease ran through the same trajectory it was almost un-impended by the pandemic, right? We were able to be out with them. We were able to care for them. But the new patients that we brought on from that point forward were accessing the hospice benefit later in their disease trajectory. And so that weighting of cohort A and cohort B had an impact to cause downward pressure on census like it has for the entire industry. That took about 6 to 9 months from when the pandemic started because of the dynamics of that for everyone to begin to see it. Now when we're on the tail end of it, where you would expect that, call it, that 6-month lag, which hopefully we're now at the end of having transpired, where we're all getting back to business in terms of being able to service the communities in which we operate and grow census on a sequential basis. In other words, people are going back to the doctors, going back to the hospitals, getting terminal diagnoses, but we're limited in service. Certainly on the hospital, you see that last quarter, our hospital admissions were down 23%. That's because we didn't have the staff to do it. So we've already completed the cycle where the normal referral industry for the hospice has returned to what we would expect that to be, something that would be very good for us."

Addus (ADUS) on hiring and margins…. "Overall, we feel the trend in both hiring and turnover is moving in a positive direction in all segments of our business, which should help us serve more consumers and patients. During our third quarter, the funding we received from the American Rescue Plan Act, or ARPA, has allowed us to begin to increase caregiver wages, pay sign-on and retention bonuses or provide onetime bonuses to current caregivers depending on the state program. This has been helpful with our recruitment efforts over the past quarter and should help our hiring and retention efforts as we have a significant portion of these dollars still to be utilized. As for Illinois, our largest state of operations on July 1, minimum wage increased by approximately $0.40 per hour for our Chicago area personal care workforce. This negatively impacted our gross margin in the state during the third quarter. However, we will receive a $0.70 per hour statewide rate increase effective January 1st, 2023. Once we receive the statewide rate increase, we will likewise adjust wages for our remaining Illinois employees, which we believe will help with caregiver recruitment while positively impacting our gross margin profile in Illinois."

Ensign (ENSG) on occupancy, labor markets and funding…."Additionally, we saw continued improvement in occupancy, with same-store and transitioning operations increasing by 2.4% and 5.3%, respectively, over the prior year quarter. Recently, the federal government extended the state of emergency to January 2023, which keeps in place many of the regulatory and other forms of assistance helpful to patient care. I feel like CMS has been really thoughtful about the changes they've made within the comp lines that they operate. And so we have a good outlook there. On the state side, obviously, the overhang there would be on the FMAP funding and whether or not the state of emergency continues. With that all said, we have really good visibility into our state-by-state funding for the most part. Whether the state of emergency sticks with us or not, we have, in our larger states like Arizona and California and some of our other states, we've got good long-term visibility into our rates for 2023 that will be stable regardless of the state of emergency and FMAP funding. We also have a pretty clear indication that in Texas, one of our bigger states, that a rate increase is on the horizon, a really healthy increase that's much needed. The only piece that's uncertain there is on the time frame between when the potential FMAP funding might go away and when the rate increase would happen towards the latter half of the year. On the other front, I would just tell you the fundamentals behind our revenue, which is obviously occupancy, we feel really strongly about our continued progress that we've had through this last quarter, but also, more importantly, the 6 preceding quarters where we've had very stable, steady growth regardless of whatever COVID challenges we faced. And that's been very encouraging, to see that trend continue in spite of what is typically somewhat of an up-and-down road as we experience seasonality. And so we feel real confident about that. As far as the labor environment goes, it's -- we were seeing some really good indicators from -- going from first to second quarter, where we saw our agency utilization drop. When we entered into the third quarter, as you know, we experienced quite a large step-up in COVID cases that affected both our patient population as well as our employees. We also see indicators that our wage growth is stabilizing. It's the lowest it's been since last year in terms of quarter-over-quarter wage growth. It's not that we expect that the labor situation will moderate in the near term. It will probably take several quarters for us to get to more of a stable, steady state."

OptionsHawk Executive Summary & Focus Stocks

In this group **Ensign (ENSG)** screens attractive at 12.9X EBITDA with double-digit growth and industry-leading margins while occupancy trends continue to improve. **Addus (ADUS)** screens best in elderly care and could be the next M&A target following recent deals in the space.

Medical Devices

The big three important factors for these names are product pipeline, operating leverage, and execution. Revenue growth is generally driven by product introductions and hospital patient enrollments. The aging population and growth of the over-65 age group will create more opportunities for companies selling medical products and devices. Other drivers of the medical device industry include better penetration in emerging markets due to improved infrastructure, new innovative treatments, increased affordability due to rising per-capita GDP, and a growing prevalence of "lifestyle diseases" like obesity due to urbanization. A few key growth drivers across the device markets include Diabetes Care, Robotic Surgery, and Structural Heart – TAVR.

Devices/Equipment – Orthopedic

Components: SYK, ZBH, SNN, GMED, NUVA, IART, ENOV, CNMD, NUA, TMCI, ATEC, KIDS, SIBN, OFIX

International & Private Peers

Intro

While sector fundamentals remain stable with September commentary supportive of an acceleration in procedures out of the summer, headwinds - including staffing - are increasingly looking more structural vs. transitory. Margins remain in focus, acting as the greatest source of risk to bottom-line performance given intensifying FX headwinds and ongoing inflationary pressures. Rising interest rates present an additional obstacle to companies with higher levels of floating rate debt. Early next year when companies give guidance it will likely be conservative given the 2022 surprises, but investors will likely be anticipating upside to margins and EPS in the 2H of 2023 as this year's inflationary costs roll off mid-2023.

MDT recently delivered a weak report, but Spine was a notable bright-spot with mid-teens growth and saw similar strength from NUVA and GMED. Treace's (TMCI) Lapiplasty procedure is well positioned to replace traditional surgical techniques and gain further surgeon penetration and market share.

Industry Backdrop & Investment Considerations

The global orthopedic devices market is expected to grow at a 5% CAGR through 2027 to a value of $81B. According to World Health Organization (WHO), the geriatric population is expected to reach 2 billion by 2050. The rising population base is likely to generate substantial demands for different implants and devices for orthopedic use. Increased diabetes and obesity rates, a lack of physical exercise, poor diet and rising smoking and alcohol intake will boost consumer demand during forecast period. The production of cost-effective devices will be supported by recent developments in osteology. 3D printing, robot-assisted operations and smart devices would have greatly affected the driving forces behind worldwide market revenues in technical advancements. Spine, knees, hips, and trauma products make up more than 65% of the total orthopedic products market.

There is a shift in large joint procedures to outpatient from impatient which could be a catalyst for lower pricing in the future.

The US Installed base of robots ending 2019 at nearly 1,000 could increase to over 3,500 by 2025, a more than 20% CAGR. Stryker has previously noted that it believes that in the US, there are around 2,000 hospitals that are eligible for at least one robot.

Indicators, Metrics & Stock Selection Framework

Medical devices are valued on P/E, EV/EBITDA and EV/Sales with EBITDA Margins and Revenue Growth playing a key role in the multiple.

On 2023 P/E, Medtech is trading at premium to Hospitals, MCO's, Pharma Supply Chain, CRO's and Biopharma

	EV/ Sales			Revenue Growth		P/E			EPS Growth		EV/ EBITDA		Net Debt/ EBITDA		FCF Yield	
Company	**CY22E**	**CY23E**	**CY24E**	**CY23E**	**CY24E**	**CY22E**	**CY23E**	**CY24E**	**CY23E**	**CY24E**	**CY22E**	**CY23E**	**CY22E**	**CY23E**	**TTM**	**CY22**
Medtech Average	4.2x	4.1x	3.9x	3%	6%	18.2x	17.2x	15.6x	6%	10%	14.7x	14.1x	2.3x	2.2x	5%	4%
Tools Average	5.3x	5.1x	4.8x	4%	7%	27.8x	24.3x	21.0x	9%	14%	19.9x	18.8x	1.8x	1.8x	4%	3%
CRO's Average	2.8x	2.7x	2.7x	2%	1%	19.1x	17.5x	16.0x	6%	8%	13.3x	12.5x	2.4x	2.3x	8%	5%
Hospitals Average	1.2x	1.2x	1.1x	5%	5%	9.5x	8.4x	7.4x	13%	14%	7.2x	6.9x	3.4x	3.2x	8%	3%
Managed Care (MCO's)	0.8x	0.8x	0.7x	5%	6%	17.3x	15.5x	13.5x	12%	14%	12.1x	11.1x	0.9x	0.9x	5%	6%
Pharma Supply Chain	0.3x	0.3x	0.3x	4%	5%	11.9x	10.9x	9.9x	9%	10%	9.5x	9.2x	2.1x	2.1x	12%	8%
Healthcare IT	5.0x	4.2x	3.6x	21%	20%	29.5x	22.7x	4.5x	37%	15%	26.5x	20.5x	1.8x	1.5x	2%	2%
Dental	3.7x	3.5x	3.2x	7%	8%	19.6x	17.3x	15.2x	12%	14%	14.1x	12.8x	1.1x	1.0x	5%	4%
Biopharma	5.2x	5.3x	5.3x	(6%)	(0%)	14.3x	14.8x	15.8x	(6%)	0%	11.1x	11.7x	0.5x	0.4x	9%	8%

Management Commentary

Stryker (SYK) on 2023…. “As we look ahead to 2023, we feel optimistic about growth with high customer demand and exciting new product launches. Though the inflationary pressures and supply chain challenges will continue to impact next year, the strong growth outlook, combined with our pricing and cost actions, will position us well to return to strong earnings growth. Procedural volumes continue to recover throughout the third quarter in most countries, and we are beginning to reach normalized levels across most of our business. While we are seeing volumes recover, hospital staffing pressures have continued to impact the ability to reduce procedural backlog in a meaningful way. These challenges will likely resolve gradually, and we continue to expect this will be a moderate tailwind into next year. Specific to Mako, installations for the quarter were soft as we realized delays stemming from variability in the hospital environment. However, our order book remains strong, and we expect a good fourth quarter for Mako. We will update you on our key Mako metrics in January. We continue to be pleased with our Vocera integration progress and remain excited about the strong growth potential of this platform technology. We saw other inflation across almost all categories, but as I noted, most noticeably in labor, metals, transportation. And then all of that and that sort of variability of supply chain really drove just inefficiencies in our manufacturing process. And so that -- we had lots of stops and starts, which, as you know, just drives up more cost. So I think, if I think about it, what's transient, what's not, I think in Q4, we have good visibility to supply and feel confident enough to raise our sales guidance, which is what we did.”

Zimmer (ZBH) on new product optimism….. “In our Q3, our new product pipeline continue to deliver as well. While it's early, we're definitely excited about the launch of HipInsight. This is the first FDA-cleared mixed-reality navigation system for total hip replacement. HipInsight is the latest addition to our OptiVu portfolio, and it further expands our ZBEdge suite of solutions. Additionally, we announced the FDA clearance of our Identity Shoulder System. This is a technology that has proprietary capability of aligning each surgeon's approach to an individual patient's anatomy. All of this with the goal, first and foremost, of alleviating pain, but also optimizing the range of motion for that patient. And I got to tell you, our existing product portfolio kept up the momentum as well. Demand continues for ROSA, both in knee and hip. Persona Revision traction in the U.S. remained strong, and our limited launch of Persona iQ is driving positive feedback and interest. And we're focused on aggressive data collection so that we can establish clinical use benefits. And we expect to build on this momentum with new product launches in the coming months, including, as we've talked about, our new Persona cementless form factor, additional launches in our S.E.T. category and a hip product launch that we're excited about in early 2023.”

Globus (GMED) on robotic procedures….. “I'm pleased with the growth acceleration delivered by the U.S. team. Enabling Technologies sales were $24 million, up 20% on a constant-currency basis versus prior year, driven by robotic and imaging system sales. We're seeing increased interest and placements both domestically and internationally. This was our highest Q3 since launching Enabling Tech, surpassing last year's Q3 sales that delivered 124% growth post-COVID. Robotic procedures continue to accelerate, growing 48% versus prior year and exceeding approximately 40,000 robotic procedures performed to date. The Excelsius3D imaging system rollout is going well as we continue to penetrate the market and increase orders for future deliveries. Entering Q4, our pipeline is strong for both robots and imaging systems. We are making significant progress developing other components of the ecosystem with plans to enhance our offering over the next several quarters to fulfill our goal of changing the way musculoskeletal surgery is performed.”

OptionsHawk Executive Summary & Focus Stocks

Stryker (SYK) at 22X EBITDA remains steeply overvalued and prefer **Zimmer (ZBH)** with better margins and rising estimates while trading just 13X. **Globus (GMED),** however, remains the best of the bunch on margins, ROIC and growth at 18.65X. **Enovis (ENOV)** is a small cap worth a look as it takes market shares and has an innovative portfolio across Ortho. **Integris (IART)** fits the mold of an M&A target with its high margins and improving procedural volumes. **Alphatec (ATEC)** is another small cap I favor as an M&A target as it becomes a key player in spine and on the path to profitability.

Devices/Equipment – Cardiovascular

Components: MDT, BSX, EW, ABMD, SWAV, PEN, NARI, IRTC, ATRC, SILK, ATRI, LMAT, CSII, ANGO

International & Private Peers: Terumo, W.L. Gore, Getinge

Intro

MDT recently reported weak results on pockets of slower procedure recovery and delayed supply chain resolution. Management echoed macro commentary heard from other large-caps but struck a more bearish tone vs. peers on staffing shortages constraining procedure recovery. ABMD was bought by JNJ in a large $16.6B deal in this group. BSX's 2024 pipeline could be one of the best in core MedTech, with 2024 a potentially accelerating growth year, suggesting that the stock could see relative multiple expansion in 2023. Inari's ClotTriever and FlowTriever devices are uniquely positioned to disrupt the ~$5.8bn TAM given: (1) Efficacy in safely removing venous clot, vs. competitors who have focused on thrombolysis or aspiration in the arterial system; (2) Established reimbursement; and (3) Significant, early commercial traction, with ~600 hospitals using Inari's technology at ~1.5 years into launch

Industry Backdrop & Investment Considerations

The global cardiovascular devices market is expected to reach $60B in 2022 at a 6.9% CAGR and reach $80B by 2028. Cardiovascular diseases are the leading cause of death across the world. The market for these medical devices is fueled by the high prevalence of cardiovascular disease caused by bad lifestyle choices such as smoking, alcohol consumption, and hypertension, as well as a big senior population.

Product type segments include diagnostic and monitoring devices and surgical devices. Products are segmented into coronary heart disease, sudden cardiac arrest, stroke, cerebrovascular heart disease and others.

Indicators, Metrics & Stock Selection Framework

Medical devices are valued on P/E, EV/EBITDA and EV/Sales with EBITDA Margins and Revenue Growth playing a key role in the multiple.

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Cardiovascular					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
MDT	Medtronic PLC	106.6B	13.11X	1.99%	3.03%	26.63%	5.30%	5.6%	-6.89%	-4.89%
BSX	Boston Scientific Corporation	67.5B	20.77X	9.8%	5.96%	25.55%	3.13%	10.5%	-2.15%	-1.16%
EW	Edwards Lifesciences Corp	47.0B	23.63X	12.61%	7.79%	34.68%	2.60%	29.39%	-3.76%	-6.76%
ABMD	ABIOMED Inc	17.1B	55.68X	25.96%	15.68%	21.81%	#VALUE!	16.5%	13.25%	10.68%
PEN	Penumbra Inc	8.2B	221.72X	76.24%	18.81%	3.66%	#VALUE!	3.46%	-85.11%	-3.08%
SWAV	Shockwave Medical Inc	8.1B	54.95X	36.62%	31.08%	27.99%	#VALUE!	(5.053%)	104.83%	16.36%
NARI	Inari Medical Inc	3.8B	-130.33X		20.09%	-10.18%	-0.70%	8.47%	93.75%	5.17%
IRTC	Irhythm Technologies Inc	3.0B	-261.04X		19.97%	-18.07%	#VALUE!	(44.137%)	10.55%	0.35%
SILK	Silk Road Medical Inc	2.1B	-42.10X	(69.71%)	26.60%	-24.69%	#VALUE!	(99.263%)	10.34%	37.17%
ATRI	Atrion Corporation	1.1B			#VALUE!	21.97%	#VALUE!	10.0%	#VALUE!	#VALUE!
LMAT	LeMaitre Vascular Inc	1.0B	25.33X	17.31%	5.94%	15.76%	#VALUE!	8.29%	-31.88%	-1.40%
CSII	Cardiovascular Systems Inc	0.6B	-143.73X		10.37%	-18.27%	#VALUE!	(17.428%)	-29.73%	8.08%
ANGO	AngioDynamics, Inc.	0.5B	21.74X	34.37%	8.34%	-3.28%	#VALUE!	(0.044%)	-200.00%	9.26%

Management Commentary

Penumbra (PEN) at BAML Healthcare Conference discussing penetration levels…. "So from a penetration standpoint, where stroke is at about 25 -- let's use U.S. numbers just to be easier. We're about 25% penetrated. That stalled -- that went down a little at the beginning of the pandemic. It's come back up, but it hasn't grown yet past that. We can talk about why and how to -- we think that will grow in the future. In the other interventional markets, both arterial, DVT and PE, all 3 of them we think we're less, around 10%, maybe a little less than that penetrated. So there's a lot of room to grow that business going forward. And most of that is not mechanical thrombectomy. I mean, there's some, but most of that is traditional means, either tPA, intra -- cathode or tPA or in some cases, around the arterial side, surgery.

Boston Scientific (BSX) on WATCHMAN…. "So year-to-date, our WATCHMAN franchise has grown about 25%. We've pegged the market around 30%. So we feel really good with the trajectory this year. And we've actually stated that we expect that market to keep growing 30% just with penetration into the existing indication through 2024, and that represents about a $2 billion market. Things like our Versa cross connect, which is an easier solution to accessing the left side of the heart in conjunction with our Baylis access system as well as new products like our steerable sheath in 2023 and WATCHMAN FLX PRO in 2023 plus, those will just contribute to that nice a 30% growth rate. We are just still early days in penetration, right? So if you think about the very large market that WATCHMAN can address, we're still maybe high single-digit penetrated. So there's really a lot of opportunity to continue to improve patient awareness and bring more value through these innovative products."

Edwards (EW) on the TAVR opportunity….. "In summary, we anticipate the continuation of staffing shortages and a difficult winter, COVID and flu season. We expect Q4 TAVR sales to be around $850 million and full year 2022 TAVR sales to be at the low end of our previous range of $3.5 billion to $3.7 billion. We remain confident about the long-term potential of TAVR as the rapidly evolving evidence recognized by policymakers around the world supports continued adoption of this therapy for the many patients suffering from aortic stenosis. This broad-based, favorable evidence, combined with the undertreatment rate and growing elderly population supports our expectation that this global TAVR opportunity will reach $10 billion by 2028, which implies a low double-digit compounded annual growth rate."

Shockwave (SWAV) on M5+….. "We had another strong quarter across U.S. coronary, U.S. peripheral and international. The M5+ launch continues to go very well. Physicians appreciate the enhancements that M5+ brings compared to its predecessor and we are seeing strong volume growth in the U.S. and international markets. Our target is to complete the launch in the U.S. this year so that we can enter 2023, focused on driving penetration versus lunching accounts. We are very pleased with the unit growth we are seeing for the M5 product this year."

Inari Medical (NARI) on opportunity ahead….. "So we estimate here in the U.S., incidents alone, 710,000 patients presenting with either iliofemoral DVT or intermediate high-risk PE, and you can see the breakdown at the top there. When you apply our ASPs against those 2 TAMs, we believe a $5.8 billion TAM here in the U.S. alone. And when you look internationally, that number climbed to north of $15 billion. What's striking about both of these markets is how modest existing interventional penetration is in each market, somewhere between 15% and 20%. And even within that segment, lytics today are still the predominant interventional modality. But the vast majority of these patients, 80%, 85% are being treated with conservative medical management, with anti-coagulation alone that does nothing to address the existing clot, simply it tries to prevent a new clot from forming."

OptionsHawk Executive Summary & Focus Stocks

We recently had the large ABMD buyout in this group which leaves three real large caps, **Boston Scientific (BSX)** favored into a strong product cycle while previous favorite **Edwards (EW)** looks likely headed for further multiple compression and falling estimates. **Medtronic (MDT)** at 13X is in the value buy category with a 5% FCF yield though growth remains subdued. **Penumbra (PEN)** and **Shockwave (SWAV)** both at $8M market caps are two high valuation, high growth names with **SWAV** favored for its better operating leverage and could make a nice acquisition target. Of the remaining small cap companies, **Inari (NARI)** is a favorite with strong products set for rapid growth while SILK/IRTC are other strong growth stories but NARI edges them out being closer to profitability and seeing the strongest upward estimate revisions. **Silk Road (SILK)** makes a lot of sense as an acquisition target with low penetration in a key TCAR market.

Devices/Equipment – Neuro & Respiratory

Components: RMD, NVCR, INSP, AXNX, AHCO, LIVN, NVRO, AXGN, INGN, ZYXI, CLPT, LUNG

International & Private Peers: Elekta

Industry Backdrop & Investment Considerations

The global neurology devices market is expected to reach $10.8B by 2022 and $17B by 2026 with a growing need for development of different neurostimulation techniques with efficient and accurate algorithms for treatment of several CNS associated disorders. Rise in incidence of cerebral stroke and other severe disorders such as Alzheimer's disease, epilepsy, and Parkinsonism is expected to fuel demand of neurology devices thereby driving industry growth. The growth of the global neurology devices market is driven by significant rise in geriatric population across the globe, rise in demand for minimally invasive surgeries, and development of advanced neurological devices. Neurostimulation Devices, Interventional Neurology and Cerebrospinal are the three main product categories.

Respiratory Care market is expected to be valued at $30B by 2025 at a 12.5% CAGR. Respiratory care devices are devices which are used for monitoring, treatment, and diagnosis of respiratory diseases such as asthma, pneumonia, tuberculosis and obstructive pulmonary disease (COPD). The use of these devices improves pulmonary function and lung oxygenation. Respiratory care devices include PAP Devices, Ventilators, Nebulizers, Oxygen Concentrators, and Inhalers. The growth of this market is mainly attributed to the high prevalence of respiratory diseases, rising aging population across the globe, high prevalence of smoking, rising urbanization and pollution levels, increasing incidence of preterm births, and lifestyle changes. The COVID-19 outbreak drew a strong focus to respiratory care in 2020. The rapid growth in the global geriatric population, rising incidence of chronic diseases (including COPD and asthma), and the cost advantages of home care devices and services (compared to hospital visits) are the key factors driving the growth of the home healthcare market. The respiratory care devices market is segmented into therapeutic devices, monitoring devices, diagnostic devices, and consumables & accessories. COPD held the largest share of the respiratory care devices market in 2019. This was followed by sleep apnea, asthma, and infectious diseases.

Indicators, Metrics & Stock Selection Framework

Medical devices are valued on P/E, EV/EBITDA and EV/Sales with EBITDA Margins and Revenue Growth playing a key role in the multiple.

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Neuro/Respiratory					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
RMD	Resmed Inc	32.8B	24.82X	12.04%	8.46%	30.60%	#VALUE!	17.04%	5.75%	6.00%
NVCR	Novocure Ltd	8.0B	231.17X		0.26%	-18.79%	#VALUE!	(8.128%)	13.57%	-2.83%
INSP	Inspire Medical Systems Inc	6.8B	-99.12X	(58.102%)	33.38%	-15.75%	#VALUE!	(81.207%)	2.33%	19.59%
AXNX	Axonics Inc	3.2B	-52.67X	(38.375%)	24.71%	-23.27%	-1.38%	(48.694%)	-33.35%	11.93%
LIVN	LivaNova PLC	3.0B	19.07X	12.9%	3.62%	14.49%	#VALUE!	7.63%	-12.09%	-2.69%
AHCO	Adapthealth Corp	2.9B	7.85X	14.79%	9.32%	7.00%	0.82%	6.01%	-25.47%	1.93%
NVRO	Nevro Corp	1.5B	-61.64X		11.39%	81.70%	#VALUE!	(29.003%)	-2.70%	-4.03%
ZYXI	Zynex Inc.	0.5B	17.92X	49.78%	25.28%	15.79%	#VALUE!	41.02%	5.75%	21.10%
INGN	Inogen Inc	0.5B	-36.04X	96.39%	8.82%	-9.77%	#VALUE!	(4.65%)	50.43%	2.24%
AXGN	AxoGen Inc	0.5B	-39.26X		14.44%	-13.14%	#VALUE!	(11.855%)	-10.00%	0.78%
LUNG	Pulmonx Corp	0.3B	-2.07X	(18.809%)	20.09%	-103.18%	#VALUE!	(120.859%)	-1.22%	-10.11%
CLPT	Clearpoint Neuro Inc	0.2B	-16.12X		22.64%	-73.75%	#VALUE!	(356.948%)	-1.47%	30.06%

Management Commentary

RedMed (RMD) on its priorities….. "Number one, to grow and differentiate our core sleep apnea and respiratory care businesses; number two, to design, develop and deliver market-leading medical devices as well as digital health solutions that can be scaled globally; and number three, to innovate and grow the world's best software solutions for care delivered outside the hospital and especially in the home. The launch and acceptance of our next-generation device platform called AirSense 11 continues to go very well. Patient feedback remains very positive, and we continue to see very strong adoption of our myAir patient app. As the global population continues to grow and age, we estimate that over 590 million people will have COPD by 2050. This represents a 23% relative increase in global COPD numbers from the baseline of 2020. Combined with the estimated 330 million people worldwide that suffer from asthma, these prevalence figures highlight the importance of treating these chronic conditions with our respiratory care solutions."

OptionsHawk Executive Summary & Focus Stocks

Resmed (RMD) is the only large name and is a quality operator giving solid growth at high margins and even seeing upward revisions, so a top name, though already at 25X EBITDA leaves little room for upside. **Inspire (INSP)** is a top small cap with its approach to sleep apnea still at very low penetration and leaving a long runway for growth. None of the other names in this group look all too attractive at this stage.

Devices/Equipment – Diversified Hospital Supplies

Components: JNJ, ABT, BDX, ECL, BAX, STE, WST, PHG, CTLT, TFX, MASI, GRFS, ICUI, AZTA, OMCL, ITGR, EMBC, OMI, AVNS, MLAB, UFPT, UTMD, RANI

International & Private Peers: Coloplast, Getinge AB

Intro

The group has faced a bevy of headwinds but expectations for 2023 have reset and valuations have pulled back to more attractive levels. FX, Supply Chain and Inflation continue to impact bottom lines, but EPS growth seen across the group in 2023. Procedures saw a strong late Q3 pick up in September while hospital staffing remains challenged. Commentary on capital spending remains cautious as hospitals assess budgets in the current market environment. Product cycle stories differ across the group and it is one where there is likely plenty of bifurcation with some companies operating in a tough environment better than others.

Industry Backdrop & Investment Considerations

The global hospital supplies market is estimated at $38B and seen reaching $61.5B in 2024 at a CAGR of 11.8%. The market for hospital supplies is segmented by products such as sterilization and disinfectant equipment, mobility aids and transportation equipment, operating room equipment, disposable hospital supplies, patient examination devices, syringes, and needles. The increasing prevalence of communal diseases in many parts of the world has increased the demand for hospital supplies. This has also resulted in awareness among health workers and the patient population for proper maintenance of hygiene in the hospital premises. The increase in the geriatric population has accelerated the demand for hospital supplies. The rising technology has led to the development of advanced equipment, which can be used in multiple applications.

The group is traditionally viewed from a growth perspective with patient volumes, pricing, and hospital capex key drivers. Product cycle stories have historically outperformed with catalysts that expand the TAM while portfolio restructuring stories leading to better margins and EPS growth also tend to outperform.

Indicators, Metrics & Stock Selection Framework

Medical devices are valued on P/E, EV/EBITDA and EV/Sales with EBITDA Margins and Revenue Growth playing a key role in the multiple.

Valuation & Comps

EV/Sales to ROCE

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Hospital Supplies					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
JNJ	Johnson & Johnson	468.5B	14.15X	4.02%	2.74%	32.00%	3.85%	15.63%	-4.29%	-4.49%
ABT	Abbott Laboratories	194.5B	16.18X	11.46%	-8.74%	23.85%	4.62%	13.85%	8.86%	6.18%
BDX	Becton Dickinson and Co	72.0B	16.31X	6.22%	5.59%	22.03%	#VALUE!	5.53%	-7.36%	-4.66%
ECL	Ecolab Inc	43.5B	18.93X	9.82%	4.83%	13.16%	2.94%	5.95%	-14.67%	1.98%
BAX	Baxter International Inc	26.8B	11.49X	16.4%	1.51%	17.20%	#VALUE!	7.44%	-17.14%	-5.72%
STE	Steris PLC	19.9B	16.82X	6.93%	5.29%	23.77%	#VALUE!	8.44%	6.65%	8.61%
WST	West Pharmaceutical Services Inc.	18.6B	21.05X	15.62%	0.42%	27.14%	1.96%	36.35%	-11.76%	-7.55%
PHG	Koninklijke Philips NV (ADR)	12.8B	10.30X	18.67%	4.72%	4.85%	-0.11%	(12.25%)	-53.41%	-3.90%
TFX	Teleflex Incorporated	11.9B	15.83X	8.9%	4.28%	26.86%	#VALUE!	10.72%	-7.31%	-3.45%
CTLT	Catalent Inc	8.4B	10.06X	13.1%	9.15%	8.41%	3.50%	9.36%	-13.33%	-2.58%
MASI	Masimo Corp	7.9B	19.36X	13.84%	16.87%	14.80%	#VALUE!	29.33%	2.30%	49.56%
GRFS	Grifols SA - ADR	6.8B	14.25X	15.17%	13.40%	#VALUE!	#VALUE!	(0.113%)	-38.26%	13.26%
AZTA	Azenta Inc	4.5B	37.80X	52.06%	12.33%	1.50%	1.55%	(120.101%)	-35.08%	-6.47%
ICUI	ICU Medical Inc	3.9B	15.07X	19.79%	5.98%	12.14%	#VALUE!	14.56%	-33.30%	-6.23%
ITGR	Integer Holdings Corp	2.3B	13.40X	14.14%	8.25%	13.48%	#VALUE!	6.34%	-15.52%	0.91%
OMCL	Omnicell, Inc.	2.2B	13.89X	83.29%	-5.69%	14.01%	#VALUE!	15.67%	-28.35%	-8.08%
EMBC	Embecta Corp	2.1B		(8.134%)	-0.14%	37.38%	#VALUE!	72.19%	-0.41%	-0.39%
OMI	Owens & Minor, Inc.	1.6B	7.72X	9.31%	2.64%	3.34%	9.91%	17.88%	-25.59%	3.42%
AVNS	Avanos Medical Inc	1.3B	10.85X	13.36%	3.38%	13.46%	#VALUE!	4.28%	-6.97%	-2.79%
MLAB	Mesa Laboratories Inc	0.9B	19.77X	11.2%	6.46%	6.80%	4.92%	(0.345%)	-51.30%	26.37%
UFPT	UFP Technologies, Inc.	0.9B	15.25X	11.09%	3.58%	14.13%	#VALUE!	7.72%	44.64%	24.99%
RANI	Rani Therapeutics Holdings Inc	0.4B	-5.89X	5.6%	-100.00%	#VALUE!	#VALUE!	22.46%	-26.29%	#######
UTMD	Utah Medical Products, Inc.	0.4B			#VALUE!	39.98%	#VALUE!	19.74%	0.00%	#VALUE!

Management Commentary

Abbott (ABT) on headwinds and product cycle….. "Obviously, the macro conditions are going to remain challenging, right, Robbie. I don't think that anybody right now as we're planning going into next year, is forecasting that this is just going to ease up, right? So specifically, I would say probably inflation, I don't expect to get better. And I'd say the currency headwinds are very much kind of in play here for next year, right? Those are probably 2 of the big kind of macro kind of impacts for us. But I still see a lot of opportunity for growth as I have been talking about our business and our portfolio. There's a clear path in my mind here for top line growth of high single digits. And you can get there with a variety of looking at across our businesses. So in Medical Devices, we've got a lot of upcoming launches and products that we have launched. So Libre 3, Amulet, Aveir, CardioMEMS, Navitor, we expect to be launching next year here in the U.S. EnSite X, our mapping system, launching a new ablation catheter into the market globally next year also. But we've got a new class of products, I guess, I would call them the Fab 5, looking at TriClip, Aveir, Navitor, CardioMEMS and LAA. These products combined are an annual run rate of about $0.5 billion, growing 50% and those will also receive the kind of investments to be able to kind of drive their growth since I think they're, again, in the early innings of growth for us."

Becton Dickinson (BDX) on tuck-in deals….. "In FY '22, we continued to transform our innovation pipeline with about 60% of our new product development invested in 3 market spaces that are reshaping health care and helping to fuel our growth: smart connected care, enabling new care settings and improving chronic disease outcomes. We believe our current pipeline is the most exciting in the history of the company. In addition, we deployed over $2 billion this year towards 6 tuck-in acquisitions, all of which were allocated towards higher-growth markets. This includes Parata Systems, our largest acquisition since Bard, which is aligned to our focus on smart connected care and enabling new care settings. Parata makes BD the global leader in the fast-growing pharmacy automation market and enables us to provide solutions to help pharmacies address rising costs and labor shortages. Our product launches reinforce our leadership position in our durable core and expand our offering in higher-growth spaces across smart connected care, enabling new care settings and improving outcomes for chronic disease. These launches strengthened our position in strategic areas such as medication safety, immunology research reagents, molecular and point-of-care diagnostics, peripheral vascular disease and incontinence."

Teleflex (TFX) on portfolio focus….. "Some of the business units are faster growing than others. Obviously, a key business unit for us is our interventional urology, where the UroLift product sits. We bought that company in 2017. It had done $50 million the year before. It will do something in the region of $320 million this year. It's been a little bit impacted by staffing shortages in hospitals, and it's also being somewhat impacted by patient throughput in Urology Care. Then you look at our Interventional Access business, our Interventional Access business is a high-single, low double-digit grower accretive Teleflex margins. We have a portfolio of products within Vascular Access where we are market leader in central venous catheters that grows mid-single digits. And we have an OEM division that grows in the high single with good execution into the low double that continues to expand. So the portfolio works, if you were to try and sum up Teleflex in a word, you would -- or in a sentence, you would say we are in that kind of emergent care, nonpostponable care, which quite candidly should serve us well as we potentially head into tougher times and perhaps a recession. The bulk of our procedures are nonpostponable and therefore, in tough economic times, those sometimes procedures get postponed. It's very difficult to postpone a Teleflex procedure."

OptionsHawk Executive Summary & Focus Stocks

This group could see a rebound in 2023 with hospital volumes picking back up. **Steris (STE)** screens as the best value for growth name while having strong margins and is one of the only names seeing estimates revised higher while **Teleflex (TFX)** now at 15.8X is getting cheap as a best-in-class name. **West (WST)** is a former favorite that still looks rich at 21X EBITDA with slowing topline growth. In the next market cap tier none of the names screen too attractive but **Masimo (MASI)** could be a recovery story though still trades 20X. **UFP (UFPT)** was a standout small cap in 2022 and continues to look attractive versus peers with upward estimate revisions. **Embecta (EMBC)** a new name to me looks interesting as a high margin name that makes diabetes products and trades very cheap as a multi-year transition story after a spin-off by BDX.

Devices/Equipment – Consumer Health

Components: DXCM, HLN, ALC, PODD, ALGN, COO, HSIC, XRAY, NVST, BLCO, PGNY, STAA, PDCO, GKOS, TNDM, OM, SENS, SGHT, RXST, AIRS, SDC

International & Private Peers: Straumann, Sonova, Demant, Amplifon, Cochlear, GN Store Nord, ConvaTec

Intro

Recent conference updates in Dental point to continuing challenges in the discretionary dental market (demand softness, softer spending, price deflation due to competition, etc.). DXCM and PODD are both coming off very strong quarters in Diabetes given new product cycles and as access/reimbursement continues to increase – historically the biggest catalyst for growth. The US TAM (Total Addressable Market) is essentially doubling from 4m to 7-8m people as payers start covering the Basal population (uses insulin 1x a day) and access internationally is rapidly expanding with both G7 and DexcomOne. For PODD, full US market launch of O5 is now underway for Type 1 patients aged >2, with O5 driving significantly more customer switches from competitors than Insulet's historical 80:20 mix of new customers from MDI vs. from competitors, with 3Q mix trending at 60:40. Insulet is continuing its focus on driving T2D market penetration, with an imminent FDA submission of a new basal-only Omnipod device, which would expand Insulet's TAM by roughly 3mn in the US alone. In Vision Care, Alcon continues to see building momentum behind the Precision1, DT1, and Total30 lines, with Precision1 remaining the key growth driver while DT1 continues to target the premium lens segment.

Industry Backdrop & Investment Considerations

The Cardiac Monitoring market is currently seen as a \$2.5B market opportunity. The assisted reproductive technology (fertility) market is a \$6.7B market where PGNY is looking to expand coverage and open up an additional \$5B opportunity. The vision care market is massive, expected to reach \$195B by 2026 at a CAGR of 5.1%. In 2020 there was an estimated \$70B spend with \$48B in eyeglasses, \$16B in contact lenses and \$6B in refractive with growing cases of myopia. The Oral care maker is expected to reach \$53B by 2025 at a 3.1% CAGR with better growth in specialty/orthodontist segments. The Diabetes care market is seen reaching \$33B in 2025 at a CAGR of 6.8%.

Indicators, Metrics & Stock Selection Framework

Medical devices are valued on P/E, EV/EBITDA and EV/Sales with EBITDA Margins and Revenue Growth playing a key role in the multiple.

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Consumer Health					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
DXCM	DexCom, Inc.	46.2B	66.91X	22.18%	19.71%	20.89%	0.44%	9.25%	-7.30%	-0.75%
HLN	Haleon PLC	36.4B		5.47%	6.81%	#VALUE!	#VALUE!	7.4%	5.00%	1.78%
ALC	Alcon AG	34.8B	17.63X	12.44%	6.50%	17.06%	0.97%	4.39%	-6.58%	-0.56%
PODD	Insulet Corporation	21.7B	135.72X	40.56%	15.72%	0.85%	#VALUE!	1.87%	-100.79%	1.97%
COO	Cooper Companies Inc	16.3B	18.63X	11.9%	6.31%	22.19%	#VALUE!	7.0%	-11.16%	5.70%
ALGN	Align Technology, Inc.	15.5B	15.83X	15.67%	1.85%	20.22%	2.47%	37.26%	-44.21%	-21.38%
HSIC	Henry Schein, Inc.	11.3B	11.89X	4.98%	1.40%	6.88%	#VALUE!	16.68%	-1.23%	-4.27%
XRAY	DENTSPLY SIRONA Inc	6.8B	11.34X	11.75%	-2.11%	14.68%	#VALUE!	7.94%	-32.30%	-9.70%
BLCO	Bausch + Lomb Corp	5.6B		9.78%	3.22%	14.01%	#VALUE!	4.26%	0.95%	-2.79%
NVST	Envista Holdings Corp	5.5B	12.35X	9.54%	4.79%	18.94%	#VALUE!	5.63%	-4.69%	-3.62%
STAA	STAAR Surgical Company	3.0B	50.50X	48.74%	24.48%	18.02%	#VALUE!	46.88%	22.41%	-3.29%
PGNY	Progyny Inc	3.0B	22.66X	33.48%	32.48%	5.48%	2.62%	51.17%	728.57%	4.05%
PDCO	Patterson Companies, Inc.	2.8B	9.88X	8.44%	3.31%	4.27%	#VALUE!	8.69%	7.55%	-0.33%
TNDM	Tandem Diabetes Care Inc	2.7B	43.21X	67.79%	11.00%	-7.76%	#VALUE!		-357.45%	-5.85%
GKOS	Glaukos Corp	2.2B	-54.90X	(73.999%)	9.93%	-21.45%	#VALUE!	(4.645%)	17.27%	3.58%
OM	Outset Medical Inc	1.2B	-7.51X	(33.548%)	28.90%	-147.69%	#VALUE!	(92.649%)	17.75%	-23.05%
SGHT	Sight Sciences Inc	0.6B	-4.97X	(15.456%)	29.51%	-116.96%	-12.98%	#########	22.67%	0.98%
SENS	Senseonics Holdings Inc	0.6B		(34.731%)	91.66%	-380.12%	#VALUE!	237.11%	-243.75%	1.56%
RXST	Rxsight Inc	0.4B	-4.57X	(24.617%)	66.43%	-126.50%	#VALUE!	(44.294%)	-8.93%	12.27%
SDC	SmileDirectClub Inc	0.2B	-2.99X	(30.572%)	1.12%	-58.36%	-117.33%	(18.839%)	47.12%	-21.30%
AIRS	Airsculpt Technologies Inc	0.2B	5.36X	29.08%	18.25%	-3.54%	455.76%	15.62%	-420.00%	-2.93%

Management Commentary

DexCom (DXCM) on runway, new launch and coverage….“While we expect these primary care relationships to be critical to our long-term customer aspirations, they also help us better serve the intensive insulin-using population in the U.S. today. The domestic core market still has a long runway of growth ahead as we expect the vast majority of the population to adopt CGM to help them better manage their health. This is a game-changing launch. As we often say, G7 takes everything about G6 and makes it better. It has a 60% smaller form factor, 30-minute warm-up time, 12-hour grace period to allow customers to choose a convenient time to change sensors, an improved app experience and more. All of this while building upon the product performance and accuracy that has earned the trust of our customers and clinicians. CMS clearly recognized this potential in 2017 when they became one of the first global payers to cover CGM for people with intensively managed type 2 diabetes, and they appear ready to lead yet again in customer care. In early October, CMS published a proposed local coverage determination that would again meaningfully expand CGM for the Medicare population. Once finalized, this proposal would expand Medicare coverage to include the basal-only population as well as noninsulin-using individuals that have experienced hypoglycemia. This proposal is in direct response to the clinical outcomes demonstrated in our MOBILE trial, where Dexcom proved to meaningfully improve time and range for this population.”

Alcon (ALC) on vision care… “We're also capturing share in the reusable lens category since launching TOTAL30. Recall that this is a $4 billion category and represents approximately 2/3 of wearers. TOTAL30 represents the first major innovation in the reusable market in a number of years, and for the first time, adds water gradient technology to a reusable lens. We plan to expand the TOTAL30 product family with a commercial launch of TOTAL30 for astigmatism early next year. In contact lenses, the market growth for the quarter was difficult to read due to the timing of price increases and inventory movements. Based on the available data, we estimate the overall lens market grew mid- to high single digits in the third quarter. We're encouraged to see current reporting indicate that optometry visits have returned to pre-COVID levels. Against that backdrop, we believe that our contact lens business grew in line with the market. So I feel good about where we are and certainly feel good about growing share, consistently growing faster than market.”

DENTSPLY Sirona (XRAY) on its cautious outlook…. "So on the whole, I think it's appropriately conservative when you consider those factors, the macroeconomic factors, seeing a potential slowdown in elective procedures, which would impact our orthodontics business, impact our implants business. And so we are being cautious in our comments. I think some of our distributors, some of our peers are being a bit more bullish, that's fine. But we want to make sure that we're being appropriately conservative in our comments. I do think with the actions that we're taking in 2023, with some tailwinds coming from the macro environment, whenever that is, so you can use whatever projection you want to use on the macro environment, the combination of those two start to get us back to an upward trajectory on our operating margins and we should start to approach those levels that you're talking about. And hopefully, the FX headwinds, which we've seen, dissipate and actually become a tailwind for us at some point. But it's been significant. Just to give you context, I mean, for this year alone, we're looking at a $300 million impact to the top line and $0.30 of EPS, which is a sizable number for a business our size. So obviously, that's impacting us negatively. And I think at some point, that goes away. No, I'd just say, first and foremost, both of these businesses that we have, Byte and SureSmile are performing well. We've got good momentum. Each of the businesses actually grew sequentially each quarter in 2022. SureSmile, which is our in-office product, has had double-digit growth each quarter in 2022. And we expect to see another strong quarter here in the fourth quarter. And together, they are becoming a more meaningful part of our overall portfolio. Our ortho business today is around $300 million when you annualize the sales between the two product families. So I think you hit the nail on the head, how do you make these businesses more profitable and accretive versus dilutive to our operating margins. And I think there's opportunities that we're looking at to make that happen. But for now, I would just say they're core to what we do. Very attractive from a top line perspective. These are underpenetrated markets. And so the growth rates are very attractive."

OptionsHawk Executive Summary & Focus Stocks

DexCom (DXCM) is the clear best-in-class name in this group with 20% top/bottom-line growth seen ahead while also operating at high margins though it does carry a premium valuation. **Insulet (PODD)** is the other rapid growth name though it carries an even higher valuation. **Align (ALGN)** estimates are coming down sharply as top-line growth struggles and likely remains under pressure. **Cooper (COO)** is a name I continue to favor with a solid combination of growth and high margins while trading 18.6X EBITDA. **Envista (NVST)** is the Dental name preferred as a smaller cap at 12X EBITDA with solid growth seen ahead and strong margins. **STAAR Surgical (STAA)** and **Progyny (PGNY)** highlight the small cap growth favorites while both also now profitable and a more speculative name of interest is **Sight Sciences (SGHT).**

<u>Devices/Equipment – Surgical, Aesthetic & Imaging</u>

Components: ISRG, HOLX, LNTH, MMSI, INMD, TMDX, PRCT, SKIN, ESTA, CUTR, VREX, VRAY, NNOX, RBOT

International & Private Peers

Intro

ISRG is the leader in this group and is coming off a strong quarter with strength in Systems/Placements and Procedures while the Macro/Hospital spending trends remain questions as we see is the case across the entire Medical Device sector. HOLX is also coming off a solid quarter and sees a recovery in the Breast Health business driving upside in 2023 and chip supplies has been its biggest headwind. HOLX also has faced tough comps for its COVID testing exposure. TMDX a strong performer in 2022 with ramping NOP adoption and seeing expansion into 26 centers for Heart, alongside Liver adoption in 12 centers. VRAY is a small name that has seen a ton of bullish options positioning with strong growth seen the next few years on capital placements and increasing recurring-revenue from service contributions. With 58 systems installed worldwide and ~80 systems planned or in the process of installation, ViewRay sees itself as well-positioned for growth acceleration, with tailwinds including an innovative, clinical pipeline; strong commercial backlog and growing market awareness translating into demand; durable revenue growth; and P&L leverage. PRCT is disrupting the benign prostatic hyperplasia, or BPH, surgery market with its AquaBeam Robotic System. INMD is a leader in the large and growing aesthetics market with well protected, best-in-class technologies in minimally and non-invasive body shaping, fat reduction, and skin tightening. LNTH is seeing accelerated adoption of Pylarify, the company's market leading PET imaging agent for prostate cancer diagnostics while having a lot of major opportunities in the pipeline. ESTA a leading breast implant company that plans commercial launch of Motiva into the U.S. market.

Industry Backdrop & Investment Considerations

The global medical imaging market is estimated at $23B and seen rising to $33B in 2024 at a 5.5% CAGR. The growth of this market is primarily driven by the increasing demand for early disease diagnosis and widening scope of clinical applications. Diagnostic imaging market is broadly segmented into six segments—X-ray imaging systems, CT scanners, ultrasound imaging systems, MRI systems, nuclear imaging systems, and mammography systems. Large cap diversified companies are leaders such as GE Health, Siemens Health, Philips, Canon Medical, Hitachi and Samsung.

The Medical Aesthetics market sees 40M laser procedures and 2.5M plastic surgery procedures worldwide annually. The market size is seen growing to $22.5B by 2027 at a 10.45% CAGR. Medical aesthetics is referred to as a branch of medicine that mainly focuses on procedures and techniques to improve and enhance the appearance, texture, and contours of the skin, face, and body. This branch comprises of treatment processes of scars, moles, liver spots, excess fat, wrinkles, skin laxity, unwanted hair, cellulite, spider veins, and skin discoloration. It generally includes reconstructive surgery, oral and maxillofacial surgery, plastic surgery, dermatology, and many others.

The surgical robotics market is seen reaching $13B by 2026 at a 15.4% CAGR. Some of the factors that are driving the use of surgical robotics include high precision and accuracy as compared to conventional procedures, increasing demand for minimally invasive surgery, the increasing prevalence of gynecology, orthopedic disorders, an increasingly aging population, technological innovations, and the rising adaption of surgical robotics among the population.

Indicators, Metrics & Stock Selection Framework

Medical devices are valued on P/E, EV/EBITDA and EV/Sales with EBITDA Margins and Revenue Growth playing a key role in the multiple.

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBIT Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Surgical and Aesthetics					#VALUE!	#VALUE!	#VALUE!		#VALUE!	#VALUE!
ISRG	Intuitive Surgical, Inc.	99.6B	36.99X	15.72%	12.18%	35.61%	1.36%	19.4%	-4.37%	-1.60%
HOLX	Hologic, Inc.	18.6B	15.11X	8.94%	6.86%	27.87%	563.80%	26.62%	-32.42%	-15.51%
MMSI	Merit Medical Systems Inc	4.2B	19.31X	14.58%	4.42%	16.07%	#VALUE!	11.04%	18.35%	1.67%
LNTH	Lantheus Holdings Inc	3.8B	9.16X	34.21%	12.20%	42.72%	1.74%	5.71%	89.11%	29.98%
INMD	Inmode Ltd	3.1B	11.87X	14.46%	16.37%	50.81%	#VALUE!	82.04%	10.21%	6.24%
PRCT	Procept Biorobotics Corp	2.0B	-27.22X	(45.163%)	71.98%	-108.63%	#VALUE!	(530.541%)	-48.04%	119.68%
TMDX	TransMedics Group Inc	2.0B	-75.83X	(66.16%)	54.36%	-21.59%	#VALUE!	(46.193%)	-15.29%	205.48%
ESTA	Establishment Labs Holdings Inc	1.8B	-58.94X	(69.69%)	27.24%	-27.50%	#VALUE!	(91.753%)	147.69%	0.13%
SKIN	Beauty Health Co	1.5B	31.46X	37.91%	21.11%	16.35%	#VALUE!	(244.04%)	-7.69%	11.00%
CUTR	Cutera, Inc.	0.9B	-2166.40X	150.03%	20.97%	-3.11%	#VALUE!	60.5%	-242.31%	-0.12%
VRAY	Viewray Inc	0.8B	-7.54X	(12.622%)	36.52%	-90.28%	#VALUE!	(561.67%)	-12.59%	5.00%
VREX	Varex Imaging Corp	0.8B	7.60X	6.79%	5.05%	12.58%	#VALUE!	7.04%	-4.03%	6.48%
NNOX	Nano-X Imaging Ltd	0.5B		1008.06%	120.38%	-813.33%	#VALUE!	(50.125%)	35.37%	1169.33%
RBOT	Vicarious Surgical Inc	0.3B	-2.29X	19.93%	#VALUE!	#VALUE!	#VALUE!	86.86%	-92.74%	#VALUE!

Management Commentary

Intuitive Surgical (ISRG) on procedure trends and slowing expenses….“Looking more closely at procedures, 20% growth is up from 14% last quarter and above our 3-year compound annual growth rate of 16% during the pandemic. General surgery, our largest procedure category is growing at the fastest rate of any category fueled by bariatric surgery, cholecystectomy, hernia repair and other foregut procedures in the United States. Si trade-ins continued to slow given the decline in remaining trade-in opportunity. Ion placements grew to 50 this quarter, up from 28 last year and 41 last quarter, reflecting continued growth in an early market. Overall, our customers are acquiring systems where there is opportunity for procedure growth. Going into 2023, we expect the rate of growth in fixed expenses to slow as we pursue leverage in our enabling functions and sequence some of our forward investments. For Ion, we submitted our registration application in China, and we obtained German regulatory clinical study approval for ion ablation technology, which starts our clinical journey towards enabling interventions beyond biopsy. Ion procedures grew 211% in the quarter. Turning to our single-port platform, da Vinci SP. Procedures grew 46% year-over-year, with particular strength in Korea, where our SP team launched next-generation SP instruments and our Firefly-enabled endoscope. We also received PMDA clearance in the quarter, market SP in Japan across a broad set of clinical indications similar to the indications SP has in Korea.”

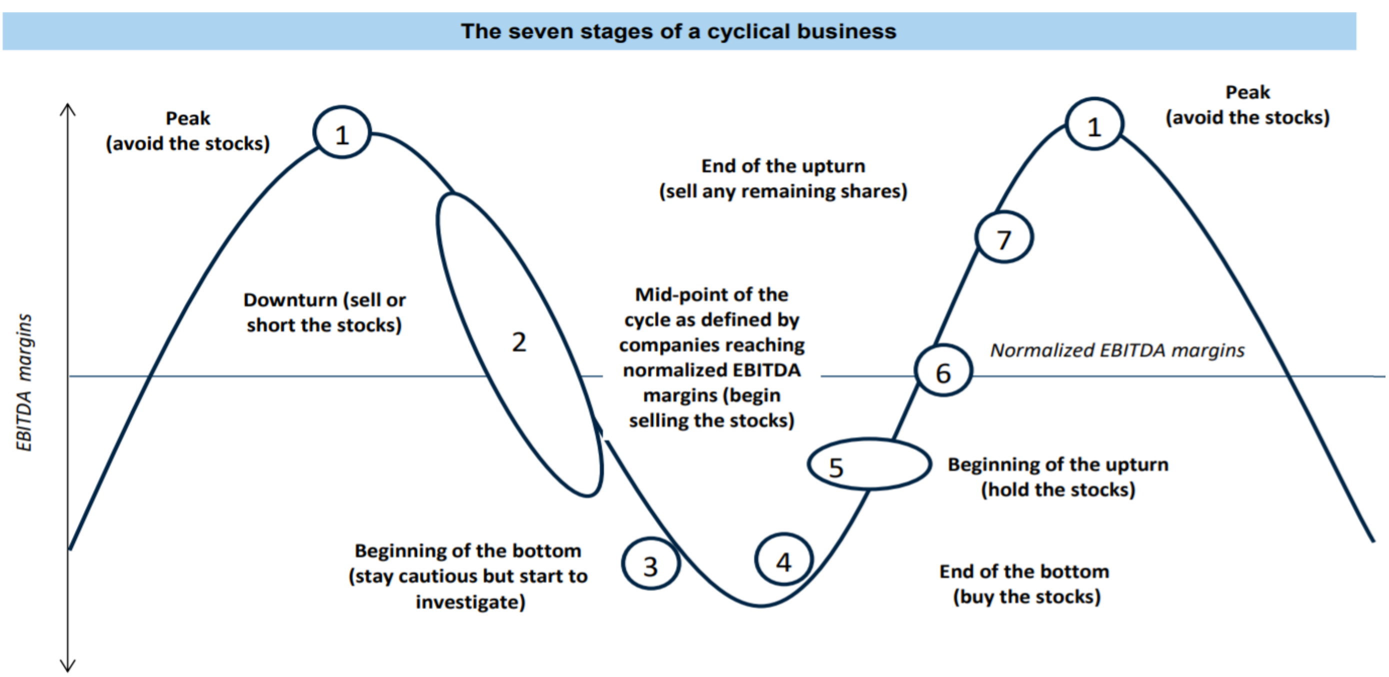
Hologic (HOLX) on 2023, reinvestment and growth…. “As we look ahead, each of our core franchises, listen closely here, diagnostics, breast and surgical are expected to produce low double-digit top line growth for fiscal 2023. We thoughtfully and strategically reinvested our upside earnings into both our business and into our passion to be champions for women's health. Our ability to step up to the plate during the pandemic and address the global demand for COVID testing was an incredible achievement. But our real home run was the transformation of Hologic that cannot be ignored. Through organic and inorganic additions, we now have more growth drivers across our business in each of our divisions than ever before. These growth drivers layered on top of our market-leading core franchises form a solid foundation that anchors our business in these volatile and pivotal times. Focusing on molecular diagnostics, our growth thesis centers on more customers running more volume and more menu on our Panther systems. While we are still in the early days of ramping utilization, we are already seeing positive signs today. With our broad menu, we are well positioned to continue double-digit growth in our core molecular Panther business in 2023. Longer term, our goal is to build both Acessa and Bolder into $100 million plus surgical brands that will complement our market-leading NovaSure and MyoSure products. In Breast Health, we fully expect to exit 2023, achieving low double-digit top line growth from the supply-constrained 2022 comps. We have confidence the worst of the chip shortage is behind us. As chip supply normalizes, as it should over the course of 2023. We expect our gantry business to return to strength. Even with the shortage of gantries we faced in 2022, we maintained our market-leading position in the U.S., grew our presence internationally and have no reason to believe we are giving any ground to the competition. In fact, the backlog for our best-in-class gantries continues to grow, and we continue to receive orders at a healthy rate."

OptionsHawk Executive Summary & Focus Stocks

Intuitive Surgical (ISRG) is the clear leader with the best large cap growth and margins and resilient estimates but still hard to be comfortable at 37X EBITDA, so it fits the bucket of high-quality but not yet at this price. **Hologic (HOLX)** is the other large cap and a quality name now cheap at 15X though estimates coming down sharply likely due to Pantheon from Covid, but fits into the value name bucket. There are a few exciting smaller cap growth names in this group **Inmode (INMD)** and **Lantheus (LNTH)** continue to trade incredibly cheap despite having very strong growth and excellent margins with estimates on the rise. **Procept (PRCT), TransMedics (TMDX),** and **Establishment Labs (ESTA)** are all strong growth stories though fit into the unprofitable and riskier group. Each is a strong story with long runways for growth and worth owning if they can show stronger operating leverage.

Industrial

Key mega-trends include population growth requiring more electricity, energy efficiency, intelligent products and connectivity, and environmental concerns. There are so many diverse markets within the Industrial group that it makes it the most interesting to do deep dives into earnings reports and discover read-throughs for other companies operating in those markets. Some of those markets include Electrical, Hydraulics, Aerospace, Defense, Oil & Gas, Power Systems, Vehicle, Pumps and Flow, Artificial Lift, HVAC, Food Equipment, Automation and Controls, Residential Equipment, Connectivity, Water Systems, Welding, and Tools. This group is more sensitive to the USD and interest rates while capital intensity brings higher credit risk. The group is comprised mainly of cyclical and high capex businesses, so we are focusing more on EBITDA growth and margins and less on the top-line while also paying attention to FCF and capital allocation.



Defense – Defense IT

Components: BAH, LDOS, CACI, SAIC, PSN, TLS, BBAI

International & Private Peers: Alion, Peraton, Salient CRGT, BAE Systems

Intro

Strengthening organic revenue growth was seen in 3Q results across the Government Services space. Book to Bill ratios are coming in strong reflecting a strong awards environment. Bank of America forecasts 9% CAGR in FY23-FY25 for the Defense Modernization budget. There is currently bipartisan support in DC for defense spending, and ’23 is likely to be plussed up to high single digit growth. However, that will create a higher bar off which to keep growing. Civil segments will benefit from the recovery of the commercial air traffic market and increasing opportunities in commercial energy projects. There are also early signs of a strong recovery in Intelligence spending. On a FCF basis, the group trades cheap to the Defense primes with a wider discount than the historical average. Most companies expressed a view that the final 2023 DoD budget will be >$800bn, and then continue to grow from there. However, others recognize the cumulative growth of the last several years creates a high bar and that a flat or slightly lower budget in the medium term is not out of the scenario analysis, especially given broader potential government-wide budget pressures at some point.

The ongoing conflict in Ukraine impacts US military spending through several paths, including 1) direct support to Ukraine, 2) support through US inventories that will have to be replenished in the near term, 3) the US’s leading role in helping NATO countries strengthen their militaries, and 4) the broad acknowledgement that time is of the essence in building up leading military capabilities beyond the current Russo-Ukraine particular conflict.

Industry Backdrop & Investment Considerations

The Government IT Services group has been supported by a strong budget with an overall shift to higher IT spending and system improvements. Areas seeing strong funding include electronic warfare, signals intelligence, and cyber. The estimated TAM is $220B.

The U.S. Federal government spends $90bn+ (excluding classified) annually on a wide range of IT products and services. The market is highly fragmented with the top recipient of contract obligations receiving less than 5% and the top 5 receiving approximately 10%. The fragmented nature of the market can create potential opportunities for larger industry participants to pursue M&A as their primary strategy for value creation. Larger acquirers in this market tend to have the advantage of bringing scale, professionalized management, and shared resources (e.g., contract vehicles) which make the potential target more cost competitive, efficient, and wide-reaching.

IT modernization and an evolving national security threat profile support continued growth in Government IT & Services end markets. Growth market subsets include Cyber Intelligence, Space & Geospatial, Missile Defense, and Connected Communities.

Indicators, Metrics & Stock Selection Framework

When the Defense budget is rising the sector outperforms the S&P500, and vice-versa.

Backlog and book to bill are important leading indicators of sales, but some distinctions should be made. Funded backlog is the highest quality, as contracts are fully funded by the US Government. US National Security IT services companies also report unfunded backlog. This typically includes options or expected exercise of multiyear contract buys that have not been funded. US National Security IT services contractors have an asset-light business model with CapEx mostly related to the purchase of equipment or modernization of investments. They convert between 50% and 80% of EBITDA into Free Cash Flow. Many of their employees work at government locations to keep facilities costs and capital expenditures low.

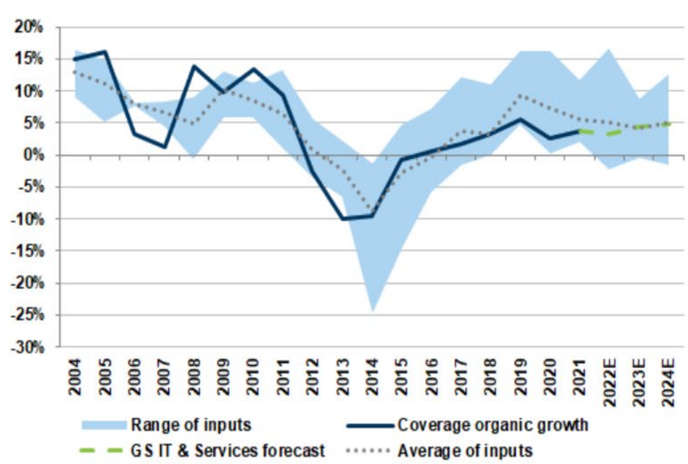
Book to bill is calculated as contract awards, or bookings, divided by sales. However, as well as backlog, not all contract awards are the same quality and have the same impact over time. Usually, contract awards include options or expected exercise of multiyear contract buys that have not been funded. Due to the acquisitive nature of the industry, we focus on EBITDA margins to assess the IT services contractors' profitability. Amortization of intangible assets varies significantly form company to company impacting operating profit. Labor is one of the major direct costs for the US Government service contractors representing ~30% of sales for CACI and almost 50% for MANT. Due to increase competition in attracting qualified employees, direct costs have remained high. In some cases, the IT services providers have to rely on subcontracted labor to meet the contract requirements. Subcontracted labor and third-party materials negatively impact margins. Due to the asset-light business model, most National Security IT services companies strongly focus on cash conversion cycle, in particular accounts receivable, to maximize their FCF conversion. We look at FCF as a % of Sales and Days Sales Receivables as indicators. The most popular method of valuation for US National Security IT services stocks is enterprise value divided by adjusted EBITDA. FCF Yield is an important metric as well due to its low-capital intense profile. Free cash flow allows the companies to invest internally, fund acquisitions, and pursue other strategic capital deployment activities (such as dividends or share repurchases).

Valuation & Comps

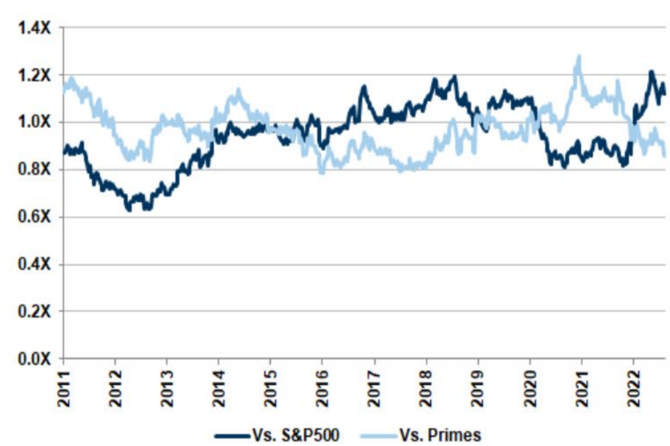
Book-to-bill (BtB)has long been one of the most useful metrics for predicting organic growth as well as measuring a company's business development engine relative to peers. Interpreting BtB is rather straight forward; a company that takes in more contract award dollars (book) than it converts to revenue (bill) over the course of a year will have a BtB greater than 1x and should be able to generate organic growth in the near- to medium-term.

Political party control is a key driver of defense spending, and defense stock valuations can be tied to changes in defense spending related to the modernization (Procurement + RDT&E – research, development, test and evaluation).

Government IT & Services organic revenue vs. range of key drivers



Government IT & Services NTM consensus EV/EBITDA vs. the S&P500 and Defense Primes



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Defense IT					#VALUE!		#VALUE!		#VALUE!	#VALUE!
BAH	Booz Allen Hamilton Holding	13.8B	15.72X	5.82%	7.40%	12.44%	3.26%	12.85%	6.65%	9.61%
LDOS	Leidos Holdings Inc	14.6B	12.79X	7.66%	5.14%	10.31%	6.31%	8.91%	-2.28%	1.57%
CACI	CACI International Inc	7.0B	12.05X	5.83%	4.67%	10.59%	5.69%	9.39%	-1.09%	4.09%
SAIC	Science Applications Internat	6.0B	12.32X	3.04%	1.64%	8.91%	7.65%	8.5%	2.35%	1.58%
PSN	Parsons Corp	4.8B	15.47X	8.14%	7.02%	9.05%	4.56%	8.45%	1.94%	9.46%
TLS	Telos Corp	0.3B	13.54X	134.79%	-13.39%	13.47%	92.57%	34.42%	-29.41%	-11.38%
BBAI	BigBear.ai Holdings Inc	0.1B	-17.93X		13.63%	(9.692%)	-1.00%	(99.677%)	811.11%	-0.38%

Management Commentary

Leidos (LDOS) on its portfolio…. "Of course, what we have been saying for years is we have been portfolio shaping and positioning the company both in health, civil and defense to be in the swim lanes that are moving faster. And so just as I reflect on all 3 of those, of course, our health business continues to have really, really strong momentum. We're almost through the COVID catch-up and back to normative levels, but we see continued growth in our health business, really driven by CMS, Social Security and what's going on in DHA. And it's just been a great performer for us. In Civil, we've talked now for quarters about the resurgence in air travel, and we're seeing strong resurgence certainly in the U.S., as I think all of us can attest and we're finally starting to see the revenue passenger kilometers pick up internationally. And our SES team has had probably more meetings with customers in the last quarter than they did all of last year. So we're traveling again. And that bodes well for increased orders, which will lead to increased sales in our global security business. And then defense, which we actually -- if you think about a year ago, thought was probably going to be our lower growth business. But as we've all come to learn, the world is a very complicated place and it continues to be very, very complicated. And I think those issues require that both the U.S. and our allies continue to invest maybe more than they would otherwise like to in the defense of the nations. And so our defense business has really held up well. I'll highlight 1 other thing. We -- it's a smaller business for us, and we don't often talk about it, but within the Civil group, we have in a commercial energy business. And that has just been going great. We do a lot of engineering for investor-owned utilities and energy savings programs for large production facilities. And that business has been growing in double digits. And it's interesting that utilities are connected to 5G because you put 5G on towers and you need engineering for that. And that business has turned out to be a huge growth engine for us as well."

Booz Allen (BAH) on pursuing cyber-security opportunities…."Our leaders delivered an outstanding quarter of contract awards, resulting in record backlog and a 12-month book-to-bill of 1.32x. We are well positioned. If I could capture the way we look at the future is we have strong organic growth momentum really across all elements of our business. We're investing in the things we said we will invest under VoLT to see growth beyond what's the near-term horizon. Our Tracepoint team does a fair amount of work there, and we'll continue that. We're not seeing sort of going into that type of wide space as a major opportunity. Right now, what we see as the major opportunities are to really double down on this mission technology intersections where we have clear presence, clear mission understanding we're bringing in new technology. But prototype to mission impact is a very long, challenging road. And that's where I think we, as Booz Allen, are doubling down is the ability to not just bring these technologies and show a client what the technology can become. It's actually to make that technology real. And so while there are opportunities in state and local, there's probably opportunities internationally and a number of other places, and we're not oblivious to all of that. Right now, what we're focused is in creating hypergrowth in some designated mission technology intersections."

OptionsHawk Executive Summary & Focus Stocks

Booz Allen (BAH) has the best growth and margins in the group justifying its 20-25% valuation premium and is the best-in-class name. **Leidos (LDOS)** comes in at a close second and trades more in-line with the group valuation at 12.8X. This group remains an attractive way to play the Defense Modernization theme at cheap valuation and steady growth.

Defense – Defense Equipment & Services

Components: RTX, LMT, NOC, GD, LHX, HII, KBR, BWXT, MRCY, MAXR, OSIS, KTOS, RADA

International & Private Peers: Safran SA, Airbus SE, BAE Systems, China North Industries, Leonardo, Thales, Elbit Systems, Almaz-Antey, Rolls Royce, Hanwha, Rheinmettal, Naval Group

Intro

Higher defense budgets and rising geopolitical tensions continue to support a strong outlook for the Defense Primes while the outlay environment remains choppy and supply chain has shown little signs of improvement, putting pressure on near-term results. LMT recently surged after announcing a large buyback and the group has plenty of dry powder to focus on capital returns to allure investors. 2024 is when we begin to see material growth flow into results from higher FY22 and FY23 defense budgets as well as tailwinds from Ukraine military aid. It takes the government 18-24 months to flow through the budget into programs. At that time there also will be less supply chain and labor constraints as well as less EPS volatility from pensions. The base case for defense spending sees modernization funding expanding at a ~6% CAGR FY22-30 (vs. a post-Cold War median 8-year CAGR of ~2%).

After decades of focus on counterterrorism/counterinsurgency and repeated deferral of modernization efforts, the US Defense Department is now undertaking generational investments as it shifts its attention to near-peer (e.g., China, Russia) competition. Workhorse systems are reaching the end of their useful lives and must be recapitalized. At the same time, the nature of global threats has shifted, requiring the Pentagon to reimagine core aspects of its defense posture.

Industry Backdrop & Investment Considerations

Defense stocks remain largely immune to a slowing US or global economy, as they have little to do with the credit markets, the consumer and the broader economy. They have outperformed the S&P 500, on average, during the last five US recessions.

The Aerospace & Defense electronics market is estimated at $140B annually. Advancing digital efforts could unlock $20B in annual EBITDA according to a recent AIA report with both cost and growth opportunities across the value stream—from engineering to supply chain, manufacturing, aftermarket services, and support functions.

The DoD budget remains stable with an ever-evolving threat environment. Modernization remains a key theme across most of the government agencies. Autonomous, Unmanned Aircraft and Digitization are ongoing themes.

The industry already has a playbook from the spending downturn in 2011 and the threat environment remains elevated with North Korea, China, Russia and Iran, so while budgets may be tighter, expect investments to continue into new technologies including advancements in artificial intelligence, biotechnology, quantum computing, space and counter-space, hypersonics, lethal autonomous weapons, microelectronics, cyber, and electronic warfare. This group tends to be tied to politics and investors will be watching for potential tax reform changes as well as updates on R&D tax credit amortization. This group is also exposed to rising interest rates due to pension expenses.

Some key technologies are transforming the industry to driver long-term growth. Advanced Aerial Mobility (AAM) is already being elaborated by industry partners and government agencies and could bring a complete paradigm shift and entirely transform mobility. Hypersonics has focused on hypersonic glide vehicles and cruise missiles. Electric Propulsion is another rapidly growing trend which could reduce carbon emissions, make flights quieter, and decrease costs. Hydrogen powered aircraft are also being developed as Airbus SE announced the development of a zero-emission aircraft that will rely on hydrogen as the primary source of energy and could enter service as early as 2035.

Space Age 2.0 remains an intriguing growth opportunity with the US space market seen growing to $2.7 trillion in 2045 from $340B in 2016.

Indicators, Metrics & Stock Selection Framework

Evaluation of Defense companies uses traditional approached like EV/EBITDA multiples and overlaying EBITDA growth, EBITDA margins and ROIC or ROA. Defense companies are often positioned for long periods of stable earnings & cash flows, so backlog indications are closely watched while Book-to-Bill is a key ratio. We also look at FCF and capital deployment. News flow tends to be dominated by politics along with company-specific contract wins and program pipeline funding.

Valuation & Comps

OCF/Sales to EV/EBITDA

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Defense Prime					#VALUE!		#VALUE!		#VALUE!	#VALUE!
RTX	Raytheon Technologies Corp	146.8B	15.48X	11.41%	7.94%	17.89%	2.71%	3.65%	-1.04%	-2.67%
LMT	Lockheed Martin Corp	125.9B	13.93X	1.34%	0.71%	14.79%	4.83%	19.8%	-19.11%	-1.21%
NOC	Northrop Grumman Corp	80.9B	18.85X	6.24%	4.47%	13.05%	2.08%	15.11%	-0.97%	-0.95%
GD	General Dynamics Corporati	68.3B	15.14X	9.09%	7.00%	13.2%	5.31%	7.11%	0.33%	-0.12%
LHX	L3Harris Technologies Inc	41.2B	13.90X	7.05%	3.73%	20.8%	4.68%	7.02%	-5.08%	-4.29%
HII	Huntington Ingalls Industries	9.3B	12.50X	7.09%	3.57%	8.38%	3.40%	8.46%	-7.12%	-2.61%
KBR	KBR, Inc.	7.1B	12.73X	19.35%	6.84%	10.52%	#VALUE!	10.08%	3.18%	0.06%
BWXT	BWX Technologies Inc	5.5B	15.32X	8.09%	5.10%	19.11%	1.48%	12.95%	-0.79%	2.76%
MRCY	Mercury Systems Inc	2.8B	15.58X	14.48%	7.90%	13.69%	1.00%	7.0%	-20.16%	2.61%
MAXR	Maxar Technologies Inc	1.8B	9.21X	10.47%	10.75%	25.23%	0.64%	1.26%	-235.71%	-6.08%
OSIS	OSI Systems, Inc.	1.4B	8.26X	7.65%	6.10%	12.23%	#VALUE!	12.19%	5.61%	6.37%
KTOS	Kratos Defense & Security Sc	1.2B	19.32X	16.31%	10.63%	8.75%	-5.41%	5.22%	-29.87%	0.21%
RADA	Rada Electronic Industries Lt	2.3B	6.92X	11.45%	4.72%	7.69%	5.38%	44.35%	-7.55%	2197.44%

Management Commentary

Lockheed Martin (LMT) outlook…. "But with residual pandemic impacts and supply chain challenges continuing, we now expect to return to growth in 2024 with 2023 sales being approximately equal to our 2022 outlook. We are confident in our 4 pillars to drive growth in 2024 and beyond. Importantly, we expect to deliver solid growth in free cash flow per share in 2023 and thereafter through a combination of cost reductions throughout the business, improved working capital management and an expanded share repurchase program. Turning to budgets. Both chambers of Congress have advanced appropriation bills in support of fiscal year 2023 Department of Defense budgets. We have seen strong bipartisan support for increased defense funding and congressional authorization and appropriation committees. Final legislation approving these funds has yet to be passed, and the federal government is currently operating under a short-term continuing resolution for FY '23, limiting DoD funding to prior FY 2022 levels. Congress did approve additional supplemental spending to support efforts in Ukraine for the defense of their country. The CR added $3 billion in funding for Ukraine security assistance initiatives, a program to provide equipment, weapons and military support to Ukraine, bringing the total amount appropriated for this effort to $9 billion."

Northrop (NOC) on demand outlook…. "Kathy has touched on both the strong demand environment, our tight alignment with the priorities in the demand environment these days, both domestically and internationally as well as the backlog growth and success we've had in our book-to-bill this year closely related to the strength of the demand environment these days. And so we anticipate that those factors will remain in place over the next several years. Yet to be seen is the pace of easing in some of the supply side pressures that we've also talked about today. We've noted that in '22 and now in our expectations for '23, our growth rate would likely have been higher, if not for the disruption in the supply chain, the challenging labor market conditions that are now beginning to ease, and we've demonstrated some strong headcount growth over the last couple of quarters as a result. But certainly, these pressures continue, and we anticipate that they'll continue in '23. So the pace of easing of those as we look at '24 and beyond will be another macro factor we'll closely monitor. At a micro level, certainly, when we look at our businesses, the opportunity exists for our space business to continue to be our fastest-growing business over the next couple of years. Its backlog growth has been tremendous. The market is growing rapidly in the space domain, and I think we're gaining share in that market, really across mission areas, across domains and across customer sets between our National Security Customer set and on the civilian and even in pockets of the commercial market as well. You noted we've projected that our Aeronautics business will return to growth in 2024. Opportunities exist for growth in all of our sectors in 2024."

OptionsHawk Executive Summary & Focus Stocks

Raytheon (RTX) screens best in this group with the strongest growth outlook, near leading margins and most resilient results at a reasonable 15.5X valuation. **General Dynamics (GD)** also screens favorable to peers in this group with one of the stronger growth outlooks. **KBR (KBR)** is the favored small cap trading cheap at 12.7X while delivering impressive growth albeit at a bit lower than industry-average margins. **Maxar (MAXR)** is a small name that could make a nice acquisition target with strong growth, industry-best margins and cheap valuation.

Aerospace – Aerospace Equipment

Resources: FAA Data, JETNET, Cirium,

Components: HON, BA, TDG, HEI, TXT, ESLT, CAE, WWD, HXL, AJRD, AIN, SPR, RKLB, AVAV, ERJ, AIR, SPCE, VORB, TGI, KAMN, DCO, CIR, ATRO, PKE, ASTR

International & Private Peers: Airbus, BAE Systems, China North Industries, Rolls Royce, Safran, Leonardo, Bombardier, Thales, Dassault Aviation, GKN Aero, Korea Aerospace, SAAB, MTU Aero Engines

Intro

Aerospace OE supply chain bottlenecks remain a hurdle, but demand remains strong. Continued growth in global air travel, positive net pricing power, and an older average in-service fleet is supportive of strong results in aftermarket. For business jets, expect orders to slow from a record pace but remain well above a 1.0X book to bill. Demand for new aircraft remains healthy with >600 net OEM orders in 3Q, as airlines modernize and look to offset elevated fuel costs. Demand for new business jets remains robust despite long wait times and the global macro, with TXT's backlog extending and pricing realization improving.

The overall commercial aerospace market is recovering from the pandemic, but also faces near-term risks related to global growth and supply chain. In large commercial OE, air traffic has recovered substantially, though is now waiting for better international and business travel. Boeing and Airbus have their sights set on higher deliveries, with demand to back it, but supply chain is proving to be a major hurdle. New order activity has restarted, and cancellations have slowed. Boeing recently hosted its first investor day for the company since 2018 with a highly energized and enthusiastic management team that has made a lot of progress to stabilize the company, and now has detailed plans to generate substantial long-term value moving forward. TDG, in aftermarket, has set a conservative 2023 outlook with potential for further pricing increases due to the sustained inflationary environment and upside from China reopening.

Industry Backdrop & Investment Considerations

Air traffic is highly correlated with economic growth, and historically, air traffic has grown at a faster rate than GDP. Boeing and Airbus release order and delivery information on a weekly and monthly basis, respectively, and it is important to keep an eye on order cancellations. Airline net income is a leading indicator of airliner orders. The effect of airline profitability is another interesting factor to analyze in aircraft orders trends. It is fine if the economy is expanding, but it is an entirely different matter if airlines do not have the money to purchase or lease aircraft. Higher fuel prices correlate with higher retirements and lower fuel prices correlate with lower retirements. New aircraft are more fuel-efficient and therefore become attractive alternatives to operating fuel-guzzling aircraft when jet fuel price increases.

New aircraft orders have inflected and cancellations are declining, as airlines commit to fleet modernization as a way to reduce costs, improve fuel efficiency, reduce emissions, and more. The timeline of normalized production rates depend on the global air travel recovery, but airline commitments to new aircraft support a steady ramp-up in production rates even if flight activity is lumpy month to month. Net new large commercial aircraft orders have inflected, led by narrowbody, reflecting both higher gross orders and lower cancellations. Cancellations have been elevated over the past year and a half, but the total backlog is still robust, and near-term delivery slots are filling in quickly, suggesting the market could become tight again in relatively short order, which also supports pricing.

According to the Alton Aviation and AeroDynamic Advisory, the cost of aircraft maintenance, repair and overhaul (MRO) was $83B in 2019 and could grow to $120B by 2029.

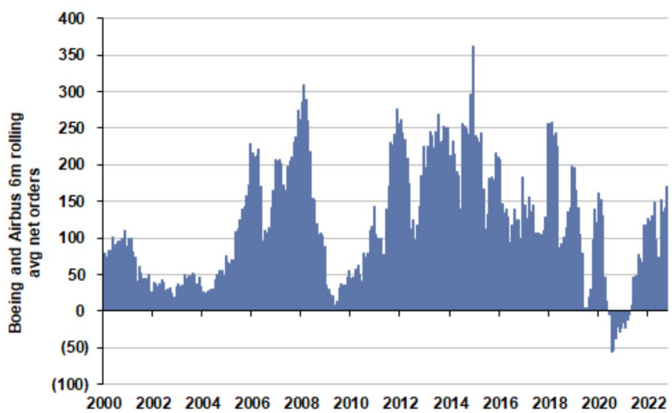
Aerospace aftermarket is a high quality, high return on capital, recurring business tied to an end-market that outgrows global GDP by 2X.

Indicators, Metrics & Stock Selection Framework

TSA Passenger Throughput, US and Global Air Traffic

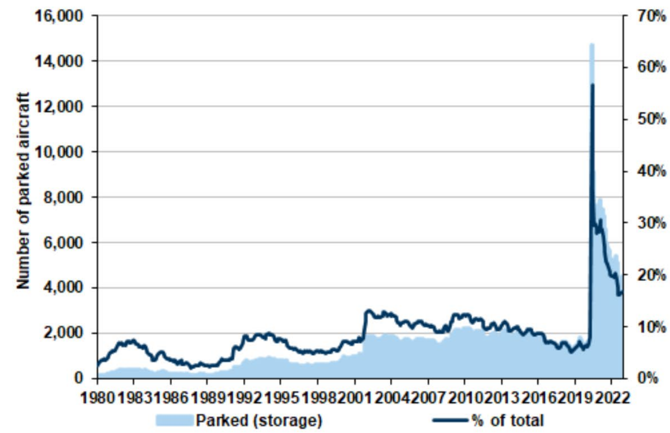
In this group orders and backlog are good leading indicators of earnings. A few key ratios for relative comparisons are EV/EBITDA, Price/Backlog, Price/Book and DCF. Commercial OEMs' book-to-bill ratio, or the number of orders taken versus products shipped and bills sent, is a metric which can impact share price performance. Book-to-bill could be useful in signaling when a sales decline might occur, and in past cycles, peaks in total civil jet orders were followed 1-2 years later by peaks in total deliveries. A potential drawback to relying solely on book-to-bill is that it becomes less robust when backlog duration grows beyond a couple of years. Book-to-Bill has been more useful in the business jet group where backlog has a shorter duration.

Net orders are recovering



Source: Company data, Cirium, October 2022

Parked aircraft as a % of total fleet still high but well off the recent peak



Source: Cirium, October 2022

Valuation & Comps

EV/EBITDA to 3 Year ROIC

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Aero Equipment					#VALUE!		#VALUE!		#VALUE!	#VALUE!
HON	Honeywell International Inc	144.5B	17.79X	8.33%	3.73%	22.52%	3.36%	13.23%	1.71%	-1.64%
BA	Boeing Co	111.5B	-3998.97X	46.06%	22.11%	(14.452%)	1.36%	(15.288%)	-371.60%	-18.40%
TDG	TransDigm Group Incorporat	34.1B	16.84X	10.18%	8.49%	49.8%	3.69%	8.02%	39.45%	13.86%
HEI	Heico Corp	18.7B	32.95X	10.19%	14.54%	26.81%	2.34%	11.96%	-2.68%	2.93%
TXT	Textron Inc.	15.0B	10.67X	5.94%	6.69%	12.64%	7.01%	8.9%	1.27%	-3.87%
ESLT	Elbit Systems Ltd	7.5B	16.39X	14.74%	7.05%	10.53%	-0.57%	10.28%	-20.64%	6.44%
CAE	Cae Inc (USA)	6.6B		23.31%	8.40%	20.8%	#VALUE!	4.64%	12.99%	22.95%
WWD	Woodward Inc	5.7B	15.61X	14.65%	7.63%	14.52%	3.98%	5.15%	-9.60%	7.03%
HXL	Hexcel Corporation	5.0B	19.77X	18.28%	12.90%	19.8%	2.23%	1.03%	3.88%	-1.21%
AJRD	Aerojet Rocketdyne Holdings	4.4B	16.24X	7.14%	5.34%	13.77%	0.92%	(19792.593%)	-14.50%	-4.05%
AIN	Albany International Corp.	3.2B	13.64X	13.07%	4.05%	26.12%	2.38%	9.29%	15.61%	5.25%
SPR	Spirit AeroSystems Holdings,	3.1B	23.06X	41.04%	19.55%	6.95%	-16.56%	(12.986%)	147.50%	0.25%
AVAV	AeroVironment, Inc.	2.2B	25.57X	25.23%	11.06%	6.27%	1.85%	4.45%	7.14%	15.29%
RKLB	Rocket Lab USA Inc	2.0B	-41.97X		34.79%	(10.965%)	-1716.97%	(104.413%)	154.55%	-5.89%
ERJ	Embraer SA (ADR)	1.9B	44.05X	30.23%	15.46%	5.82%	#VALUE!	(0.57%)	171.72%	-17.03%
AIR	AAR Corp	1.6B	8.98X	14.58%	6.82%	9.37%	5.26%	8.0%	23.19%	4.85%

Management Commentary

TransDigm (TDG) earnings call on aerospace trends and capital allocation…"Our long-standing goal is to give our shareholders private equity-like returns with the liquidity of a public market. To do this, we stay focused on both the details of value creation as well as careful allocation of our capital. We continue to see recovery in the commercial aerospace market and remain encouraged by the favorable trends in air traffic. We are happy to see the continuation of the favorable trends in global air traffic recovery with domestic air travel still leading and international air traffic catching up. The majority of countries have fully reopened to international travelers. However, China air traffic lags the recovery seen in other countries. As mentioned earlier, we are exiting fiscal 2022 with a sizable cash balance of approximately $3 billion, which leaves us with significant liquidity and financial flexibility to meet any likely range of capital requirements or other opportunities in the readily foreseeable future. Regarding the current M&A pipeline, we are actively looking for M&A opportunities that fit our model. Acquisition opportunity activity continues, and we have a decent pipeline of possibilities as usual, mostly in the small to midsize range. I cannot predict or comment on possible closings, but we remain confident that there is a long runway for acquisitions that fit our portfolio. Both the M&A and capital markets are always difficult to predict, but specifically so in these times."

Boeing (BA) on long-term turnaround…. "Now I'll lay out for you what we intend to do in the '25 to '26 time frame. Again, primary to metric, very simple, free cash flow. And $10 billion reflects our attention to get this place back to normal post the turnaround back to normal, back to the pre-2019 representation. Underlying that assumption of $10 billion, a couple of important points. Revenue for the company will be approximately $100 billion and operating margins of approximately 10%. And the key components starting with BCA, around 800 deliveries, low double-digit margins and a return to the cash juggernaut you're all familiar with. On BGS, mid-single-digit growth and mid-teens margins. And finally, BDS, low single-digit growth and high single-digit margins. As we close this year, we expect to have around $17 billion of cash on hand. That's between $7 billion and $9 billion higher than historical baselines. We then expect over the period to generate substantial free cash flow that's more in excess of what our debt maturities are. Our debt maturities over the next 3 years around $14 billion. We will continue to generate this cash flow. We'll address the debt maturities. And then any excess cash that we have, we will point towards accelerating debt paydown because investment grade remains a priority for the company. What gets us excited is our backlog. Our backlog is big, it's diverse, it's over $380 billion across our 3 segments: commercial, over $300 billion; defense, $55 billion; services, almost $20 billion. Big, important and to us, this really demonstrates our competitiveness, but it also demonstrates the confidence that our customers are putting in our products. And now it's up to us to deliver on their behalf."

Hexcel (HXL) on the demand environment…. "Our key challenge today is meeting the strong market demand in front of us. Our Aerospace customers are continuing to increase build rates as orders for new planes grow to meet airline requirements for capacity and modern fuel-efficient aircraft. Passenger numbers are growing back rapidly, and in many parts of the world are back to pre-pandemic levels and even higher as pent-up demand like both personal and business travel. The pull for Hexcel lightweight advanced composites remains strong in all of our markets and by all indicators, will strengthen even more in 2023. Hexcel has a sustainable competitive advantage. Excellent customer relationships and leading sole-source positions in key markets with high barriers to entry. With our innovative technology and the broadest aerospace composite product portfolio in the industry, there is no other company in our advanced materials space that is better positioned to take advantage of the growth opportunities ahead in Hexcel. Our Commercial Aerospace customers continue to forecast growth in both narrow-body and wide-body programs where Hexcel has strong positions, reflecting robust domestic passenger demand and growing confidence in the return of international travel. Business jets and regional aircraft sales increased more than 69% in the third quarter of 2022 compared to Q3 2021. As we discussed last quarter, business jets represent a great opportunity for Hexcel over the next few years with launches of new composite-rich business jets. With content on some of the larger business jets nearing that of narrowbodies, we see nothing but opportunity for greater penetration of advanced composite materials, including the potential for more composite wings like the Dassault Falcon 10X and noise reducing advanced composites that are unique to Hexcel's portfolio."

OptionsHawk Executive Summary & Focus Stocks

Boeing (BA) is a top name for the Aerospace recovery and is in a multi-year turnaround that should carry a strong positive news cycle and revisions higher. **TransDigm (TDG)** remains the favored after-market play and now cheap at 17X while delivering strong growth and stellar margins. **Hexcel (HXL)** screens attractive as a higher margin name in the next market cap tier as a composites leader working through supply chain challenges. **Aerovironment (AVAV)** is another quality small-cap that could be an acquisition target. **Ducommun (DCO)** is the smallest name of interest offering solid growth and margins with earnings momentum as headwinds abate.

<u>Aerospace – Leasing & Parcels</u>

Components: UPS, FDX, AER, AL, AAWW, ATSG, FTAI

International & Private Peers: DHL, Kuehne & Nagel, DB Schenker, DSV Panalpina, BOC Aviation, Avolon, SMBC Aviation Capital, GECAS, ICBC Leasing

Intro

The leasing plays are posting strong numbers and have full order books through 2023 on the back of resurgent aircraft demand. The Parcel plays are seeing Macro slowdown weigh after FDX's large miss for their 1Q23 raised concerns for the near-term health of the parcel industry, particularly volumes. Management for UPS noted the path looks different given volume deceleration and sustained higher pricing. The new strategy is focusing on margin expansion rather than chasing volume as well as focusing on scaling small- medium sized business (SMB) to improve mix, and expects Amazon to represent less than 11% of total revenues by yearend. International weakness and intensified competition from Amazon in enterprise remain key headwinds for 2023.

Industry Backdrop & Investment Considerations

The main driver of revenue growth for lessors is rental revenue. Increasing rental revenue is achieved by adding aircraft to the owned fleet. Lessors can also increase revenue via higher management fees which is accomplished by growing the size of their managed fleets. Over time, leasing has become increasingly relevant as an aircraft financing option for airlines globally. Aircraft lessors own 45% of today's global fleet of passenger aircraft versus 16% in 1990 and just 2% of the fleet in the early 1970s.

Indicators, Metrics & Stock Selection Framework

The leasing industry demand is closely tied to aircraft demand which is a result of the secular growth in global airline passengers. Global airline passengers have grown at an average CAGR of 5%, with an almost unbroken upward trajectory each year since 1973 driven by the rise of the middle class in emerging markets. The growth of emerging market airlines can be witnessed in how the makeup of lessees has evolved over time, with a little over 50% of global leased aircraft on lease to emerging market airlines today.

While the aircraft lessors have produced strong margins that have gotten increasingly stable over the last several years, the stocks continue to be volatile as a function of customer credit risk and the relatively short history of the group as publicly traded equities.

One interesting observation is that while higher fuel could be negative for lessee profitability, the stocks have appreciated in periods of rising fuel prices due to higher fuel prices being a potential driver of fleet replacement for the airlines.

In evaluation we will look at EV/EBITDA and Price/Book as a value metrics with the latter important for a capital-intensive business, EBITDA growth, EBITDA Margins and ROE.

Management Commentary

United Parcel (UPS) on the new strategy…. "The execution of our customer first, people-led, innovation-driven strategy has fundamentally improved to nearly every aspect of our business, causing better revenue quality, higher operating margins and improved bottom line results. Building on the strong foundation created by our better not bigger approach, we are moving to the next phase of our strategic framework, better and bolder.

We will continue to focus on growing value share, improving the customer experience and driving higher productivity from the assets we own. Bolder is about moving faster to grow in our targeted market segment. It's also about combining digital solutions with our global integrated network to create more value for our customers and new revenue opportunities for UPS. We will continue to focus on growing value share, improving the customer experience and driving higher productivity from the assets we own. Bolder is about moving faster to grow in our targeted market segment. It's also about combining digital solutions with our global integrated network to create more value for our customers and new revenue opportunities for UPS."

AerCap (AER) on the environment…. "Traffic demand continues to surprise to the upside, and leasing costs form a relatively small part of an airline's total cost. As such, I expect that the environment for aircraft leasing will continue to improve. In summary, this was another great quarter for AerCap with earnings and cash flows remaining strong throughout the business. The market environment continues to improve. And as you'll have seen from this quarter, the financial impact is already beginning to come through. As we sit here now, 12 months on from the closing of the GECAS acquisition, we are optimistic about the future. We have come through COVID, the Russian aircraft write-off and we have still hit our target debt equity ratio ahead of schedule. Hillary, there's no doubt, as we said that lease rates are going up at the moment. That's a function of 2 items. Of course, you have the interest rate increase and you also have the shortage of certain types of aircraft as well. We expect that the shortage of aircraft will persist for quite some time into the future relative to demand. And of course, look, there is still one very large market out there that has not yet opened. But in time, it will, which is the Chinese market, of course. Now we're not saying that will happen today or tomorrow, but over some period of time in the future, it will. And this is a long-cycle business. So you do have to look into the future. An important data point for yourselves is the amount of aircraft that airlines are buying office is higher than ever. The airlines also know the challenges that Boeing and Airbus face. And what they are doing now for the first time, almost 40% of our aircraft sales are to airlines. Airlines are buying airplanes also said they thought they would be exiting a 20-year-old, A320, 737, et cetera. So that's a very good indicator of the likely longevity of the supply issues."

OptionsHawk Executive Summary & Focus Stocks

United Parcel (UPS) is the best-in-class name despite a 40% valuation premium to FDX with its much stronger sustained growth, high ROIC and way better margins. However, I do see headwinds mounting in 2023 which keeps me cautious on both names. **Air Lease (AL)** is a small cap to highlight with a strong multi-year growth outlook as the orderbook continues to improve.

Machinery & Equipment – Ag & Construction

Resources: Farm Equipment, Ag Equipment Intelligence, Off Highway Research, USDA Farm Income, Association of Equipment Manufacturers, USDA WASDE, Purdue University Farm Capital Index and Ag Barometer

Components: DE, CAT, CNHI, TTC, AGCO, VMI, ACA, TEX, LNN, ALG, TWI, CMCO, MTW

International & Private Peers: CLAAS KGaA, Lovol Heavy Industries, Dongfeng (DFAM), Komatsu, Kubota, Hitachi, Kobelco, Liebherr, Manitou, Mitsubishi Heavy Industries, Husqvarna, Keyence, Atlas Copco, Volvo, Sandvik, Massey Ferguson

Intro

The Machinery group has delivered improved price/cost and resilient near-term backlogs due to supply chain challenges. Construction equipment utilization rates have improved in recent months, while used equipment inventories have stabilized at low levels. Margin challenges across the group are likely to moderate in 2023.

Deere expects NA large ag units up 5-10% in 2023. Deere notes that 2023 volumes are likely to still be 20-25% lower than 2010-14 period, the last big replacement cycle. There is a range of outcomes to monitor that can impact the supply-demand imbalance in agriculture – Europe-Ukraine, black sea exports, big planting season – that can dampen the demand for farm equipment. Positive tailwinds such as fleet age, limited inventory build, and balance sheet for farmer remain in place.

Industry Backdrop & Investment Considerations

The global Ag Equipment market is estimated at $130B growing at a 6% CAGR to $167B in 2027 while Precision Ag is seen as a $53.7B addressable market. By type, the market is categorized into tractors, harvesters, soil preparation & cultivation, irrigation & crop processing, agriculture spraying equipment, hay & forage machines, and other agriculture equipment. Depending on automation, it is classified into manual, semi-automatic, and automatic equipment. Considering business, the market is classified into original equipment manufacturers (OEMs) and aftersales.

The Ag Equipment group is closely tied to farmer profitability which supports a replacement cycle and also backed by government subsidies. The ag equipment fleet has aged significantly – the replacement rate of US ag equipment has hit the lowest level since the mid-1980s (following the great farm crisis). The aged fleet, paired with the recent emergence of productivity-enhancing precision ag technologies (Precision Planting, ExactEmerge, ExactApply, Combine Advisor, etc.) that were launched in the last 5 years (trade cycle for equipment ends to be 4-5 years is likely to stimulate greater replacement demand. Demand for agricultural equipment is cyclical, influenced by, among other things, farm income, farm land values, weather conditions, the demand for agricultural commodities, commodity and protein prices and general economic conditions, as well as government policies and subsidies.

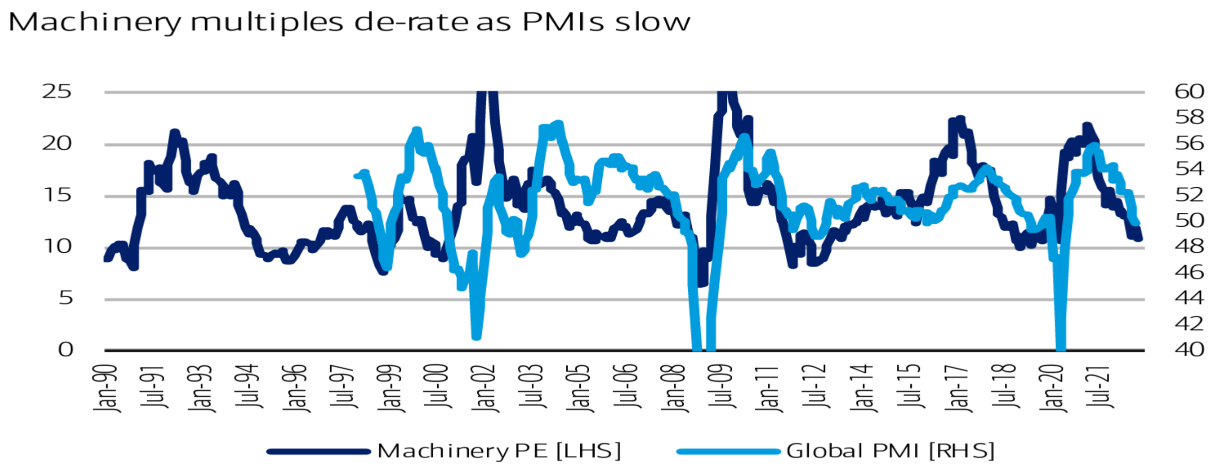
The construction equipment industry was valued near $160B in 2020 and seen growing at a 6.3% CAGR through 2028 to a size of $228B. The construction equipment market has been segmented into earthmoving machinery, material handling machinery, and concrete and road construction machinery on the basis of product.

Technology is in the early stages of disrupting Equipment industries with key themes being Connectivity, Robotics, Future Fuels, Automation and Electrification. Machinery is in a new normal with a structurally better set-up as higher margins are expected while aftermarket and services have become larger portions of revenues. Execution has steadily improved across the industry with better cost decisions and more disciplined distribution and dealer channels. The sophistication of technology embedded within the machines and new equipment is enabling greater customer intimacy, in turn, driving shorter trade cycles. First time buyers are now seeking to flip equipment after only 2-3 years of ownership to trade up for disruptive technologies, software and a much more productive solution.

Indicators, Metrics & Stock Selection Framework

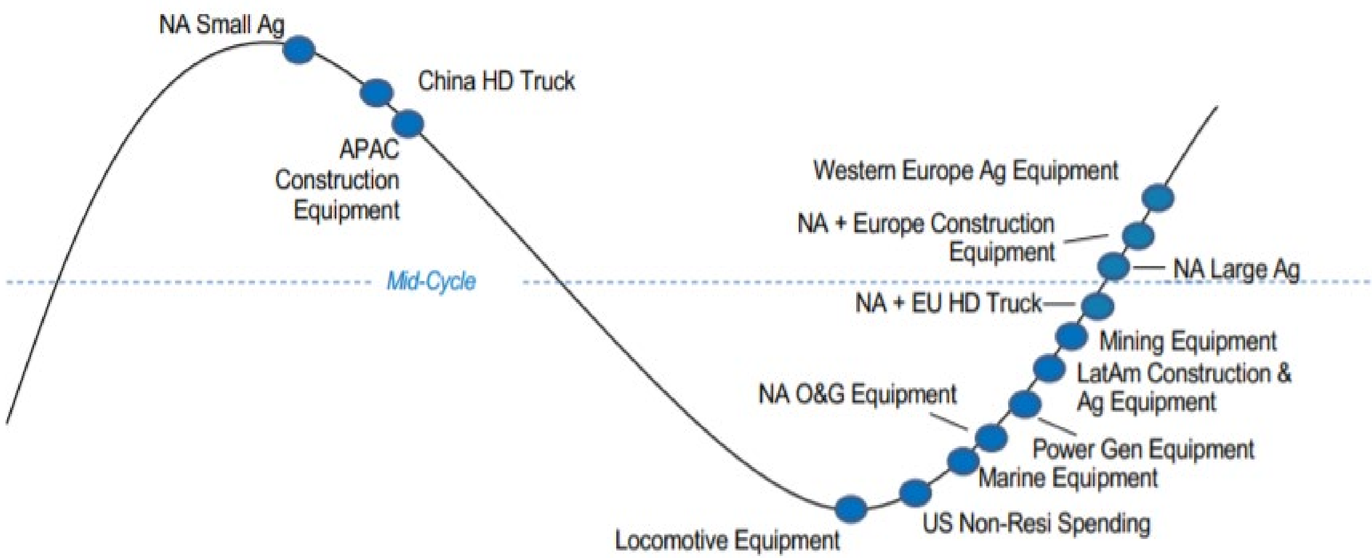
We value Industrial Equipment names using EV/EBITDA and look at metrics like EBITDA margins, EBITDA growth, FCF Yield, Organic Revenue Growth CAGR and ROIC.

Order Intake, Backlog, Dealer Inventories, Crop Cash Receipts



Valuation & Comps

This is a very cyclical group and we can see a nice view of where we are versus prior peaks and troughs:



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Ag & Construction					#VALUE!		#VALUE!		#VALUE!	#VALUE!
DE	Deere & Company	132.0B	7.77X	(0.461%)	3.27%	25.68%	5.59%		23.07%	13.00%
CAT	Caterpillar Inc.	122.6B	14.61X	4.47%	5.50%	20.17%	4.06%	8.92%	15.37%	2.27%
CNHI	CNH Industrial NV	21.7B	14.92X	4.11%	5.35%	12.87%	2.12%	5.9%	5.84%	2.47%
TTC	Toro Co	11.7B	17.97X	4.82%	10.51%	16.36%	2.73%	19.58%	3.73%	1.34%
AGCO	AGCO Corporation	10.0B	7.72X	0.59%	4.18%	12.76%	3.63%	11.53%	2.29%	1.87%
VMI	Valmont Industries, Inc.	7.1B	14.60X	4.91%	7.00%	12.66%	3.96%	10.47%	8.82%	9.45%
TEX	Terex Corporation	2.9B	7.72X	2.53%	4.62%	11.82%	3.95%	12.22%	5.38%	0.59%
ACA	Arcosa Inc	2.8B	10.44X	7.23%	-2.96%	15.04%	#VALUE!	3.65%	26.16%	3.48%
LNN	Lindsay Corp	1.9B	15.29X	8.87%	3.17%	17.37%	4.77%	13.92%	42.34%	15.43%
ALG	Alamo Group, Inc.	1.8B	11.04X	8.08%	5.45%	37.92%	#VALUE!	8.25%	-1.82%	2.93%
CMCO	Columbus McKinnon Corp.	0.9B	8.76X	0.56%	-0.49%	16.85%	6.54%	8.38%	1.78%	5.25%
TWI	Titan International Inc	0.9B	4.80X	(14.971%)	2.87%	11.53%	#VALUE!	9.31%	90.95%	7.98%
MTW	Manitowoc Company Inc	0.3B	5.44X	6.55%	-2.55%	5.28%	31.51%	3.36%	-48.25%	-5.76%

Management Commentary

Deere (DE) on performance and key indicators…. "Across our businesses, performance was driven by continued strong demand, higher production rates and progress on reducing our inventory of partially completed machines. Looking ahead, ag fundamentals remain positive, continuing to drive healthy demand as evidenced by our order books full into the third quarter of fiscal year 2023. Industry sales of both earthmoving and compact construction equipment in North America are expected to be flat to up 5%. End markets overall are expected to remain steady as oil and gas, U.S. infrastructure spend and CapEx programs from the independent rental companies offset moderation in the residential sector. Global forestry markets are expected to be flat as stronger European demand continues to be limited by the industry's ability to produce and demand in North America begins to subdue. Global roadbuilding building markets are also expected to be flat. Demand remains strongest in the Americas, while Europe is softening and Asia remains sluggish. As I look ahead to fiscal year 2023 and beyond, I truly believe our best years are still ahead of us. In the near term, order books across our businesses are full into the third quarter. And it's important to note that not only do the order books continue to fill when we open them, but the velocity of orders has remained strong."

Toro (TTC) on its outlook …. "First of all, the underground market is a big driver for us, currently, and we expect that to be a strong driver well into the future. That's driven -- in 2019, we really talked about it being driven by the implementation of the 5G build-out or the 5G build-out, which is still probably only about at the 20% level. Whether it's the clean energy, grid build-out, charging stations, wind power, solar, all of that has to be connected back to the power grid, and it's all done with our equipment. Golf is the healthiest it's ever been. I've been with the company for 36 years, and it's the best time ever for golf right now, and including forward-looking. We know that there was obviously a boost during the COVID period. But even as that has really waned, the fundamentals of golf are better than ever. Golf courses are healthy backlogs for privates. Private golf courses are at a high, and new people entering that sports of different demographics and different ages really gives us a lot of confidence for the future."

OptionsHawk Executive Summary & Focus Stocks

Caterpillar (CAT) is the top name despite trading at 2X the **Deere (DE)** multiple the thinking here is often counter-intuitive as Deere is hitting peak cycle earnings and CAT has a netter growth outlook and also seeing upward revisions with strong margins to the peer group. **Toro (TTC)** remains a quality name but a bit pricey on valuation. **Lindsay (LNN)** at 15X is a bit rich but screens as a top small cap with durable growth, high margins and very strong upward revisions. **Alamo (ALG)** is a small cap grower with very high margins as a potential M&A target.

Machinery & Equipment – Equipment Rental & Leasing

Resources: Construction News, American Rental Association, For Construction Pros,

Components: URI, WSC, HRI, MGRC, HEES

International & Private Peers: Ashtead, GAP Group, Kanamoto, Tenderd, Klarx, YardLink

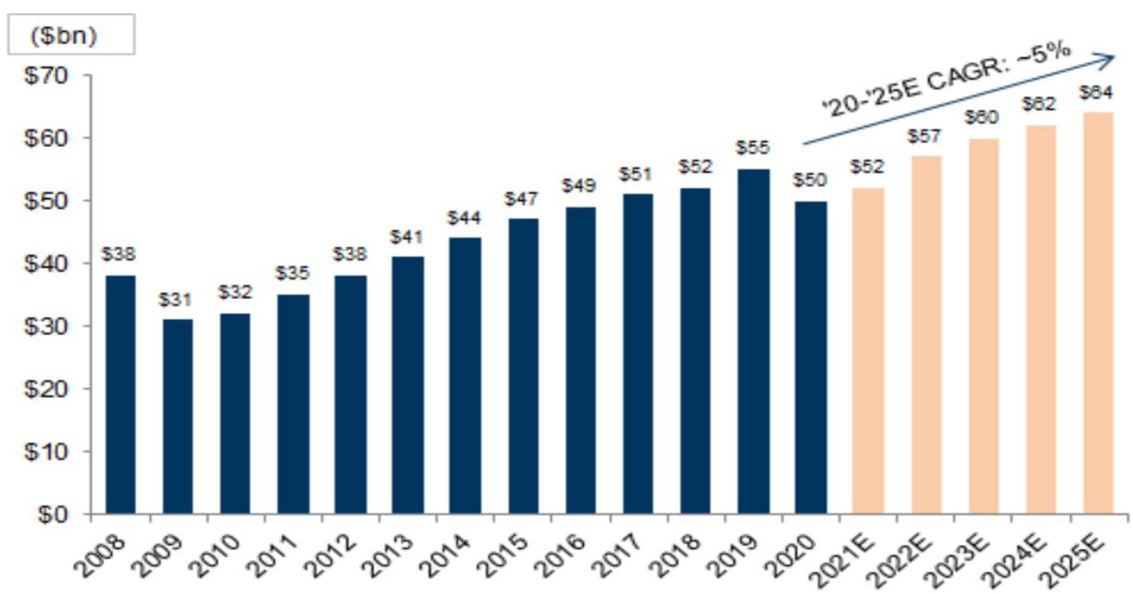
Intro

Equipment rental companies were benefiting from broad-based demand across its end markets, including accelerated recovery in construction and industrial demand, favorable supply/demand conditions, rates and utilization momentum, and elevated used equipment pricing. The Infrastructure spending deal should also be a positive driver for these businesses over the medium term, with benefits to come as early as 2023 per management commentary.

URI's EV/EBITDA multiple has historically shown the strongest correlation with used pricing on a ~6-9M lead. RBA's latest used equipment update underscored an increasing level of deceleration across both Aerial Equipment & Earthmoving auction pricing. US Aerial Equipment pricing has decelerated from a mid-to-high 20% growth rate in April/May (and +42% in Feb '22) to just +3% Y/Y in September's reading.

Industry Backdrop & Investment Considerations

The trend towards renting vs. owning construction equipment will continue gathering momentum as contractors seek to improve their productivity through greater capital efficiency (higher utilization) and a lower fixed cost burden. Historically, downturns/crises have been positive catalysts for penetration growth, and rental penetration is poised to grow from 55% to 70% over the next decade. The equipment rental market is forecast to grow to $63B in 2025 from $51B in 2020 with secular trends favoring rental versus ownership and Healthcare, Warehouse and Infrastructure strong drivers of growth. With labor costs continuing to rise and slow economic growth in major economies like China and India, renting equipment instead of buying new machinery is a good way for construction firms, builders and subcontractors to reduce overhead costs.



The growth and financial health of the North American equipment rental industry is driven by a number of factors including economic trends, non-residential construction activity, capital investment in the industrial sector, repair maintenance and overhaul spending, government spending and demand for construction and other rental equipment generally, including for remediation and re-building efforts related to natural disasters.

The construction market is one of the primary indicators that influence the activity level of the equipment rental market. The recent increase in infrastructure development attributes significantly to the increase in equipment rental. Weather has a significant impact on both construction and rental industry.

Indicators, Metrics & Stock Selection Framework

We value Equipment Rental companies similar to the Equipment names with EV/EBITDA, EBITDA Margins, Net Leverage, Utilization Rates, ROIC, FCF Yield and Organic Growth all key metrics.

Architectural Billings Index (ABI), Dodge Momentum Index (DMI)

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Rental and Leasing					#VALUE!		#VALUE!		#VALUE!	#VALUE!
URI	United Rentals, Inc.	25.4B	6.37X	5.52%	11.44%	49.85%	5.15%	10.87%	21.13%	6.42%
WSC	Willscot Mobile Mini Holding	9.7B	13.60X	9.77%	7.42%	41.6%	3.31%	3.92%	30.13%	13.81%
HRI	Herc Holdings Inc	3.9B	5.39X	4.11%	20.29%	46.3%	-3.63%	8.13%	-4.11%	6.25%
MGRC	McGrath RentCorp	2.4B	10.16X	6.28%	4.23%	36.53%	#VALUE!	4.57%	6.32%	5.54%
HEES	H&E Equipment Services, Inc	1.7B	5.30X	6.93%	15.75%	42.99%	#VALUE!		39.48%	4.66%

Management Commentary

United Rentals (URI) on the industry…. "While there are portions of the economy that are clearly slowing, in our industry, customer activity is still on the upswing and demand for our equipment rental continues to be very strong. Customer sentiment and key industry indicators remain positive. And we know this outlook may seem at odds with some views on the broader economy. And if we saw a cause for concern in our markets, we'd be standing here talking about it. We'd also be using the flexibility built into our model to pivot to a more conservative stance. Instead, we're investing in the tangible opportunities that we see ahead. Here are a few of the unique dynamics that should help our industry continue to outpace the macro in virtually any economic cycle. One is a $550 billion of funding in the U.S. infrastructure bill, which will finally put shells in the ground starting in '23. This should trigger at least 5 years of opportunity. There's another $440 billion of federal tax incentives in the Inflation Reduction Act for clean energy and plant upgrades. And we think these will have a 5- to 10-year impact. Investments are already underway in automotive electrification, microchip factories and the broader trend towards onshoring. And there's also more focus on energy production to serve markets in North America and Europe. Many of these tailwinds are new to the construction and industrial sectors. And in combination, they're a major opportunity for our industry."

WillScot (WSC) on demand environment…. "Switching gears to demand, which continues to be broad-based and robust across our end markets other than some softening in Canada as well as U.S. residential builders and developers, both of which were discussed during our Q2 call. Other aspects of the diverse portfolio are effectively mitigating these 2 more minor contributors. The Architectural Billing Index has remained positive since February of '21, and which, combined with our customer sentiment, supports our confidence in continued robust nonresidential demand well into 2023. We are already actively servicing major reshoring and onshoring mega projects. These are large complex long-duration projects which require a correspondingly complex, Modular and Storage solutions. With our scale and sophistication, we're uniquely positioned to compete for these projects, which began even before the chips or inflation reduction acts were passed. Infrastructure spending will also continue to be a tailwind. We're just now beginning to see project activity that we can trace back to the federal investment. So all in, we're confident in the trajectory upon which we enter 2023, and we continue to invest aggressively given, first, we see objective sources of strength in our end markets as evidenced by the ABI customer sentiment onshoring and reshoring of industrial manufacturing and tailwinds from infrastructure spending. Second, we have the strongest leasing run rate in our history with rapidly accelerating free cash flow. Third, we're demonstrating undeniable progress executing across our $1 billion of idiosyncratic growth levers and finally, we are methodically executing our programming tuck-in acquisition strategy to further pump compound growth."

OptionsHawk Executive Summary & Focus Stocks

United Rentals (URI) annually is a top pick and I continue to like its opportunity while trading 6X EBITDA with strong margins and rising estimates, an excellent name. **H&E (HEES)** screens positively with strong growth and margins and sharply rising EPS estimates, also cheap at 5X, so a top small cap and potential M&A target.

Machinery & Equipment – Multi-Industrial & Food

Components: GE, MMM, ITW, ETN, PH, AME, FTV, IR, DOV, IEX, RRX, MIDD, CW, CR, SPXC, HI, JBT, KAI, B, SXI

	End Market Sales Exposure											
	Industrial	Non-res	Resi	Heavy Truck	Auto	Aero & Defense	O&G	Power Gen. / Renewables	Consumer	HVAC	HC	Other
ALLE	0%	70%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CARR	0%	0%	0%	0%	0%	0%	0%	0%	20%	50%	0%	30%
CFX	33%	21%	0%	0%	0%	0%	0%	10%	0%	0%	37%	0%
CNM	0%	37%	18%	0%	0%	0%	0%	0%	0%	0%	0%	45%
CGNX	0%	0%	0%	0%	30%	0%	0%	0%	55%	0%	0%	15%
DOV	19%	5%	0%	7%	12%	0%	5%	0%	44%	0%	2%	7%
EMR	32%	10%	0%	0%	0%	0%	21%	9%	7%	16%	0%	5%
ETN	0%	41%	6%	9%	7%	17%	9%	0%	0%	0%	0%	11%
FLS	46%	0%	0%	0%	0%	0%	36%	14%	0%	0%	0%	4%
GE	0%	0%	0%	0%	0%	38%	0%	39%	0%	0%	23%	0%
GGG	19%	24%	21%	4%	10%	0%	9%	0%	0%	0%	0%	13%
HON	24%	15%	0%	1%	0%	36%	18%	0%	0%	0%	0%	6%
IR	31%	0%	0%	4%	3%	0%	15%	0%	20%	0%	4%	23%
ITT	31%	0%	0%	0%	41%	14%	10%	0%	0%	0%	0%	4%
ITW	28%	0%	7%	2%	20%	0%	0%	0%	43%	0%	0%	0%
JCI	0%	43%	0%	0%	0%	0%	0%	0%	4%	52%	0%	1%
KMT	46%	0%	0%	14%	17%	7%	16%	0%	0%	0%	0%	0%
LII	0%	25%	61%	14%	0%	0%	0%	0%	0%	86%	0%	-86%
MIR	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%	0%
MMM	23%	1%	0%	0%	7%	3%	0%	0%	45%	0%	22%	0%
NVT	44%	27%	14%	0%	0%	0%	15%	0%	0%	0%	0%	0%
PH	30%	10%	3%	2%	6%	25%	2%	5%	7%	0%	0%	11%
RBC	35%	13%	0%	0%	0%	0%	7%	0%	9%	24%	0%	12%
ROK	35%	0%	0%	0%	10%	0%	10%	0%	25%	0%	5%	15%
ROP	22%	17%	12%	0%	0%	0%	7%	3%	0%	0%	23%	17%
RXN	27%	25%	6%	0%	5%	9%	0%	7%	11%	0%	0%	10%
SWK	14%	30%	43%	0%	11%	0%	0%	0%	0%	0%	2%	0%
TKR	31%	12%	0%	11%	7%	9%	5%	11%	0%	0%	0%	14%
TT	0%	0%	0%	19%	0%	0%	0%	0%	0%	81%	0%	0%
VNT	34%	0%	0%	0%	20%	0%	0%	0%	44%	0%	0%	2%
Average	**22%**	**15%**	**8%**	**3%**	**6%**	**5%**	**6%**	**3%**	**10%**	**11%**	**6%**	**5%**

International & Private Peers: Mitsubishi, Itochu, Mitsui, Jardine Matheson, MTR Corp, CITIC, Ferrovial

Intro

The Multi-Industrial subgroup covers companies with a variety of end-market exposure including some key markets like Industrial, Residential, Auto & Transports, Buildings, Aerospace & Defense, and Energy/Chemicals. These are not pure plays and instead have a diverse set of exposure to various markets. We look more closely at each of these end markets and the important considerations throughout other sections of this report. It is important to pay attention to the end-market exposures to assess rotating within this group to names in stronger end-markets.

Volumes, inventories, pricing power, and head count are all higher risks for short-cycle industrials. Electrification, Automation and HVAC/Decarbonization remain secular growth themes. Capex is not overheated and expectations for 2022/2023 capex continue to be strong even as macro conditions become choppy. Capex is geared more toward supply chain and productivity and less on raw capacity where production levels would drive cancellation risk. The numerous sources of US fiscal stimulus from IIJA to IRA to Chips Act should be strong tailwinds for the next several years. October ABI came in at 47.7, a pretty steep drop from 51.7 in September, which is the first sub-50 reading since January 2021. For reference, the Architecture Billings Index (ABI) is a diffusion index that serves as a leading economic indicator for non-residential construction activity by ~9-12 months.

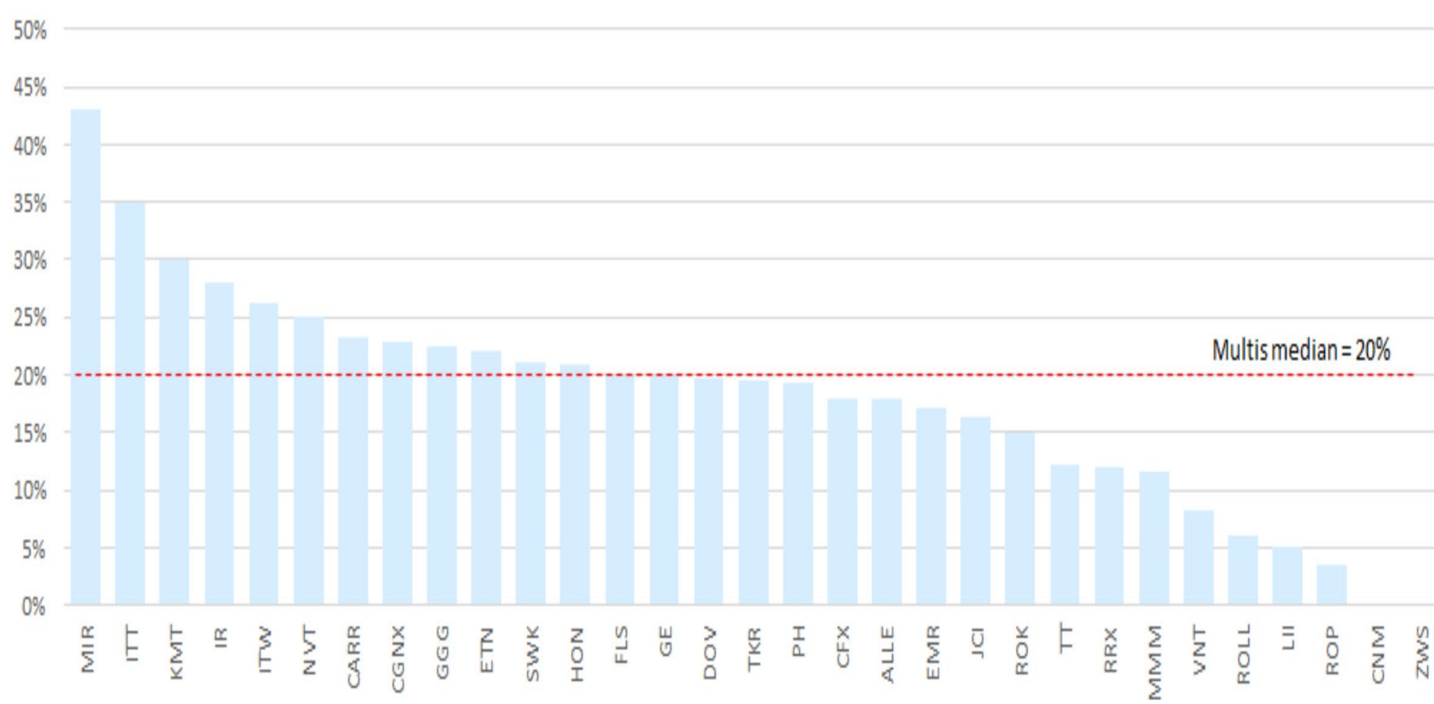
Industry Backdrop & Investment Considerations

This is a cyclical group that is closely tied to ISM Manufacturing and the overall strength of the Industrial economy. Multi-Industrials have tended to outperform other Industrial companies with ISM in the 45-50 range but that outperformance tends to taper as ISM goes above 50 as investors prefer to own Multis at the cycle trough.

Some of the best growth trends can be found with durable ESG trends such as Decarbonization, the Electrification of Heat and IAQ/Healthy Buildings. By 2025, most industrial companies are likely to have automated their supply chains and assembly lines and be employing big data. There will also be a degree of artificial intelligence, adaptive manufacturing, and/or potentially demand-driven production. The benefits will be better operating margins and asset utilization, and increased productivity. SaaS and data analytics are likely to enhance service offerings through additions such as predictive maintenance.

Exposure to Europe has been a recent concern:

Multis sales exposure to Europe (GSe)



Indicators, Metrics & Stock Selection Framework

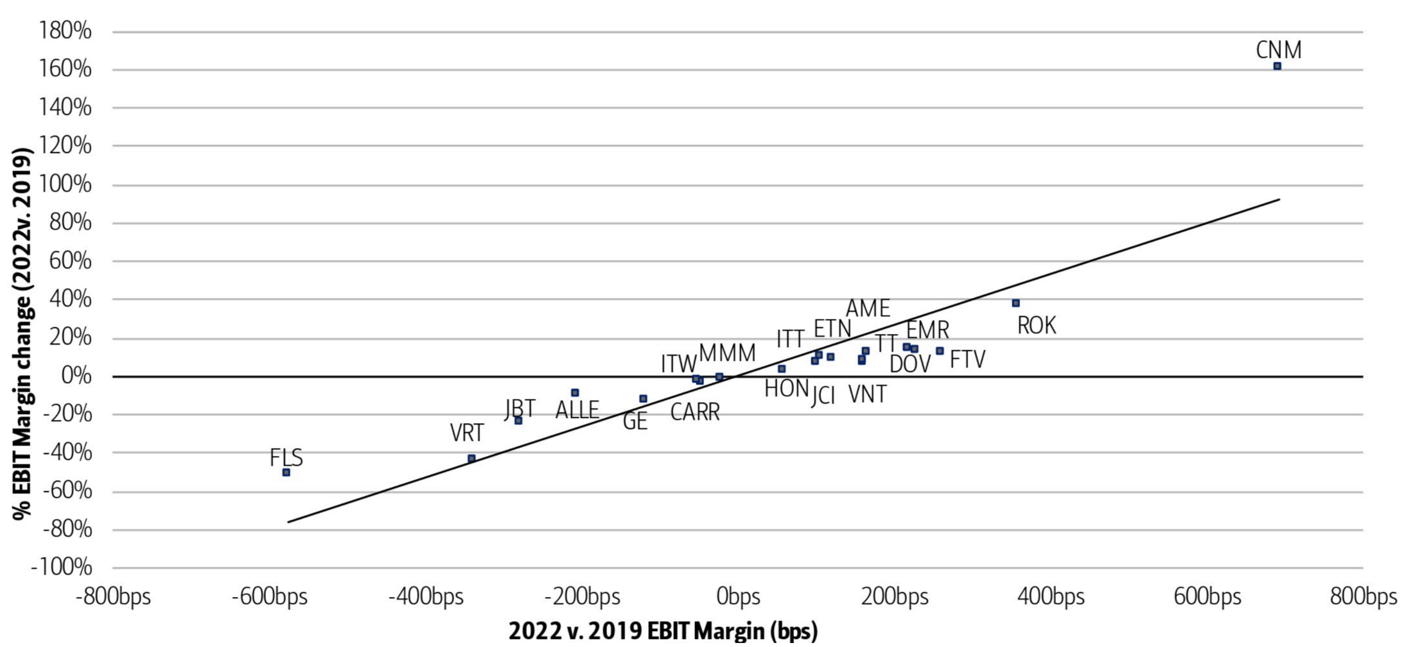
The Multi-Industrial group can be valued like a traditional Industrial utilizing EV/EBITDA multiple and assessing FCF Yield, ROIC, Organic Revenue Growth, EBITDA growth and EBITDA Margins. Inventory metrics can also provide insights while Debt/EBITDA is the leverage ratio to observe. Multiple expansion is tied to the top revenue growers more than the margin expanders.

Valuation & Comps

EV/EBITDA to EBITDA Margins

				Revenue Growth (%)			Operating Margin (%)			EPS Growth (%)		
	Ticker	**Price**	**Price Obj.**	**2021**	**2022E**	**2023E**	**2021**	**2022E**	**2023E**	**2021**	**2022E**	**2023E**
3M	MMM	$128.00	$120	9.9%	-3.0%	1.2%	22.2%	21.1%	21.3%	15.5%	-4.3%	1.3%
Allegion	ALLE	$113.99	$95	5.4%	13.5%	8.8%	18.2%	18.7%	19.7%	1.5%	3.2%	11.7%
AMETEK	AME	$142.08	$144	22.2%	10.3%	4.0%	23.6%	24.4%	24.9%	22.7%	13.7%	2.4%
Carrier	CARR	$44.16	$50	18.1%	-1.0%	5.8%	13.7%	14.3%	13.7%	36.2%	4.0%	8.3%
Core & Main	CNM	$21.34	$31	37.4%	31.1%	-0.6%	8.5%	11.2%	9.7%	N/M	N/M	-18.1%
Dover	DOV	$142.76	$165	18.3%	7.1%	2.7%	16.9%	17.1%	17.8%	34.9%	10.4%	4.5%
Eaton	ETN	$165.36	$180	9.9%	5.2%	7.8%	12.3%	14.6%	15.8%	35.0%	11.8%	10.3%
Emerson	EMR	$95.89	$110	8.3%	6.3%	3.8%	18.3%	18.8%	18.8%	28.6%	10.8%	5.5%
Fortive	FTV	$67.89	$85	-19.5%	10.2%	3.4%	23.1%	24.3%	24.7%	-10.0%	12.7%	3.6%
General Electric	GE	$87.87	$95	-2.3%	1.5%	8.9%	6.8%	8.1%	10.9%	N/M	23.3%	N/M
Honeywell	HON	$218.91	$235	5.4%	3.6%	3.6%	22.4%	22.5%	22.5%	13.4%	8.9%	4.8%
Illinois Tool Works	ITW	$228.68	$240	15.0%	9.2%	-0.2%	24.1%	23.6%	24.0%	28.5%	5.5%	-0.2%
John Bean Technologies	JBT	$91.68	$85	8.1%	15.2%	6.3%	9.4%	8.8%	8.8%	0.9%	19.1%	5.0%
Johnson Controls International	JCI	$66.95	$85	9.6%	5.4%	4.1%	11.4%	11.6%	12.8%	20.8%	12.5%	16.3%
Parker Hannifin	PH	$306.35	$315	11.3%	10.7%	8.0%	18.5%	18.8%	20.7%	29.2%	11.4%	N/M
Pentair	PNR	$45.95	$39	24.8%	8.7%	0.5%	18.2%	18.6%	17.7%	36.0%	5.1%	-5.5%
Rockwell	ROK	$266.61	$275	10.3%	9.7%	9.2%	17.3%	17.7%	20.1%	13.8%	5.4%	24.1%
Vontier	VNT	$19.40	$30	10.6%	3.7%	-6.1%	21.5%	20.5%	19.4%	16.7%	11.8%	0.9%
Vertiv	VRT	$13.86	$12	14.4%	14.4%	10.1%	6.5%	4.3%	8.1%	-7.0%	-26.2%	0.0%
AVERAGE				**13.2%**	**7.9%**	**4.4%**	**15.2%**	**15.2%**	**16.3%**	**18.0%**	**7.3%**	**7.2%**
MEDIAN				**10.6%**	**7.3%**	**4.1%**	**16.0%**	**15.8%**	**16.1%**	**21.7%**	**10.8%**	**4.7%**

		P/E				Cash P/E			EV/EBITDA			Dividend Yield		
	Ticker	**2021**	**2022E**	**2023E**	**10-yr Avg**	**2021**	**2022E**	**2023E**	**2021**	**2022E**	**2023E**	**2021**	**2022**	**2023**
3M	MMM	11.9 x	12.5 x	12.3 x	15.7 x	12.8 x	14.1 x	12.2 x	9.0 x	9.0 x	8.5 x	4.6%	4.7%	4.9%
Allegion	ALLE	22.0 x	21.3 x	19.0 x	17.7 x	23.3 x	23.9 x	20.1 x	18.8 x	16.7 x	14.5 x	1.3%	1.4%	1.4%
AMETEK	AME	29.3 x	25.8 x	25.2 x	17.9 x	31.5 x	28.6 x	27.1 x	22.1 x	19.2 x	17.8 x	0.6%	0.6%	0.6%
Carrier	CARR	19.5 x	18.8 x	17.3 x	N/A	20.8 x	26.7 x	17.5 x	14.4 x	13.3 x	12.6 x	1.1%	1.4%	1.4%
Core & Main	CNM	21.6 x	10.7 x	13.0 x	N/A	NM	NM	10.3 x	11.7 x	7.9 x	8.4 x	0.0%	0.0%	0.0%
Dover	DOV	18.7 x	16.9 x	16.2 x	13.4 x	22.0 x	23.7 x	16.3 x	14.4 x	13.3 x	12.0 x	1.4%	1.4%	1.4%
Eaton	ETN	28.9 x	25.8 x	23.4 x	12.0 x	NM	28.8 x	27.0 x	22.2 x	18.9 x	16.4 x	1.8%	1.9%	1.9%
Emerson	EMR	20.6 x	18.6 x	17.6 x	16.8 x	19.3 x	22.6 x	16.3 x	14.2 x	13.8 x	11.5 x	2.1%	2.1%	2.2%
Fortive	FTV	24.7 x	21.9 x	21.1 x	20.4 x	27.0 x	20.9 x	20.1 x	21.6 x	17.9 x	16.3 x	0.4%	0.4%	0.4%
General Electric	GE	NM	NM	18.7 x	2.1 x	19.0 x	19.7 x	15.4 x	14.5 x	12.2 x	8.7 x	0.4%	0.4%	0.4%
Honeywell	HON	27.2 x	24.9 x	23.8 x	15.2 x	29.8 x	31.4 x	23.3 x	18.0 x	17.2 x	16.5 x	1.7%	1.8%	1.9%
Illinois Tool Works	ITW	26.9 x	25.5 x	25.5 x	0.0 x	32.0 x	29.9 x	24.9 x	20.2 x	18.9 x	18.4 x	2.1%	2.2%	2.4%
John Bean Technologies	JBT	23.1 x	19.4 x	18.4 x	16.0 x	17.1 x	NM	25.3 x	14.0 x	16.8 x	11.8 x	0.4%	0.4%	0.4%
Johnson Controls International	JCI	24.3 x	21.6 x	18.5 x	N/A	25.1 x	24.4 x	16.6 x	15.1 x	13.4 x	11.6 x	1.6%	2.1%	2.1%
Parker Hannifin	PH	18.4 x	16.5 x	15.8 x	15.1 x	16.9 x	18.1 x	12.6 x	15.1 x	0.0 x	8.6 x	1.2%	1.4%	0.0%
Pentair	PNR	13.5 x	12.8 x	13.6 x	17.8 x	13.8 x	13.2 x	14.7 x	11.6 x	12.5 x	12.7 x	1.7%	1.8%	1.9%
Rockwell	ROK	28.4 x	26.9 x	21.7 x	N/A	27.4 x	33.3 x	20.6 x	23.9 x	20.9 x	16.9 x	1.6%	1.7%	1.8%
Vontier	VNT	6.7 x	6.0 x	6.0 x	N/A	7.6 x	10.1 x	6.8 x	7.2 x	7.0 x	7.1 x	0.4%	0.5%	0.5%
Vertiv	VRT	18.2 x	24.7 x	24.7 x	N/A	NM	NM	21.5 x	13.7 x	14.2 x	9.7 x	0.1%	0.0%	0.0%
AVERAGE		**21.8 x**	**20.0 x**	**18.6 x**	**14.5 x**	**22.1 x**	**23.3 x**	**18.9 x**	**16.0 x**	**14.0 x**	**13.3 x**	**1.3%**	**1.4%**	**1.4%**
MEDIAN		**22.0 x**	**21.3 x**	**18.5 x**	**15.7 x**	**21.6 x**	**23.9 x**	**19.8 x**	**14.5 x**	**14.0 x**	**12.0 x**	**1.3%**	**1.4%**	**1.4%**



Management Commentary

Eaton (ETN) on growth and order wins…. "And before I turn things over to Tom to go through the quarterly results, I want to highlight a few of the key themes that are really underpinning our confidence in our long-term growth outlook. As noted here, we continue to benefit from the 3 secular growth trends that we reviewed earlier: electrification, energy transition and digitalization. And while still in the early stages, we booked some $700 million of new wins in the quarter that are directly tied to these trends. Within electrification, you've all read the announcements of the very large number of manufacturing projects in the U.S. that includes new semiconductor facilities, big investments in new electric vehicle manufacturing plants, new EV battery investments and investments in EV charging infrastructure. In fact, there's been some $1.3 trillion of new projects announced this year alone. And the impact of stimulus bill is yet to show up in these numbers. These incentives will point towards large investments that are tied to improving electrical infrastructure and will deliver significant benefits over the next few years. The next large growth driver is energy transition. The move away from fossil to renewables that's taken place for a number of years now, and this trend will only accelerate. And with every renewable resource addition, it requires electrical infrastructure. But it's not just, I'd say, connecting power to the grid. It's also investments in technology to keep the grid stable to manage different sources of electrical power, investments in batteries to store excess energy. And these are all products and services that we naturally provide. Beyond renewables, we're also seeing an increase in investments relating to improving grid resiliency, which has become a priority due to extreme weather events and really the demand for a need for energy independence."

Parker Hannifin (PH) on deals making it longer-cycle…. "We deployed $25 billion of cash, about $20 billion of it towards acquisitions, which you can see those 4 acquisitions on the bottom of this page, CLARCOR, LORD, Exotic and Meggitt totally reshaping the portfolio of the company, doubling engineered materials, doubling filtration and doubling aerospace. If you combine that portfolio change through capital deployment and our secular alignment around those 8 technologies going into aerospace, digital, clean tech and electrification, the portfolio is going to behave much differently going in the future is going to grow much differently. It's going to be a longer cycle. And if you look at our forecast going out in the future will be about 85% long cycle or aftermarket, 15% short cycle. So a dramatic shift in how the company has been designed. So as you go forward, aerospace continues to be strong. We've got the commercial recovery both on the OEM side and the aftermarket continues to be strong, a little bit of softness in military OEM, but that will -- once we anniversary some big business we had there, that will get back to low single digits."

OptionsHawk Executive Summary & Focus Stocks

General Electric (GE) is a value buy at 11.5X as its portfolio transformation can be an upside driver and allow it to improve its industry-worst margins. **Parker Hannifin (PH)** looks way undervalued at 12.9X considering solid growth, nice margins and rising estimates. **AMETEK (AME)** remains a best-in-class growth and margin name but you are paying a premium at 19.3X and **IDEX (IEX)** also a quality name but at 21X tough to own at this level. **Regal Rexnord (RRX)** screens as an attractive mid-cap at just 9X EBITDA. **Standex (SXI)** and **Kadant (KAI)** are two smaller caps with strong growth, solid margins, upward revisions and cheap valuation as attractive names to own.

Machinery & Equipment – Automation & Motion Control

Components: ABB, EMR, ROK, NDSN, GGG, RBC, ITT, AIMC, GTES, HLIO, HOLI, SYM, AMOT, BGRY

International & Private Peers: Chint, Legrand, LS Electric, Panasonic, Schneider Electric, Siemens, Yokogawa, Endress+, Hauser, Kongsberg, Valmet, Garrett, Toshiba, WEG Industries, Danfoss, Nidec, Lafert

Intro

This group is focused on companies with a majority of exposure to electrification, motion and automation solutions with the majority of revenues tending to come from Industrial customers. EMR is becoming a pure play Automation name after selling 55% of its climate business to Blackstone. Key end markets like EV, life sciences, and energy transition and applications like independent cart, cyber security and emissions are growth drivers across the group.

Industry Backdrop & Investment Considerations

Energy transition, digitalization, and water resource management are the top secular trends.

Indicators, Metrics & Stock Selection Framework

The Automation & Motion group can be valued like a traditional Industrial utilizing EV/EBITDA multiple and assessing FCF Yield, ROIC, Organic Revenue Growth, EBITDA growth and EBITDA Margins. Inventory metrics can also provide insights while Debt/EBITDA is the leverage ratio to observe. Valuation across sectors increasingly reflects ESG themes and fund ownership.

Valuation & Comps

OCF/Sales vs. EV/EBITDA

	MS	Recent	Price	Div.	Mkt Cap	Ent. Val.	EV/EBITDA				P/E				Unlevered FCF/EV*				Net Debt/EBITDA			
Ticker	Rating	Price	Target	Yield	($MM)	($MM)	2021	2022E	2023E	2024E	2021	2022E	2023E	2024E	2021	2022E	2023E	2024E	2021	2022E	2023E	2024E
Industrial Equipment & Technology																						
XYL	OW	$110.79	$105.00	1.1%	19,967	21,066	24.8x	23.9x	20.5x	18.1x	44.5x	40.8x	33.4x	29.0x	1.8%	2.1%	3.6%	3.8%	1.3x	1.0x	0.4x	NM
IEX	OW	$231.47	$235.00	1.0%	17,458	17,793	23.6x	20.6x	19.2x	17.8x	36.7x	31.2x	29.1x	27.2x	3.0%	3.1%	3.8%	4.1%	0.4x	0.5x	NM	NM
NDSN	EW	$229.13	$250.00	1.0%	13,109	13,645	19.7x	17.4x	16.3x	15.0x	29.6x	24.4x	23.3x	22.0x	3.6%	3.4%	4.4%	4.9%	0.7x	0.7x	0.1x	NM
GGG	EW	$69.63	$70.00	1.2%	11,735	11,304	20.0x	18.6x	17.3x	16.2x	28.5x	26.7x	25.4x	24.4x	2.8%	1.9%	4.1%	4.4%	NM	NM	NM	NM
GTLS	OW	$122.53	$205.00	NM	4,489	5,232	25.4x	18.7x	11.7x	10.2x	50.4x	28.0x	16.5x	15.0x	NM	2.2%	4.0%	6.2%	3.4x	2.2x	1.0x	0.3x
BMI	UW	$115.78	$80.00	0.7%	3,389	3,302	31.1x	28.3x	24.9x	23.4x	55.8x	50.6x	42.8x	39.5x	2.4%	2.0%	2.8%	3.0%	NM	NM	NM	NM
ITRI	EW	$52.74	$50.00	NM	2,383	2,697	22.1x	34.3x	16.9x	11.3x	69.0x	NM	72.0x	37.9x	4.5%	1.4%	3.9%	5.9%	2.3x	2.8x	0.8x	NM
PRM	OW	$9.47	$14.00	NM	1,489	2,413	17.7x	24.4x	15.4x	13.1x	45.7x	NM	43.0x	29.3x	3.9%	2.3%	5.3%	6.1%	4.0x	4.9x	2.6x	1.9x
Median							*22.9x*	*22.2x*	*17.1x*	*15.6x*	*45.1x*	*29.6x*	*31.3x*	*28.1x*	*3.0%*	*2.1%*	*4.0%*	*4.6%*	*1.8x*	*1.6x*	*0.8x*	*1.1x*
Electrical Equipment / Multi-Industry (Covered by Josh Pokrzywinski, 1 of 2)																						
HON	EW	$214.51	$204.00	1.7%	144,220	172,553	21.0x	20.0x	17.1x	15.1x	26.6x	24.5x	22.7x	20.1x	3.4%	3.3%	4.9%	5.0%	0.8x	1.0x	0.6x	0.3x
GE	OW	$85.39	$88.00	0.6%	93,303	106,469	6.4x	7.9x	6.4x	5.4x	49.8x	NM	18.8x	14.4x	1.3%	10.1%	3.0%	4.1%	NM	NM	NM	NM
MMM	UW	$127.15	$110.00	4.7%	70,281	84,777	8.9x	9.4x	8.9x	8.2x	11.8x	12.4x	12.2x	11.5x	7.0%	5.6%	6.9%	7.9%	1.3x	1.4x	1.2x	0.9x
ITW	UW	$226.45	$172.00	2.1%	69,562	83,568	19.4x	17.9x	17.4x	16.4x	26.6x	23.9x	25.2x	24.0x	3.1%	3.4%	3.9%	4.0%	1.5x	1.5x	1.4x	1.2x
ETN	OW	$162.63	$174.00	2.0%	64,678	73,591	17.2x	15.4x	14.0x	12.7x	24.6x	21.5x	19.6x	17.8x	2.3%	3.4%	4.6%	5.3%	1.9x	1.6x	1.2x	0.8x
EMR	EW	$94.61	$92.00	2.2%	55,943	63,076	12.1x	10.8x	11.1x	10.3x	21.0x	18.0x	23.4x	21.5x	5.6%	4.5%	5.6%	6.3%	NM	0.1x	NM	NM
JCI	OW	$65.77	$67.00	2.0%	45,296	52,940	15.2x	14.3x	12.4x	11.3x	24.7x	21.9x	18.6x	16.2x	3.8%	2.8%	4.5%	5.6%	1.8x	1.9x	1.6x	1.5x
CARR	OW	$43.04	$45.00	1.5%	35,993	35,151	13.1x	11.5x	10.0x	9.2x	19.0x	18.3x	16.2x	14.7x	6.1%	4.3%	6.8%	7.6%	NM	NM	NM	NM
TT	OW	$174.48	$183.00	1.5%	40,184	43,511	19.0x	16.3x	14.5x	13.4x	28.7x	24.2x	21.3x	19.6x	3.5%	6.0%	4.8%	5.1%	1.1x	1.1x	0.9x	0.6x
FAST	UW	$51.59	$43.00	2.6%	29,549	29,803	21.7x	18.7x	18.4x	17.3x	32.2x	27.4x	26.7x	25.1x	2.1%	2.1%	1.4%	2.6%	0.1x	0.2x	0.3x	0.2x
AME	OW	$138.03	$144.00	0.6%	31,699	34,236	21.4x	18.8x	17.3x	15.8x	28.4x	24.5x	23.0x	21.6x	3.4%	3.6%	4.4%	4.7%	1.4x	1.0x	0.3x	NM
ROK	OW	$258.67	$269.00	1.7%	29,707	30,658	23.9x	21.3x	18.3x	16.1x	27.4x	27.2x	23.6x	20.7x	3.9%	2.3%	3.9%	4.6%	NM	0.3x	0.3x	0.0x
FTV	OW	$66.40	$75.00	0.4%	23,493	26,623	22.5x	18.1x	16.0x	14.1x	24.1x	21.3x	19.4x	17.7x	3.8%	4.6%	5.2%	5.8%	2.6x	1.7x	1.0x	0.3x
SWK	EW	$80.50	$82.00	3.6%	11,909	19,877	7.3x	12.9x	11.3x	8.2x	7.4x	17.9x	18.1x	10.7x	1.8%	NM	7.6%	8.0%	2.4x	4.7x	3.9x	2.6x
Median							*18.1x*	*15.9x*	*14.3x*	*13.0x*	*25.6x*	*21.9x*	*20.4x*	*18.7x*	*3.4%*	*3.6%*	*4.7%*	*5.2%*	*1.5x*	*1.3x*	*1.0x*	*0.7x*

Management Commentary

Emerson (EMR) on its transformation…. "Our more concentrated exposure to these growth trends, our management process and wide-sized fixed cost structure will drive higher levels of profitability, reflected an expected incremental margins in the 35% range. Structurally, Emerson's new portfolio will have higher margins based on increasing software content and high-margin recurring aftermarket and subscription revenues. Emerson will be less capital intensive at approximately 2% of sales and cash conversion will continue to be strong at approximately 100% of net income. The proceeds received from the Climate Tech and

InSinkErator divestitures will enhance our ability to drive internal growth programs and expand our portfolio while continuing to provide robust cash returns to our shareholders. Driving organic growth will be a priority as we invest to accelerate innovation through new processes and higher R&D spend focusing on breakthrough technologies. Our balance sheet capacity will enable us to pursue strategic acquisitions in defined automation verticals to accelerate growth and enhance end market diversity. First, and importantly, is the value of the new Emerson, a company that benchmarks favorably against our automation peers in terms of growth outlook, profit margins, free cash flow conversion, and software content. Life Sciences continues to be a growth opportunity for Emerson as ongoing investment support drug vaccine and medicine development. We expect 2023 to be another strong year for our discrete business coming off accelerated growth in the previous 2 years. We continue to be optimistic about the long-term prospects for discrete, especially within semiconductor, electronics and EV manufacturing markets."

Rockwell (ROK) on serving new verticals…. "I mentioned before about increasing the number of competitively served verticals. We've always talked about the automobile industry, and we have strengthened our ability to cover automotive, particularly as EV gives us new opportunities. And I've talked to you before about Rockwell being a net beneficiary of electric vehicles, because even though the overall component count in an EV vehicle is less than that of an ICE vehicle, a combustion -- internal combustion engine vehicle, Rockwell was never deeply penetrated on the powertrain side. And we do great work on the battery side and the new elements of drivetrain that are part of an EV. In addition to automotive, we've added penetration into the semiconductor industry. And with the amount of CapEx going on there, that's really important. We've always been a player in control systems, the building, the clean room, environment, primarily in Asia, where so much of that work was going on, but we'll globalize that. Cybersecurity, as they're all concerned about that and our ability to get in to do assessments and remediation in their cyber environment and so on. Warehouse automation and even though e-commerce has slowed a little bit in terms of the new fulfillment centers, companies like Walmart are still intensely interested in taking efficiency gains between the make part of their supplier network and getting it into the warehouses and into the back of the store. In hybrid, food and beverage, of course, is our single biggest vertical and we are finding new ways to add value there. We've talked all about life sciences. We'll talk about it some more, because it's really important. People want to live longer, healthier lives. So we think we're on the right side there. Eco-industrial with renewables."

OptionsHawk Executive Summary & Focus Stocks

Rockwell (ROK) and **Nordson (NDSN)** are two quality large caps in this group trading 17-20X and showing durability to growth along with strong FCF. **RBC Bearings (RBC)** is the strongest name overall as a small cap at 18.7X with impressive growth, FCF and rising estimates. **ITT (ITT)** goes into the value buy group trading 11.75X while having better metrics than many higher valued peers.

Machinery & Equipment – Water Filtration & Flow

Components: XYL, DCI, WMS, PNR, CNM, WTS, ZWS, FLS, FELE, BMI, NPO, ESE, HAYW, MWA, GRC, CIR, CECE, NWPX

	PNR	AQUA	AOS	MUELLER	BMI	WTS	XYL	FELE	RXN
Key Products	Water Treatment, Filtration, Aquatics/Pool, Point-of-Use	Water & Wastewater Treatment Solutions	Hot Water Heaters & Boilers, Water Treatment	Hydrants, Iron Gate & Butterfly Valves, Brass Products, Pipe Repair & Leak Detection, Metering	Water Metering	Commercial & Residential Water Products	Water Transportation, Treatment, Testing and Metering	Water Pumping Systems	Behind-the-Wall Plumbing

International & Private Peers: KSB, Sulzer, Grundfos, Wilo SE

Intro

Water stocks have seen some investor concern regarding continued margin expansion given the expectation for the easing of supply chain and better price/cost dynamics in 2023. There have been encouraging pricing trends for metals and ocean freight while also a high degree of uncertainty on cost pressures elsewhere including on labor, logistics, and component constraints.

XYL reported 3Q22 beat across all key metrics given solid demand and price realization while chip supply continued to improve. XYL highlighted the healthy YTD order growth and the strength in bidding pipeline. To this point, management noted that the majority of its utilities sales (~50% of revenues) is driven by OpEx spending -- which have remained solid, while CapEx driven sales have not yet seen a slowdown. The industrial end market (~35% of revenues) saw good orders momentum and resiliency on equipment sales, according to the company. Residential and commercial (~15% of revenues) are also largely replacement driven. XYL also expects continued margin expansion given the expectation for the easing of supply chain and better price/cost dynamics in 2023. PNR expects to see continued growth in revenue, income, earnings and cash flow driven by its diversified portfolio and improvements in supply chain and operational efficiency. PNR noted that supply constraints for its variable speed pumps have begun to ease and the company is catching up on shipments. PNR estimated that new pool construction may decline double-digits in 2023, break/fix is expected to continue to grow driven by a large base of aging in-ground pools which will require ongoing maintenance. WTS continues to see steady order rates, with Americas holding up and APMEA/Europe staying relatively more muted given rolling lockdowns in China/growing recession concerns in EU.

Industry Backdrop & Investment Considerations

This group benefits from accelerating municipal and private construction end market demand as investment in water infrastructure and a focus on water conservation increase and the need for new and upgraded water systems grows with increased residential and non-residential construction activity. The global water market is immense, capital-intense and underinvested.

Spending on Water & Wastewater CAPEX in U.S. is >$50B and ASCE estimates that the current annual investment gap expected to increase from $81B to $136B in 2039.

Less than 1% of the total water available on earth is fresh water, and these supplies are under threat due to factors such as the draining of aquifers, increased pollution and the effects of climate change. Demand for fresh water is rising rapidly due to population growth, industrial expansion, and increased agricultural development, with consumption estimated to double every 20 years. By 2025, more than 30% of the world's population is expected to live in areas without adequate water supply.

Restoring existing water systems and expanding them to serve a growing population through 2050 will require a $1.7 trillion investment. ASCE grade for drinking water infrastructure is C- and grade for wastewater infrastructure is D+. The average age of water pipes has increased to 45 years in 2020 from 25 years in 1970.

Long term secular growth trends include Safety/Regulation, Energy Efficiency and Water Conservation.

Indicators, Metrics & Stock Selection Framework

The Water Filtration & Flow group can be valued like a traditional Industrial utilizing EV/EBITDA multiple and assessing FCF Yield, ROIC, Organic Revenue Growth, EBITDA growth and EBITDA Margins. Inventory metrics can also provide insights while Debt/EBITDA is the leverage ratio to observe.

Valuation & Comps

FCF/EBITDA to EV/EBITDA

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Water & Flow					#VALUE!		#VALUE!		#VALUE!	#VALUE!
XYL	Xylem Inc	20.7B	24.58X	10.58%	3.86%	18.26%	2.26%	5.87%	4.35%	1.69%
PNR	Pentair PLC	7.7B	12.21X	6.43%	1.77%	20.88%	4.89%	14.48%	-2.61%	1.74%
WMS	Advanced Drainage Systems	8.3B	10.02X	(2.112%)	-2.90%	29.77%	#VALUE!	11.0%	66.76%	16.60%
DCI	Donaldson Company Inc	7.3B	12.77X	4.04%	2.22%	17.83%	5.46%	15.18%	9.26%	5.93%
WTS	Watts Water Technologies In	5.1B	14.07X	3.95%	-0.17%	18.94%	2.91%	14.34%	17.67%	3.91%
CNM	Core & Main Inc	5.1B	8.52X	(11.374%)	-5.87%	15.13%	#VALUE!	8.1%	54.48%	17.59%
ZWS	Zurn Elkay Water Solutions C	4.4B	17.99X	12.84%	17.72%	21.67%	1.96%	(2.611%)	-9.55%	26.00%
FLS	Flowserve Corp	4.0B	17.04X	12.0%	8.69%	5.0%	-0.87%	3.15%	-48.30%	-5.83%
FELE	Franklin Electric Co Inc	3.8B	13.02X	7.64%	-0.34%	17.0%	2.52%	12.77%	12.87%	2.72%
BMI	Badger Meter Inc	3.4B	28.86X	5.97%	5.61%	20.66%	1.82%	12.79%	16.41%	13.53%
ESE	ESCO Technologies Inc	2.3B	13.39X	7.72%	6.31%	21.38%	#VALUE!	6.63%	1.61%	1.96%
NPO	EnPro Industries Inc	2.3B	11.92X	2.96%	1.44%	25.46%	5.26%	5.71%	30.18%	-2.82%
HAYW	Hayward Holdings Inc	2.0B	8.14X	9.28%	-10.84%	24.64%	8.85%	13.28%	-21.56%	-15.24%
MWA	Mueller Water Products Inc	1.8B	9.76X	8.18%	3.80%	11.65%	6.00%	5.79%	-0.62%	10.65%
GRC	Gorman-Rupp Co	0.7B			18.61%	17.1%	#VALUE!	8.1%	-24.03%	36.04%
CIR	CIRCOR International, Inc.	0.5B	10.24X	3.68%	0.87%	17.06%	-6.54%	3.27%	-15.68%	0.70%
NWPX	Northwest Pipe Co	0.3B	6.78X	(12.073%)	1.98%	15.28%	#VALUE!	5.35%	35.29%	10.49%

Management Commentary

Xylem (XYL) on demand trends…. “Demand at all of our largest end markets continued to be strong driven by the essential nature of our solutions and services and by intensifying long-term trends in Water. The team, from our factories to our channel partners and distributors, also delivered a tremendous operational performance. Their actions entirely offset inflation with very strong price cost discipline and effectively manage through continuing chip supply constraints. That focus paid off in growth, but also with very strong EBITDA margin expansion. As you all know, our key end markets have consistently been resilient in the face of macroeconomic headwinds, and we expect that underlying demand pattern to continue. M&CS orders continue to be very strong. Water Infrastructure was up solidly. Backlogs continue to be up sharply year-over-year, and the digital solutions proportion of our backlogs continue to expand. That said, some of our smaller end markets are more cyclical, such as residential within our Applied Water segment. Orders in those markets were down in the quarter and are expected to remain soft. Infrastructure investment is the much bigger driver of underlying demand. Xylem Solutions like advanced metering infrastructure, wastewater network optimization and municipal water recycling, amongst so many others, provide much more than compelling economics. They deliver game-changing resilience. The mini water crisis making headlines in recent months make it clear that the effects of climate change are already driving rapid increases in cost at the community level. To attack the problem at its source, more and more cities are making net zero emissions commitments. Our opportunity is to help water utilities reduce their own carbon footprint.”

Advanced Drainage (WMS) on Residential…. “Sales growth of 25% was broad-based across geographies in both the construction and agriculture end markets, supported by continued strength in our priority states and Allied Products. The strongest volume growth occurred in the ADS residential and agricultural end markets. In the ADS agriculture business, we did a good job level loading deliveries, and that is shaping up for a fall season with year-over-year growth. The ADS residential business grew as homebuilders continue to develop land despite market uncertainty. We expect homebuilder land development to continue on previously acquired land and over the long term, the lack of available home supply will continue to drive growth in this market. ADS participation in the residential market is still early in the material conversion story. So despite the pullback, residential remains a large growth opportunity for the company. This is important to note since

Florida is the largest state in terms of sales for the company. We expect contractors in Southwest Florida to prioritize recovery efforts in the near term as opposed to the stormwater project installations as we move through the fiscal Q3."

OptionsHawk Executive Summary & Focus Stocks

This is always a favored Industrial group as it is much more durable during weaker Macro cycles and there are several quality small caps. **Xylem (XYL)** is the only large cap but at 25X EBITDA with weaker margins than peers a tough name to own with better options. The next group also looks to be facing a sharp slowdown in growth and previous favorites like **Advanced Drainage (WMS)** and **Watts (WTS)** just are not screening positive for 2023. **Pentair (PNR)** at 12.2X looks to be the best value of the group this year with numbers holding up better. The smaller names screen healthier highlighted by **Badger (BMI)** and **ESCO (ESE)** while **Zurn (ZWS)** the strongest growth name is richer at 18X.

Machinery & Equipment – Transportation Equipment

Resources: ISL, Baltic Freight Index

Components: WAB, TRTN, GATX, CTOS, TGH, GBX

International & Private Peers: SeaCube, Seaco, Florens, Union Tank Car Co., SMBC Rail Services, Wells Fargo Rail, Progress Rail Services

Intro

Underlying freight demand trends remain supportive of future volume growth (improving NA carloads, declining locomotive parking's, underinvestment over the past several years). This is a smaller group with WAB the compelling play while containers are facing potential for a combination of weakening demand and pricing following the post-pandemic surge. TRTN noted that new box prices have fallen to $2,200, or in line with historical averages, from $3,800 a year ago. CEO Brian Sondey noted that the market environment slowed in 3Q following two years of exceptional demand, peak season volumes were muted this summer, and many customers increased the pace of container drop-offs. He also noted that new container orders decreased across the market, new box prices and market leasing rates have returned to historically normal levels, and used container sale prices normalized quickly, yet remain elevated. GBX is seeing volumes recover for railcare deliveries but manufacturing margins remain under pressure.

Strong levels of backlog coverage and ongoing decarbonization growth drivers continue to imply a supportive growth backlog for WAB with resilient NA & Int'l freight trends complementing supportive order activity/customer conversations for both new locos and modernizations. Long-term decarbonization goals support both ongoing modernization activity and some potential for new loco orders ahead of increased ZEV loco commercialization towards the later part of the decade.

Industry Backdrop & Investment Considerations

These companies provide equipment, systems and services for the global freight rail and passenger transit industries. Operating results are largely dependent on the level of activity, financial condition and capital spending plans of freight railroads and passenger transit agencies around the world, and transportation equipment manufacturers who serve those markets. Many factors influence these industries, including general economic conditions; traffic volumes, as measured by freight carloadings and passenger ridership; government spending on public transportation; and investment in new technologies. In general, trends such as increasing urbanization and growth in developing markets, a focus on sustainability and environmental awareness, increasing investment in technology solutions, an aging equipment fleet, and growth in global trade are expected to drive continued investment in freight rail and passenger transit.

According to the 2020 bi-annual edition of a market study by UNIFE, the Association of the European Rail Industry, the accessible global market for railway products and services is more than $120 billion and is expected to grow at a compounded annual growth rate of 2.3% through 2025. UNIFE estimated the global installed base of freight cars was about 5.2 million, with about 35% in North America, about 24% in Russia-CIS, and about 24% in Asia Pacific. UNIFE estimated the global installed base of passenger transit vehicles to be about 620,000 units, with about 45% in Asia Pacific, about 31% in Europe and about 10% in Russia-CIS.

The most important driver of profitability is the extent to which leasing revenues, which are driven by owned equipment fleet size, utilization and average rental rates, exceed ownership and operating costs.

UNIFE expects increased investment in digitalization, automation, and predictive maintenance through artificial intelligence, all of which would improve efficiency in the global rail industry. UNIFE expects these trends to increase the overall attractiveness of the rail sector as these trends are expected to lead to significant cost savings, allowing rail to be more competitive in comparison to other modes of transportation.

The shipping business has been characterized by cyclical swings due in part to lengthy periods of excess or scarce vessel capacity. These sustained periods of vessel supply/demand imbalances are mainly a function of the multi-year ordering and production cycle associated with the manufacture of new vessels, which requires shipping lines to estimate market growth many years into the future, and the shipping line industry's shift to the use of significantly larger vessels. Container leasing companies are partially insulated from the risks of these shipping cycles by the relatively short production time associated with the manufacture of new containers. Lead times for new container orders are typically only a few months, so the rate of new container ordering can be quickly adjusted to reflect unexpected market changes.

Indicators, Metrics & Stock Selection Framework

The RWI/ISL container throughput index reflects the amount of container cargo handled by a selection of 91 international ports, representing 60% of global container traffic. The inventories-to-sales ratio from the US Census Bureau serves as an indications of the number of months of inventory that are on hand in relation to the sales for a month. The Freight Baltic Container Index (FBX) reflects the container spot rates on 12 trade lanes, covering 80% of global container trade.

The Transports Equipment group can be valued like a traditional Industrial utilizing EV/EBITDA multiple and assessing FCF Yield, ROIC, Organic Revenue Growth, EBITDA growth and EBITDA Margins. Inventory metrics can also provide insights while Debt/EBITDA is the leverage ratio to observe.

The Intermodal Leasing names also have their own key metrics like Utilization (CEU), Container Pick-Up to Drop-Off Ratios, and Dry Depot Lease Inventory. In Railcar we look at metrics like Backlog and Deliveries.

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Transports					#VALUE!		#VALUE!		#VALUE!	#VALUE!
WAB	Westinghouse Air Brake Tech	18.7B	14.04X	5.06%	5.33%	22.2%	4.23%	5.16%	-0.10%	-2.60%
TRTN	Triton International Ltd	4.1B	7.74X	1.44%	-1.48%	89.82%	#VALUE!	4.93%	5.77%	-1.78%
GATX	GATX Corporation	3.9B	11.07X	(0.344%)	5.48%	59.31%	#VALUE!	0.95%	3.75%	-2.54%
CTOS	Custom Truck One Source Inc	1.6B	7.66X	5.39%	8.80%	25.61%	-0.62%	(12.784%)	3.57%	-5.65%
TGH	Textainer Group Holdings Lin	1.4B		4.22%	-0.56%		#VALUE!		14.17%	-1.83%
GBX	Greenbrier Companies Inc	1.2B	7.04X	0.02%	-5.83%	9.34%	-39.49%	0.64%	18.79%	30.50%

Management Commentary

Westinghouse Air Brake (WAB) on key metrics and opportunities head…. "As we look at key metrics across our trade businesses, we are encouraged by underlying business momentum and strong pipeline of opportunities. North America carloads were up slightly in the quarter after being down for the 4 previous quarters, and locomotive parkings are down from the same time last year despite lower year-to-date freight traffic. We continue to see significant opportunities in demand for new locomotives and modernizations as our customers invest in their aging fleets and place a greater focus on reliability, productivity and fuel efficiency. When it comes to the North America railcar built, demand for railcars is increasing from what we believe were trough levels in 2021. Railcars and storage are below pre-COVID levels with about 17% of the North American railcar fleet in storage. As a result, industry orders for new railcars continue to improve, and the industry outlook for 2022 is for about 40,000 cars to be delivered. Overall, we believe we have an opportunity to continue building significant long-term momentum with growth in modernizations in new locomotive sales in railcar builds and enrolling stock. Internationally, trade activity also continues to show positive signs. We have been growing our international fleet in the mid-single digits on average over the last 5 years, and we continue to execute on a strong pipeline of broader opportunities. This strength is reflected in this quarter's equipment sales growth of 32%. Finally, transitioning to the Transit sector. The long-term secular drivers are positive as the industry continues to trend towards clean, safe and efficient transportation solutions. In Freight, the demand continues to accelerate the need to grow and refresh our expansive global installed base accelerates the adoption of next-gen technologies and expand our international footprint. In Transit, the investment in green infrastructure continues with structurally high energy prices and climate change, making the need more urgent."

GATX (GATX) on railcar industry dynamics…. "Well, as we've said before, with regards to the recovery we've seen here over the course of the last few years -- or last year, 18 months, it's been more of a supply side-driven improvement. And again, this kind of gets to the point that Tom referenced with regards to the bifurcation between the existing car market and the new car market. So there definitely is an inflation impact there. We're still optimistic based on the dynamics right now, which really points to customers holding on to their existing cars. That's obviously come through not only in our utilization, but our very high renewal success rate and the lease rate improvement that we've seen. They're compelled to hold on to those assets. We don't see that changing anytime soon, especially given the replacement cost of going out and buying new assets in this environment. So we think we're in a very good position to continue to capitalize on that. So compared to long-term averages, most tank car types are up between about 10% and 20% versus those long-term averages. Most freight car types are hovering right around the long-term average, maybe a little above or a little below. For both tank and freight cars, the energy-related car types are still well below long-term averages."

Triton (TRTN) on container markets…. "Our market environment slowed during the third quarter, following nearly 2 years of exceptional container demand. Peak season shipping volumes were muted this summer, and many of our customers have increased the pace of container drop-offs. New container orders have decreased across the market, and new container prices and market leasing rates have returned to historically normal levels. Used container sale prices have started to normalize more quickly, though they're still very high. The large number of containers we purchased over the last few years are locked away on long-duration, high-IRR leases. We have increased the share of our containers on lifecycle leases and increased the average remaining duration of our lease portfolio, and we have locked in low-cost financing with long-term fixed-rate debt. Pickup volumes decelerated in the first half of this year, though drop-offs remained low. Recently, we've seen drop-offs accelerate as our customers reacted to a muted peak season and some easing of logistical bottlenecks. The lower-right bubble chart details the pace of our new container transaction activity. New container activity has greatly reduced from last year, reflecting the changes in market conditions and our customers' shift in focus to operational efficiency. The chart also shows that new container leasing rates have dropped back into the historically normal range.”

OptionsHawk Executive Summary & Focus Stocks

Wabtec (WAB) remains a top large cap Industrial long at 14X EBITDA with solid growth and like the multi-year opportunities ahead. **Custom Truck One (CTOS)** is a small cap that screens favorably yet again at 7.6X EBITDA with steady growth.

Machinery & Equipment – Industrial Technology

Components: HON, ROP, PTC, ZBRA, VNT, MIR, ANSS, AZPN, KEYS, MSI, TRMB

International & Private Peers: Dassault Systemes, Siemens, Aveva, Hexagon

Intro

Although much of the industrial sector is looking to become more software-focused these are the names that have already positioned themselves as industrial technology leaders, including large cap Honeywell which continues to move more to a software model. Motorola Solutions (MSI) and Trimble (TRMB) could also be included in this group but are in Tech groups later.

Industrial Tech names are consistently trading at premiums to the rest of the sector due to the higher margin profiles while FX has been a major headwind. ZBRA, a former leader in this group has seen shares fall 60% this year with ongoing supply chain challenges, FX headwinds and signs of softening demand with project deferrals. Digital transformation and omnichannel investments remain a relatively higher priority for customers, but outsized growth in recent years likely leads to digestion period. ROP has been active in M&A deals in software for many years and continues to see opportunities while posting strong results. ROP’s strong track record allows it to trade at a substantial premium to peers.

Industry Backdrop & Investment Considerations

Industrial Software is often tied to the global Product Lifecycle Management (PLM) market with key structural trends such as cloud migration, Industry 4.0 and dynamics across verticals with segments such as Collaborative Product Data Management, Computer Aided Design (CAD), Electronic Design Automation and Architecture Engineering Construction.

Sizing the PLM market is difficult as many industry players define the scope and capabilities differently. According to CIMdata, the overall PLM market is estimated at $57B in 2021 and expected to grow to $87bn by 2026, a 9% CAGR, and is seeing very resilient share with limited inroads from cloud-native competition.

Indicators, Metrics & Stock Selection Framework

The Industrial Tech group can be valued like a traditional Industrial utilizing EV/EBITDA multiple and assessing FCF Yield, ROIC, Organic Revenue Growth, EBITDA growth and EBITDA Margins. Inventory metrics can also provide insights while Debt/EBITDA is the leverage ratio to observe. Given the moves to a more Software-centric model we start to pay closer attention to revenue growth, billings growth and shift to EV/Sales for those segments.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Industrial Tech					#VALUE!		#VALUE!		#VALUE!	#VALUE!
HON	Honeywell International Inc	144.5B	17.79X	8.33%	3.73%	22.52%	3.36%	13.23%	1.71%	-1.64%
ROP	Roper Technologies Inc	47.1B	23.77X	11.84%	10.56%	41.1%	2.79%	5.59%	-8.60%	-12.89%
MSI	Motorola Solutions Inc	44.7B	18.89X	9.11%	6.79%	30.38%	#VALUE!	30.65%	3.45%	2.05%
KEYS	Keysight Technologies Inc	33.1B	18.33X	6.38%	4.97%	33.19%	3.90%		15.94%	8.32%
ANSS	ANSYS, Inc.	22.2B	24.73X	5.47%	7.94%	50.71%	2.51%	15.18%	-2.54%	-2.90%
PTC	PTC Inc	14.9B	20.08X	12.79%	10.76%	41.55%	3.72%	16.59%	4.64%	1.31%
AZPN	Aspen Technology Inc	14.0B	26.13X	21.69%	11.22%	85.77%	#VALUE!	5.07%	29.12%	57.38%
ZBRA	Zebra Technologies Corp.	13.6B	12.66X	13.16%	-0.39%	21.12%	3.14%	28.99%	-12.41%	-3.13%
TRMB	Trimble Inc	13.6B	16.35X	8.63%	4.59%	25.78%	2.66%	13.79%	-0.56%	-7.82%
VNT	Vontier Corp	3.1B	7.38X	4.03%	-4.76%	25.71%	11.74%	22.81%	-2.44%	-2.20%
MIR	Mirion Technologies Inc	1.2B	12.54X	10.96%	5.33%	19.14%	#VALUE!	(16.208%)	-17.39%	-2.08%

Management Commentary

Zebra Tech (ZBRA) on use cases, share gains and market expansion…"So e-commerce and retail, we think of enabling the retail associate, right? So mobile devices in the hands of a retail associate and then our new expansion area around software, software on those devices, directing tasks, allowing workers to communicate, allow them to do the most meaningful value-added task in their day through analytics. Another e-commerce is picking of orders inside a fulfillment center or the play into transportation and logistics, delivering those packages to our customers with our mobile devices. If we think of the fulfillment center from a print perspective, printing the labels on each of those packages are shipped from e-commerce. And as we think of automation in those environments, we think of expansion beyond software in areas like machine vision and fixed industrial scanning and then our robotics portfolio for warehouse automation all play a role kind of in e-commerce and retail that only doesn't -- you think initially a retail is front of store or e-commerce fulfillment, it extends all the way to kind of last mile delivery and all the way back into distribution centers that look like warehouses and manufacturing and T&L. We've been able to gain share consistently pretty much every year for the last 15 years since I joined Zebra, and we thought we could continue to do that a bit. And then we've entered into 3 new expansion markets, which are all higher growth and where we are -- have a small position, and we've -- so they're small today, but we expect them to grow faster. And as they become larger, they would have a more meaningful impact. And we did 2 acquisitions in this space: 1 Adaptive Vision in the software space. And then Matrox Imaging, really the high end of machine vision in that area."

Roper (ROP) on M&A, organic growth and its model…. "And finally, we've been active in the M&A market. Over the last few months, we deployed just over $4 billion, $3.7 billion for Frontline and $300 million for 2 Bolt-ons, one for Deltek and the other for Aderant. To this end, even after our recent $4 billion of capital deployment, we still have a large amount of available M&A firepower, over $4 billion. Next is our higher level of organic growth. This is no accident. We have raised the performance expectations for each of our businesses to structurally improve their long-term organic growth capabilities. We're doing this in a balance sheet- and margin-friendly way. A large component of the organic growth story is the higher level of recurring revenue within each of our companies, approaching 60% for the enterprise and about 75% for our software businesses. In addition, our businesses are blessed with business models that generate high levels of free cash flow, a result of their operational efficiency, margin levels and customer prepaid orientation of their balance sheets. Today, our portfolio is 75% software and 25% medical and water products. We are meaningfully less cyclical today versus 2018 given the markets we serve, health care, legal, education, government contracting, utilities and food, to name some of our larger ones, and our fixed subscription versus volume-based revenue model."

OptionsHawk Executive Summary & Focus Stocks

Motorola Solutions (MSI) and **KeySight (KEYS)** remain top picks as durable growth continues at reasonable valuation with multiple tailwinds still in play. **Roper (ROP)** continues to execute well with its moves into Software as the best growth name but comes at a 24X multiple. **Trimble (TRMB)** screens favorably at 16X and just did an interesting acquisition. **PTC (PTC)** offers similar growth and margins as Roper but at just 20X so it is a top pick in 2023 while **Aspen (AZPN)** has been an outstanding growth story with superb margins but valuation is quite extended at 27X.

Building & Construction – Construction Products

Resources: LIRA

Components: HUBB, CSL, JHX, OC, MHK, ATKR, BECN, MLI, BDC, WIRE, CSWI, ROCK, TGLS, APOG, NX, TILE, CSTE, VIEW

International & Private Peers

Intro

The focus in 2023 for this group will certainly be the impact of a slowing residential construction backdrop while commercial has been resilient. On the bright side supply chain and cost pressures are likely to ease further. Renovation is also seeing signs of slowing and there is inventory destocking occurring across multiple categories. R&R should prove relatively resilient in 2023 as the macro slows driven by a 20% rise in home equity in the last year alone, along with 79% of mortgage holders locked into rates sub-4%. Conversely, estimates call for a 17% decline in single-family starts in 2023.

Flooring is a highly discretionary purchase that can be delayed, which is causing a sharper decline in demand near-term relative to other building product categories. In roofing, OC is seeing slower volumes but generating margin expansion on strong pricing. Roofing volumes could surprise to the upside 2023 due to the impact of Hurricane Ian and improving channel inventory. The insulation market is still tight and housing completions will remain elevated into 2023. HUBB has been a strong story for the electrification theme with exposure to Utility CapEx.

Industry Backdrop & Investment Considerations

The value of content in an average US new single-family home has grown at a compounded annual growth rate (CAGR) of 3.6% from $23,073 in 1982 to $82,642 in 2018. Rising raw material prices have accounted for 2.4% of the CAGR, while increases in square footage represent the remaining 1.2%. New, residential construction is roughly a $56B market opportunity for products companies, excluding labor. The US residential repair and remodel market opportunity is estimated at $107B for building products companies, excluding labor. This puts the total residential opportunity at ~ $163B while another $23B in commercial.

The U.S. private residential construction market exceeded $690 billion in spending during the twelve months ended December 31, 2020 according to the United States Census Bureau. Residential housing starts in the US increased by 5.8% during 2020, according to the US Census Bureau. Manufacturers, distributors and installers of glass curtain walls, windows and doors for commercial and residential buildings focus on glass and aluminum transformation, window ensemble and installation and designing in the commercial and residential construction markets.

US building products operating costs consist of approximately 73% variable and 27% fixed cost components. The cost of goods sold line for most building products companies is approximately 78% variable on average, driven by substantial material purchases. However, energy, labor and overhead costs associated with manufacturing activities provide a fixed cost component in cost of goods sold. Building products companies have opportunity to leverage COGS to drive margin expansion as volumes improve. There appears to be additional opportunity for operating margin expansion through SG&A expense leverage.

Decorative Architectural (Paint), Roofing and Plumbing are the three best returning sub-sectors. Most of these building product sub-sectors are very fragmented and see a lot of consolidation. The US residential repair and remodel industry tends to be less cyclical than the new construction industry. US residential repair and remodel industry is influenced by numerous macro related factors. First, consumer confidence is critical for residential repair and remodel activity, similar to its effect on most large-ticket purchases. Consumer confidence tends to reflect the state of the general economy, employment trends, wages, and etcetera and therefore appears to be a reasonably good proxy for the consumer's willingness to spend. The US housing stock is now at its oldest point in history, which should also support residential repair and remodel activity. A third key driver of residential repair and remodel activity is existing home sales turnover and existing home sale values. These factors are also relatively intuitive in that most repair and remodel activity occurs when title of a home changes hands and the new owner makes alterations and updates to reflect his/her personal style and preferences. Therefore, higher existing home sales volume should result in greater residential repair and remodel activity. Existing home values are also correlated with the level of residential repair and remodel activity given that homeowners sometimes borrow against the equity in their homes to finance larger improvement projects. In addition, rising existing home values tend to support remodeling activity as it reinforces the view that investing in a home is a sound financial decision.

Component group	$CPH	% total content	Total addressable market ($bn)	Resi new construction market ($bn)	Resi repair/remodel market ($bn)	Top 3 players market share %
Framing Lumber/Engineered Wood	$16,190	19.6%	$25.2	$7.3	$11.1	35%
Concrete (foundation)	$9,955	12.0%	$8.8	$8.8	na	na
Windows & Doors	$8,724	10.6%	$12.4	$6.3	$5.4	47%
Siding	$7,292	8.8%	$9.5	$3.8	$5.7	38%
Plumbing	$6,357	7.7%	$7.9	$2.0	$5.9	68%
Cabinets	$5,795	7.0%	$10.2	$3.4	$6.8	48%
HVAC	$5,324	6.4%	$13.2	$2.6	$10.6	64%
Roofing	$4,600	5.6%	$9.4	$1.6	$7.8	77%
Flooring	$4,048	4.9%	$25.5	$4.1	$14.8	48%
Structural panels	$3,583	4.3%	$14.0	$7.6	$3.4	62%
Wallboard/Drywall	$3,367	4.1%	$4.1	$1.5	$1.3	63%
Appliances	$2,119	2.6%	$29.3	$4.4	$24.9	69%
Architectural coatings	$2,023	2.4%	$13.0	$1.6	$8.7	81%
Fiberglass insulation	$1,157	1.4%	$3.1	$1.4	$0.5	78%
Other	*$2,107*	*2.5%*	*na*	*na*	*na*	*na*
Total	**$82,642**	**100.0%**	**$186**	**$56**	**$107**	**60%**

Indicators, Metrics & Stock Selection Framework

Harvard's Joint Center for Housing Studies (JCHS) publishes the Leading Indicator of remodeling activity index (LIRA) which is a great resource. The JCHS analysis measures the value of repair and remodel activity as reported by homeowners and therefore includes both the cost of labor and materials. Private Fixed Residential Investment (PFRI) is another measure of repair and remodel activity that is used to gauge potential industry growth.

Architecture Billings Index ("ABI") and Dodge Momentum Index ("DMI") are leading indicators for nonresidential building construction activity.

Valuation & Comps

EV/EBITDA to EBITDA Margins

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Construction Products					#VALUE!		#VALUE!		#VALUE!	#VALUE!
HUBB	Hubbell Incorporated	13.7B	17.40X	7.48%	4.29%	18.37%	3.82%	6.61%	15.56%	8.27%
CSL	Carlisle Companies, Inc.	13.1B	9.81X	5.52%	5.06%	24.4%	5.50%	8.5%	38.89%	8.94%
JHX	James Hardie Industries plc (ADR)	9.0B	8.63X	(5.121%)	-2.13%	26.17%	#VALUE!	23.28%	6.00%	7.42%
OC	Owens Corning	9.0B	7.22X	2.21%	-3.73%	24.04%	12.24%	13.45%	19.48%	5.76%
MHK	Mohawk Industries, Inc.	6.6B	5.23X	8.63%	-4.97%	13.75%	8.79%	9.79%	-14.65%	0.75%
ATKR	Atkore Inc	5.0B	5.87X	1.06%	3.47%	31.59%	#VALUE!	71.37%	7.54%	19.59%
MLI	Mueller Industries, Inc.	3.8B			-18.17%	23.62%	#VALUE!	39.88%	76.00%	0.00%
BECN	Beacon Roofing Supply Inc	3.8B	6.75X	(1.777%)	-0.59%	11.77%	10.83%	22.93%	31.01%	16.32%
BDC	Belden Inc	3.3B	8.72X	7.32%	-0.36%	17.61%	5.66%	11.46%	33.57%	8.04%
WIRE	Encore Wire Corp	2.6B	2.23X	(9.77%)	-15.64%	33.3%	#VALUE!	69.44%	53.33%	19.79%
CSWI	CSW Industrials Inc	1.8B	12.80X	7.56%	7.19%	23.03%	#VALUE!	8.84%	35.94%	23.68%
ROCK	Gibraltar Industries Inc	1.5B	8.85X	12.68%	1.95%	14.62%	5.87%	11.27%	1.98%	-0.84%
TGLS	Tecnoglass Inc	1.5B	6.17X	6.06%	10.87%	38.91%	3.67%	20.95%	100.00%	44.14%
APOG	Apogee Enterprises Inc	1.0B		1.91%	1.53%	11.42%	#VALUE!	7.55%	68.83%	9.71%
NX	Quanex Building Products Corporation	0.8B	5.45X	9.28%	0.76%	13.64%	9.83%	11.19%	30.41%	6.31%
TILE	Interface, Inc.	0.6B	6.11X	4.5%	2.54%	12.35%	#VALUE!	8.78%	-5.56%	0.57%
VIEW	View Inc	0.3B	-1.11X	(57.635%)	94.86%	(222.805%)	#VALUE!	(133.301%)	3.00%	51.81%
CSTE	Caesarstone Ltd	0.2B	3.19X		-0.42%	7.41%	13.28%	4.26%	-55.56%	10.47%

Management Commentary

Carlisle (CSL) on performance drivers…. "First, U.S. non-residential construction demand remains strong, and we are optimistic that the underlying trends will overcome well-known pressures seen in the global economy. Re-roofing demand also continues to be a reliable, significant and sustainable driver for growth and new construction still a tailwind. Notably, we are on track for double-digit volume growth at CCM for the second straight year. Fortunately, material availability has improved meaningfully in the past few months, and as such, we are seeing a normalization of buying patterns by our customers. Additionally, the need for energy-efficient building solutions to help mitigate rising energy costs and collectively help reduce the planet's carbon footprint will continue to be a driver. Second, pricing at all of our businesses continues to be positive as we focus on earning price for the value we create for our customers through the Carlisle Experience. Our continued and growing investment in new product innovation, world-class manufacturing capabilities and best-in-class customer service, encompass the value proposition that our partners have come to rely on from Carlisle. And architects and building owners know they'll benefit from our innovative energy-efficient building solutions that the market increasingly demands. Third, residential markets are facing increased pressure due to interest rate hikes, significant inflation and at the consumer level, a reduction in building products expenditures. While impactful in the short term, we believe that longer term, fundamentals in residential markets remain attractive given the undersupply of homes in the U.S. and growing demand for energy-efficient building solutions, particularly given recent supporting legislation and rising energy costs."

Hubbell (HUBB) on growth trends…. "We are well positioned in attractive markets that are supported by long-term trends in grid modernization and electrification, which continue to drive strong demand for our products. Utility customers are proactively replacing aging infrastructure while investing significantly to upgrade, harden and modernize the grid, driving another quarter of strong orders growth and backlog build. The work that we have done to streamline our portfolio and the investments we are making in strategic growth verticals are positioning Hubbell for sustainable GDP plus growth as our economy becomes more electrified. In Utility

Solutions, we believe there is still plenty of runway and above average visibility to continued growth driven by long-term grid modernization trends. In Electrical Solutions, we expect residential markets to remain challenging but we believe that the 20% of segment revenues exposed to our strategic growth verticals in T&D, renewables, data centers and communications should prove resilient to cyclical dynamics. In Electrical Solutions, we plan to maintain elevated investment levels to support footprint optimization projects as we continue our multiyear journey as a unified operating segment with structurally higher long-term margin profile."

OptionsHawk Executive Summary & Focus Stocks

Hubbell (HUBB) is a top pick as I love its positioning in key growth vectors but also now at 17X EBITDA would want to see a pullback. **Carlisle (CSL)** is an annual favorite and continues to execute well with strong metrics and rising estimates despite a tougher environment in 2023. **Atkore (ATKR)** is a top small cap with strong margins, buying back stock, rising estimates and should see a lift from cost deflation. **Technoglass (TGLS)** is a small name with very impressive numers across the board that looks severely undervalued, a potential M&A target.

<u>Building & Construction – Branded Home</u>

Components: MAS, FBHS, AYI, TREX, UFPI, AWI, AZEK, DOOR, PGTI, JELD, AMWD

International & Private Peers: Elkay, Moen, Rohl, Riobel, Kohler, Lixil, Andersen, Assa Abloy, Plastpro, Therma-Tru, Pella

Intro

This group is very similar to the names above though we are looking more at names tied to Remodel/Decorative than New Construction with branded products often found in big box retailers like Home Depot and Lowe's such as Doors, Windows, Locks, Plumbing, Decking and more. The fundamentals of the Repair & Remodel markets remain resilient with home prices rising, new household formation, strong consumer balance sheets and an ageing US housing stock.

Across this group the weakness in housing is filtering through with lower volume seen in the face of rising cost pressures. Consumer demand is slowing in Paint & Plumbing. FBHS lowered its outlook in Water & Outdoor/Security while Cabinets was a source of strength and a unit being spun-off. Management expects global home products to decline low-to-mid single digits with weaker trends in 1H compared to 2H. TREX is a secular growth story with the conversion to composites ongoing but growth has stalled while carrying a premium valuation and is a more discretionary renovation segment. AYI sees growth normalizing in 2023 after a year of robust demand.

Industry Backdrop & Investment Considerations

These stocks generally can fall into categories based on exposure, such as single-family, as well as Repair/Remodel with DIFM (Do It For Me) or DIY (Do It Yourself). Favorable trends for new single-family construction include demographics, a shift to suburban living, low levels of inventory and the interest rate environment.

	Residential			Non-Residential			
	NC	R&R	Total	NC	R&R	Total	Other
AWI	0%	5%	5%	20%	75%	95%	0%
BECN	16%	47%	63%	9%	28%	37%	0%
BLD	70%	7%	77%	NA	NA	23%	0%
EXP	NA	NA	47%	NA	NA	46%	7%
FBHS	24%	48%	72%	NA	NA	12%	16%
IBP	75%	7%	82%	NA	NA	18%	0%
JELD	47%	43%	90%	NA	NA	10%	0%
MAS	11%	89%	100%	0%	0%	0%	0%
MHK	16%	58%	74%	NA	NA	26%	0%
MLM	NA	NA	22%	NA	NA	33%	45%
OC	13%	34%	47%	NA	NA	19%	34%
PGTI	53%	46%	99%	NA	NA	1%	0%
SKY	87%	0%	87%	NA	NA	5%	8%
SUM	NA	NA	33%	NA	NA	33%	33%
TREX	4%	86%	90%	NA	NA	10%	0%
VMC	NA	NA	20%	NA	NA	30%	50%
WSC	NA	NA	7%	NA	NA	35%	58%

The North American window and door market at approximately $12.4B skewed slightly towards residential repair and remodel relative to new construction, with some exposure to commercial. The windows and doors market is fragmented, with the top three producers, JELD-WEN, Andersen and Masonite accounting for approximately 47% share. The remaining 53% is spread among other large national players (Ply-Gem, Pella) and regional players and smaller, custom shops. Windows and doors tend to be among the more labor intensive building products industries, with distribution generally conducted on a regional basis rather than nationally. In addition, roughly 65-70% of all doors are classified as interior, with the remaining 30-35% exterior, according to industry estimates. Ducker Worldwide estimates that roughly 72% of windows are vinyl, 14% wood, 8% aluminum and 6% other.

The North American plumbing market is valued at approximately $7.9B, with demand skewed to residential repair and remodel activity.

The US cabinets market is valued at approximately $10.2B, with demand primarily driven by residential repair and remodel activity. The industry is fragmented, with 52% share attributable to regional and smaller family businesses.

Raw materials are a large component of costs to most of these companies though pricing can offset the impacts of inflation.

Indicators, Metrics & Stock Selection Framework

EBITDA Margins, ROIC, EV/EBITDA, EBITDA CAGR, FCF Yield, Debt/EBITDA

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Branded Home					#VALUE!		#VALUE!		#VALUE!	#VALUE!
MAS	Masco Corp	11.6B	9.68X	6.45%	-5.19%	17.47%	5.76%	42.87%	-10.83%	-1.60%
FBHS	Fortune Brands Home & Security Inc	8.1B	8.00X	3.35%	-5.31%	18.79%	5.62%	12.8%	-2.72%	-1.55%
AYI	Acuity Brands Inc	5.8B	9.24X	1.62%	2.39%	16.47%	8.49%	20.07%	18.78%	9.87%
UFPI	Ufp Industries Inc	5.1B	4.62X	14.26%	-8.96%	11.48%	11.13%	29.6%	26.59%	12.69%
TREX	Trex Company Inc	5.2B	16.93X	9.15%	-3.19%	17.0%	2.61%	47.55%	-28.34%	-20.63%
AWI	Armstrong World Industries Inc	3.4B	10.28X	10.56%	6.06%	32.31%	6.28%	15.85%	-6.07%	-0.51%
AZEK	Azek Company Inc	3.2B	14.72X	20.74%	8.05%	21.36%	5.62%	8.1%	-46.56%	-11.04%
DOOR	Masonite International Corp	1.7B	5.23X	9.04%	0.37%	15.38%	9.20%	17.15%	2.59%	1.67%
PGTI	PGT Innovations Inc	1.1B	6.27X	9.73%	0.31%	17.64%	#VALUE!	6.66%	15.34%	5.91%
AMWD	American Woodmark Corporation	0.9B	5.92X	(12.213%)	-8.52%	12.04%	10.80%	4.48%	117.72%	12.77%
JELD	Jeld-Wen Holding Inc	0.9B	6.15X	9.55%	-6.78%	8.99%	7.22%		-31.63%	-2.72%

Management Commentary

Masco (MAS) on weakening demand…. "Demand moderated more than expected in the third quarter, with most categories experiencing declining volumes year-over-year. Our operating profit was impacted by these lower volumes, higher operational costs, and unfavorable foreign currency. Moving on to the overall demand picture. POS and incoming orders slowed more than expected late in the third quarter across most of our product categories. And we anticipate this slowdown to continue into the fourth quarter. Our portfolio of lower ticket, repair and remodel-oriented products serves both DIY and Pro customers and we have product, channel, geographic and price point diversification to provide stability and resilience through a cycle. We've taken significant pricing actions and will continue to recover cost inflation experienced in 2021 and 2022 as certain commodities and cost pull back from their highs, such as copper, zinc and ocean freight. In terms of your question with regards to inventory and inventories in the channels, I would say that inventories are in pretty decent shape. I wouldn't say that they're overstocked or excessive. Some destocking is occurring across categories and channels for sure. But there's always movement in inventory levels, particularly in changing macroeconomic environments and changing markets like we have evens out usually around the end of the quarter."

Fortune Brands (FBHS) on housing environment…. "During the quarter, we saw a softening in U.S. single-family new construction and R&R as the Federal Reserve's continued action on interest rates started to have its intended effect on housing demand. We remain strong believers in the medium- to long-term market opportunity, underpinned by attractive demographics and a significant shortage of U.S. housing. We are expecting a soft start to 2023 and are focused on driving outperformance, while executing a tight set of strategic priorities. Rising interest rates are impacting single-family new construction permits and starts activity, and our wholesale and retail channel partners are destocking inventory as customer traffic slows and lead times normalize. As is well documented, there's a fundamental long-term need for housing in the U.S., as a deficit of millions of homes exists and the current age of homes today remain at or near multi-decade highs. We believe the importance of the home remains as strong as ever as consumers continue to invest in priority areas of the home, including the kitchen, bathroom and the outdoors. Our portfolio is targeted at the heart of the market and is exceptionally well positioned to navigate the challenges ahead and capitalize on consumers' continued desire to upgrade their homes."

OptionsHawk Executive Summary & Focus Stocks

Close tied to Residential and R&R makes this a tough set-up into 2023 for these stocks. High valuation names like **Trex (TREX)** and **Azek (AZEK)** have further to fall. **Armstrong (AWI)** with less residential exposure a top small cap showing durable forward growth and high margins. **Acuity (AYI)** looks alright at 9X EBITDA though growth is slow it does produce strong FCF and in a rising estimate cycle. O the very small caps **PGT (PGTI)** attractive at 6.25X with solid margins, FCF and rising estimates.

Building & Construction – Distributor & MRO

Resources: Industrial Distribution, MDM

Components: GWW, FAST, FERG, BLDR, WCC, BLD, SITE, AIT, MSM, IBP, GMS, GIC, BXC, DXPE, EVI

International & Private Peers: Winsupply, Hajoca, Ferguson, Motion Industries, Wurth Industry, Amazon B2B

Intro

Distributors benefitted from the supply chain and inflation environment in 2022. Lead times are improving and pricing power in distribution is starting to normalize after being at all-time highs over the past several quarters. The sustained strong industrial activity even with higher interest rates and deteriorating consumer conditions could also be a residual effect of unusually high backlog in short-cycle verticals that should start to normalize. Declining prices and a manufacturing slowdown will also be headwinds in 2023.

Industry Backdrop & Investment Considerations

The Industrial MRO market is estimated at $150B in North America ($380B Global) with Fasteners and Metalworking two key verticals in this highly fragmented industry that is closely tied to Manufacturing PMI.

The Electrical Distribution market is a $110B market closely tied to Industrial Production. There are key positive secular trends in Electrification, Data Networking and Remote Connectivity accelerating demand.

A rising IP/inflation environment generally buoys distributor topline/earnings growth, though the group typically meaningfully outperforms only during a downturn (when ISM <45) given sales/EPS tend to be more resilient due to the recurring nature of MRO (maintenance, repair, and operations) spend.

One of the most significant industrial distribution industry trends that businesses are quickly becoming aware of is the increased digital presence across the board. Amazon Business has been seen as a potential disruptor to the incumbents in this industry. Greater customer focus on MRO spend, a demographic shift to more Millennial/Gen X buyers, and the incursion of online entrants (e.g. AMZN) have made price transparency a key concern for the Industrial Distributors.

It is important to focus on distributors with leverage to higher-margin/less commoditized SKU categories.

Indicators, Metrics & Stock Selection Framework

EBITDA Margins, ROIC, EV/EBITDA, EBITDA CAGR, FCF Yield, Debt/EBITDA. Organic topline growth and gross margins are also key to this industry.

Valuation & Comps

EV/EBITDA to EBITDA Margins

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Distributor & MRO					#VALUE!		#VALUE!		#VALUE!	#VALUE!
GWW	WW Grainger Inc	29.6B	13.37X	8.0%	4.58%	16.62%	3.40%	18.36%	20.20%	6.20%
FAST	Fastenal Company	28.7B	18.04X	7.84%	3.48%	23.49%	2.49%	9.24%	4.44%	2.48%
FERG	Ferguson PLC	27.0B	10.12X	(0.896%)	0.66%	11.66%	7.15%	22.35%	7.24%	6.16%
BLDR	Builders FirstSource, Inc.	9.9B	3.04X	(0.165%)	-29.45%	20.34%	29.80%	41.81%	78.47%	10.96%
WCC	WESCO International, Inc.	6.5B	6.86X	(1.476%)	3.78%	8.55%	5.23%	7.2%	38.32%	8.83%
SITE	SiteOne Landscape Supply Inc	5.6B	12.67X	6.59%	0.27%	12.3%	#VALUE!	20.29%	1.76%	4.66%
BLDR	Builders FirstSource, Inc.	9.9B	3.04X	(0.165%)	-29.45%	20.34%	29.80%	41.81%	78.47%	10.96%
AIT	Applied Industrial Technologies Inc	5.0B	12.16X	4.66%	2.96%	11.27%	#VALUE!	13.0%	27.13%	13.63%
MSM	MSC Industrial Direct Co Inc	4.7B	9.65X	0.94%	1.88%	15.31%	8.33%	8.87%	4.64%	5.42%
IBP	Installed Building Products Inc	2.6B	7.64X	1.91%	-5.66%	16.72%	5.21%	15.59%	31.27%	12.02%
GMS	GMS Inc	2.4B	5.42X	(18.381%)	-10.41%	13.66%	16.65%	17.4%	22.15%	13.67%
GIC	Global Industrial Co	1.0B	8.60X	8.38%	-0.59%	9.55%	#VALUE!	(32.435%)	18.29%	9.65%
BXC	BlueLinx Holdings Inc.	0.6B	2.01X		-19.96%	9.18%	48.53%	39.52%	56.71%	11.01%

Management Commentary

Grainger (GWW) on a dynamic industrial market…. " I've also visited some of our aerospace customers where it's clear that business activity has picked up, especially in 2022 as COVID impacts have diminished. The industry is now making investments in new airplanes and other equipment to meet ongoing changes in business and leisure travel demands. All told, we continue to experience a dynamic market, with some industry still on the upswing, some that are stabilized and others that are trending down. And while our customers will face different levels of impact as we navigate through this inflationary period, we know that Grainger wins because of our ability to add tangible value to our customers' operations through inventory management, digital solutions and product substitutes. This has been true in past economic cycles, and we expect to continue as more and more customers turn to us for solutions, thanks to our relevant product offering, know-how and advantaged supply chain."

Builder First Source (BLDR) on M&A and builder trends…. "We have spent approximately $630 million on M&A so far this year. The highly fragmented nature of our industry supports our ambition to invest on average $500 million per year for the next several years while deploying capital in a disciplined manner. As we navigate near-term market dynamics, we will continue to be acquisitive where valuations make sense. As we have all seen in the public builder announcements, the commentary has suggested a 30% to 40% decline in order rates on average. While we had very strong third quarter results, we have begun to see a slowdown in average daily sales as higher mortgage rates and declining consumer confidence are weighing on demand and commodity prices. Our September and preliminary October volumes were down low double digits versus a year ago, amid a significant decline in early-stage build products."

WESCO (WCC) on secular trends…. "We're benefiting from a series of secular trends that are very attractive, electrification, automation and IoT, 24/7 connectivity green energy, grid modernization, supply chain consolidation that our customers are driving and near-shoring, reshoring. Remember, we're a leading B2B distribution company that has very strong free cash flow across the cycle. Obviously, we've been investing significantly in our inventory to support all-time record backlog, growing at a much higher rate than sales, and we're very confident in the fundamental cash flow characteristics of the company. We've got an open $1 billion share buyback authorization. I want to emphasize at this stock price, we are buyers of our stock at these levels."

SiteOne (SITE) on mix and market share gains…. "As the only national full product line wholesale distributor in the market, we also have an excellent balance across our product lines as well as geographically. Our strategy to fill in our product lines across the U.S. and Canada, both organically and through acquisition, strengthens and reinforces this balance over time. Overall, our balanced end market mix, broad product portfolio and good geographic coverage offer us multiple avenues to grow and more ways to create value for our customers and suppliers, while providing important resiliency in softer markets. I would note that our balanced business mix will be very important as we navigate through 2023 and seek to overcome the expected softness in new residential construction. As we look ahead to 2023, we now believe that inflation will be more persistent, which will help mitigate the softer residential market and continued pressure on volume. Overall, we remain confident in our ability to navigate through any market conditions, outperform the market and continue to build our company both organically and through acquisition."

OptionsHawk Executive Summary & Focus Stocks

Of the three large distributor names **Grainger (GWW)** continues to look undervalued with stronger growth seen ahead than **Fastenal (FAST)** and seeing much stronger estimate revisions. FAST continues to have stellar margins but if GWW can close that gap it should re-rate higher. The building materials names are in a tough part of the cycle and would likely avoid them at these value trap levels. **WESCO (WCC)** falls into the value name buy group at < 7X but not overly impressed with the forward-growth or margins.

<u>Building & Construction – HVAC, Energy & Elevator</u>

Components: JCI, TT, CARR, OTIS, WSO, AOS, LII, GNRC, FIX, AAON

International & Private Peers: KONE Oyj, Schindler Group, TK Elevator, Daikin, GC Midea, Gree Electric, Rheem, Hitachi

Intro

This group includes companies involved with HVAC, Refrigeration and Fire/Security. HVAC provides products, controls, services and solutions to meet the heating and cooling needs of residential and commercial customers, while enhancing building performance, energy efficiency and sustainability.

HVAC remains a strong & resilient industrial sub-industry with stimulus boosting orders, price/cost leading to margin expansion in 2023 and lead times & inventories normalize. CARR's strong positions in heat pumps and improving service attachment also serve as a counterweight to cyclical volume risk. The Inflation Reduction Act, broad infrastructure/climate investments and further incentives in the EU around heat pumps (limit use of Russian gas) should help the industry grow in 2023 despite headwinds from the residential replacement cycle. Further, within broader infrastructure/fiscal spending, the Elementary and Secondary School Emergency Relief Fund (ESSER) still has room to play out with still a small portion of the ~$120B+ allocation being spent. Residential is likely the area that faces the most pressure in 2023 (LII, AOS). Residential channel partners further de-stock into year-end given normalizing lead times and a deflationary backdrop. GNRC management cited lead times for home standby generators have come down to normalized levels compared to 8-10 weeks last quarter, with significant backlog.

Industry Backdrop & Investment Considerations

North American residential heating, ventilation and cooling (HVAC) market is valued at approximately $33B, with approximately 80% exposure to the repair and replacement end-market and 20% to new construction. TT, CARR and LII account for a 65% market share. Industry trends indicate that energy efficiency and environmental regulation along with the use of cloud-based technology are contributing to growth, particularly for retrofit markets.

Rising customer inclination toward comfort has increased the demand for HVAC systems. In addition to addressing the customer's comfort demands, companies are developing products that offer several added benefits. For instance, IoT-enabled heating and cooling systems offer real-time monitoring of system functionality and condition. These HVAC systems also alert customers or managers on system failure, unusual behavior, and maintenance cycle to reduce repair costs. Climate change is one of the prominent factors influencing the growing adoption of heating and cooling equipment. Due to unpredictable climatic conditions and rising temperatures, several customers consider HVAC equipment as a beneficial investment.

The US installed base for HVAC units reached 115M with only 10-15% of industry shipments tied to new construction, a 3.6% CAGR for installed based since 1980 and 4.3% CAGR for shipments.

Key trends across the industry include Health Buildings, Decarbonization and Smart Buildings which are seen as a $250B incremental opportunity over the next decade. Smarter technology is a huge driving factor behind the improvements being made in the HVAC industry today. The industry is beginning to automate sales and services processes to help cut costs can and keep prices competitive. Additionally, smart technology like mobile apps allow building managers to control HVAC technology from one centralized point. With this smart tech, HVAC technology will be able to make advances such as being able to identify and alert you when maintenance is needed, or even submitting a work order for maintenance automatically.

Indicators, Metrics & Stock Selection Framework

EBITDA Margins, ROIC, EV/EBITDA, EBITDA CAGR, FCF Yield, Debt/EBITDA

Valuation & Comps

EV/EBITDA to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
HVAC, Energy, Elevator										
JCI	Johnson Controls International PLC	45.7B	12.91X	8.64%	4.77%	16.57%	4.57%	4.98%	7.16%	3.48%
TT	Trane Technologies PLC	40.6B	16.59X	4.8%	3.79%	18.5%	4.04%	10.99%	1.91%	3.58%
CARR	Carrier Global Corp	37.1B	12.94X	6.41%	6.28%	17.67%	3.65%	12.67%	2.63%	2.18%
OTIS	Otis Worldwide Corp	33.7B	17.09X	5.84%	1.68%	17.67%	3.95%	104.45%	-4.44%	-7.35%
WSO	Watsco Inc	11.9B	14.68X	(0.983%)	1.92%	11.66%	4.03%	5.79%	17.15%	6.33%
LII	Lennox International Inc	9.4B	14.89X	6.97%	1.00%	16.68%	3.34%	38.36%	-0.07%	5.08%
AOS	A O Smith Corp	9.1B	12.43X	4.21%	-0.87%	18.36%	4.61%	21.32%	-12.68%	-9.20%
GNRC	Generac Holdings Inc.	6.3B	8.95X	28.08%	-7.52%	16.89%	2.98%	27.17%	-26.01%	-8.31%
FIX	Comfort Systems USA, Inc.	4.3B	14.35X	7.76%	7.31%	9.02%	#VALUE!	12.52%	6.87%	10.97%
AAON	Aaon Inc	4.2B	27.57X	13.85%	15.39%	18.99%	#VALUE!	10.7%	6.12%	22.08%

Management Commentary

Johnson Control (JCI) on its segments…. "So you have 2 business models today in the industry, one which is your product manufacturer and you sell to the channel. We have a division like this, it's called the product division. It's about $10 billion out of the $26 billion we have as a revenue in the company. And this product division is doing very well, gaining share, we mainly present in the HVAC market. We gained about in commercial HVAC, 1.5 points of share, and we gained, for example, in China, 4 points of share. So this division doing HVAC, doing also fire and security is doing very well. And then you have another division, $16 billion, which is in the solution space. And to answer to the question from Tim, why do we believe it's a superior model. We believe it's a superior model because you cannot solve the problems that our customers have without offering a solution. You cannot solve sustainability, indoor air quality, you cannot solve for cost if you don't orchestrate a 360 solution. We're in HVAC, we're in fire, we're in security, and we're in control. So it's a broad portfolio of assets, for number one. But number two, we install those products, connect those devices, create customer intimacy. Number three, we collect this data and analyze the data in what we consider the best digital platform in the industry, OpenBlue. And then we have the ability to act on this data directly ourselves because we have the largest fleet of engineers in the industry. So we have to summarize 2 business models, a product division doing well, gaining share, improving margin year after year, and the solution business, which is a one-stop shop, which we believe is a key differentiator."

Trane (TT) on Commercial HVAC…. "Bookings continue to be particularly strong in commercial HVAC businesses globally. Our global commercial HVAC business is up more than 40% on a 2-year stack. Our Americas commercial HVAC business is even stronger, up more than 50% on a 2-year stack. Strong broad-based bookings growth over the past 7 quarters have driven our backlog to unprecedented levels with backlog of $6.4 billion at the end of the third quarter. We expect backlog to remain at elevated levels well into 2023. Turning to EMEA. We continue to see strong demand for our innovative products and services that help reduce energy intensity and greenhouse gas emissions for our customers despite the challenging macro backdrop. EMEA commercial HVAC orders were up low teens, and revenues were up in the mid-20s, reflecting strong demand across the portfolio, particularly for our thermal management systems, which are 3 to 4x more efficient than conventional heating and cooling. Energy efficiency, decarbonization and sustainability megatrends continue to intensify and create record levels of demand for our innovative products and services. We are uniquely positioned to deliver leading innovation that addresses these trends and accelerates the world's progress, supported by our business transformation and our engaging uplifting culture."

Carrier (CARR) on investments into its digital platforms… "We have 2 key digital platforms that we're investing a lot in building out Abound for buildings, Lynx for cold chain. And what we've committed to is very strong growth in our aftermarket, and we used to grow in the 1% to 3% range. We've been consistently growing at double digits as we've leaned into it into aftermarket focus. And what we said is that we were $4.5 billion of aftermarket sales last year, and we'll be at $7 billion in 2026. So a lot of traction and a lot of focus on the aftermarket and recurring revenues. The third theme we have is productivity. We've spent a lot of time and energy on simplifying our focus that includes portfolio with the subtraction of Chubb, the addition of Toshiba. And I think one piece of good news for sure next year is going to be commodity tailwind as we go into next year. So productivity is very thematic for us, 2% to 3% productivity as a whole each year, but 5% operationally."

OptionsHawk Executive Summary & Focus Stocks

This group looks pretty straightforward with **Carrier (CARR)** and **Johnson (JCI)** at cheaper valuations than **Trane (TT)** and **Otis (OTIS)** despite a better forward growth outlook and comparable margins. The midcap names are entering a growth slowdown and not overly attractive. **Generac (GNRC)** now at less than 9X EBITDA goes into the value buy group as the multiple has contracted and estimates may come down a bit further, but the long-term bull story is firmly intact. **Aaon (AAON)** is the most attractive growth story but does trade 27.5X which is too high.

<u>Building & Construction – Tools</u>

Components: SNA, SWK, ALLE, LECO, SSD, REZI, GFF, HLMN, EPAC, JBI, TNC, NSSC, LXFR

International & Private Peers: Koki, Stihl, Husqvarna, Makita, Bosch, Techtronic, Apex Tools

Intro

Weakness is expected to hit residential exposure while non-residential is likely to see some spill over as well. Like other industrial groups price raises will flow through in 2023 as costs come down leading to better operating profits and margins.

SWK's Tools & Outdoor segment is expected to see slowed demand in the near future along with compressed margins. SNA is an interesting set-up into 2023 as consumers look to get more miles out of vehicles and its exposure to automotive repair should be a nice tailwind. LECO has been making a push into better growth opportunities in Automation via acquisitions and targets $1B of Automation revenues by 2025. ALLE is starting to see benefits of pricing actions and has favorable exposure to late cycle non-residential and Education stimulus.

Industry Backdrop & Investment Considerations

There are 18 tool companies globally that own around 90% of the $51B global hand & power tool market. The global power tools market is valued near $36B and seen reaching $46.5B by 2025 with 200 million electric and 88 million pneumatic. The global hand tools market is valued closer to $18B.

Key growth trends cited by companies in this group include ecommerce as a distribution channel, reconnection with the home & garden, electrification, and health & safety.

Indicators, Metrics & Stock Selection Framework

EBITDA Margins, ROIC, EV/EBITDA, EBITDA CAGR, FCF Yield, Debt/EBITDA

Valuation & Comps

EV/EBITDA to ROCE

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Tools					#VALUE!		#VALUE!		#VALUE!	#VALUE!
SNA	Snap-on Incorporated	12.6B	10.16X	5.15%	2.20%	28.51%	0.67%	12.19%	8.35%	2.35%
SWK	Stanley Black & Decker, Inc.	12.2B	12.38X	31.16%	-4.09%	9.59%	-3.11%	10.8%	-63.93%	-13.43%
ALLE	Allegion PLC	9.8B	16.34X	7.61%	7.43%	23.57%	4.27%	19.0%	-3.27%	6.20%
LECO	Lincoln Electric Holdings Inc	8.5B	12.85X	2.82%	5.24%	18.44%	3.63%	18.86%	13.71%	5.51%
SSD	Simpson Manufacturing Co, Inc.	4.1B	8.64X	22.78%	-6.37%	25.11%	8.04%	28.2%	35.44%	37.94%
REZI	Resideo Technologies Inc	2.4B	4.60X	14.83%	1.71%	11.06%	#VALUE!	9.06%	-0.74%	4.81%
GFF	Griffon Corporation	2.1B	7.91X	(0.354%)	0.85%	17.61%	11.64%	(1.843%)	75.73%	5.96%
HLMN	Hillman Solutions Corp	1.5B	11.60X	10.13%	0.73%	15.58%	1545.39%	3.58%	576.92%	5.65%
JBI	Janus International Group Inc	1.6B	9.93X	5.63%	3.79%	24.1%	6.24%	5.17%	38.89%	16.52%
EPAC	Enerpac Tool Group Corp	1.3B	12.50X	7.22%	3.69%	21.12%	5.69%	12.27%	39.53%	0.77%
TNC	Tennant Company	1.2B	10.62X	9.25%	4.64%	12.86%	#VALUE!	11.44%	-17.57%	-5.27%
NSSC	Napco Security Technologies Inc	1.0B	26.06X	46.25%	15.67%	19.51%	#VALUE!	29.35%	68.18%	22.60%
LXFR	Luxfer Holdings PLC	0.4B	7.54X		2.30%	16.07%	#VALUE!	9.92%	-2.86%	-4.63%

Management Commentary

Snap-On (SNA) on demand and wages…. "Wages continue to grow, and they simply reflect the increased demand for the skills that are now necessary to complete critical repair. It's never been more evident that repairing a modern vehicle with the new technology is difficult. It's an exercise of extraordinary skill. And the salaries are rising to show it. Auto repair is resilient. When I meet up with the people at the shop, as I often do, our franchisees and our technician customers, you can feel their exhilaration in the now and their confidence in the future. And they're making sure they can participate in that future by being ready with the tools they need. Vehicle repair, it's a space filled with opportunity. You can hear it in the optimism in the voices of the shop, and you can see it clearly confirmed in Snap-on's performance. But it's not just the techs, shop owners are also a big -- shop owners and managers are also big players in the rise to repair. And our repair systems and information group or RS&I is positioned to take advantage. Everybody knows that cars are scarce. New and used. But for Snap-on, that doesn't matter. Repair and collision shops are busy. It's a tune we like very much. And it's evident in the rising sales of our undercar equipment and collision businesses, both strong."

Stanley (SWK) on its portfolio transformation…. "You can see that about half of that business is made up of power tools and then the remainder is a quarter of outdoor power equipment, and hand tools and storage and accessories is the other 25% roughly. Industrial still is an important part of our company and a large component of Industrial is engineered fastening as you can see, about 75% of that total portfolio, which serves the auto industry, aerospace industry and then general manufacturing infrastructure, which is primarily attachment tools. And we sold our oil and gas business a few months ago that closed. So as I said, these are all great things to do to really make our company more efficient, improve the profitability, but we have to grow over the long term, too. And so on the next page, you'll see a little more color on that. The transformation is really about reducing complexity. As I had mentioned, $2 billion of savings over a 3-year time horizon, optimizing our corporate structure, focusing our operating model and really transforming our supply chain, as I just touched on. We need to go harder in electrification as in many of those categories are moving quickly from small gas engines to battery-operated solutions."

OptionsHawk Executive Summary & Focus Stocks

Snap-On (SNA) screens as a good addition to the value buys at 10X EBITDA with positive growth and leading margins while its exposure to more automotive repairs in a recession can provide upside. **Allegion (ALLE)** is the usual best-in-class name but at 16X with headwinds to growth a likely avoid in 2023 while **Lincoln (LECO)** at 12X pretty attractive seeing strong positive revisions. **Simpson (SSD)** is a consistent favorite but I worry about exposure to residential and R&R headwinds. **Griffon (GFF)** is a small cap favorite with it having major value to unlock in a likely upcoming transaction. **Enerpac Tool (EPAC)** screens cheap at 12X for solid growth and high margins while **Napco (NSSC)** a high growth, high valuation name that is seeing major upside revisions and is a real solid company.

Building & Construction – Building Materials

Resources: [Quarry News]

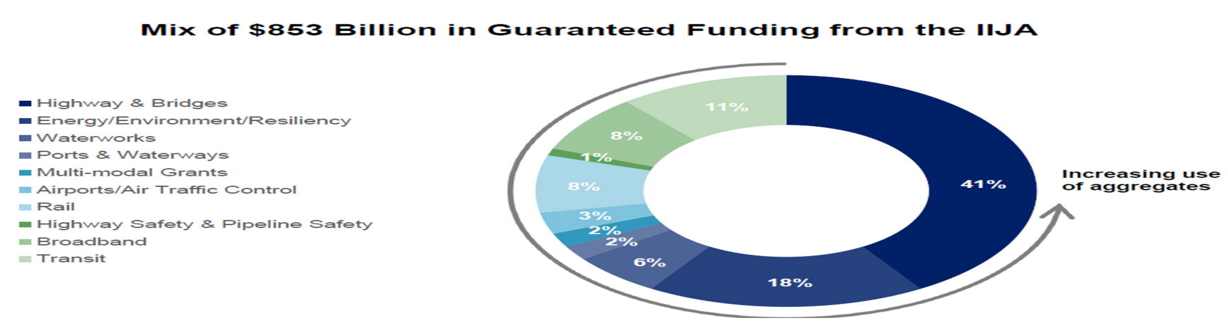
Components: CRH, VMC, MLM, CX, MDU, EXP, LPX, SUM, BCC, LOMA, TSE, USLM, ASPN

International & Private Peers: Sika, Saint-Gobain, Holcim, Heidelberg Cement, China National Building

Intro

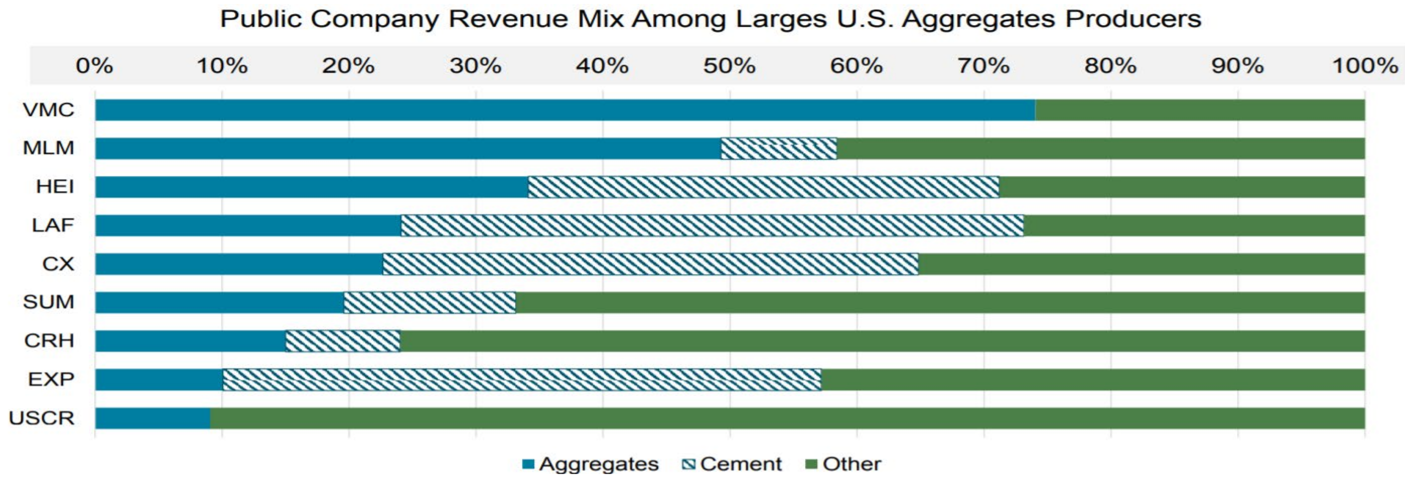
Aggregates have attractive businesses with logistical moats, limited substitutions, barriers to entry, price over volume, bolt-on M&A in a fragmented industry and are domestic-focused. Residential is the key overhang while infrastructure exposure a positive. Highways contribute 20-25% of shipments and other non-building infrastructure 10-15% of shipments from VMC and there are encouraging signs for public infrastructure. CRH sees a 'robust outlook' for infrastructure supported by rising funding and positive bidding momentum. It sees the residential slowdown as short and shallow while non-residential supported by government stimulus and reshoring efforts. Total aggregates volume is likely down in 2023 due to the weight of the residential slowdown but pricing remains favorable.

VMC has acknowledged single-family softness but citing record low home inventories, strong population growth and resilient household formations across its key markets. VMC's Non-Residential end markets were characterized as still in 'growth mode' - with an initial recovery in 2021 complemented by more structural tailwinds that have continued to support the market in 2022 (e.g. manufacturing, re-shoring, battery/chip facilities, etc.). VMC called out the $853B IIJA funding as a significant driver of expected future growth across its end markets - with ~41% of the funding allocated towards the aggregates-intensive highways/bridges market. VMC sees healthy pricing momentum heading into 2023 after its price/cost spread turned positive earlier in 2022.



Industry Backdrop & Investment Considerations

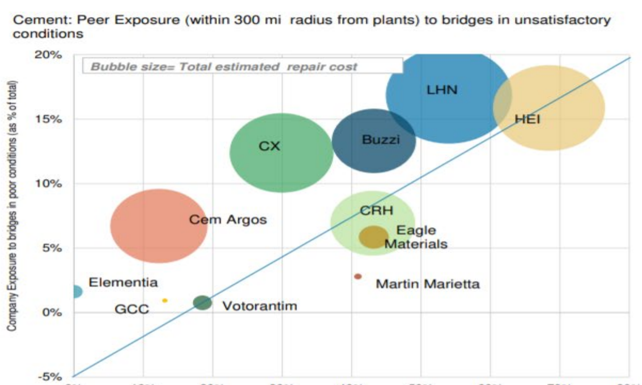
Aggregates are used in virtually all types of public and private construction, practically no substitutes for quality aggregates exist, and significant barriers to entry exist in most markets. Aggregates have shown strong pricing consistently over long periods of time with demand around 50% Private and 50% Public. Private demand is being driven by the imbalance of housing stock and housing demand as well as growth in population and household formations. Public demand is being driven by changes in state and local funding, the multi-year federal transportation bull, record tax receipts and increased awareness for the need to invest in infrastructure. Aggregates have a high weight-to-value ratio and, in most cases, must be produced near where they are used; if not, transportation can cost more than the materials, rendering them uncompetitive compared to locally produced materials.

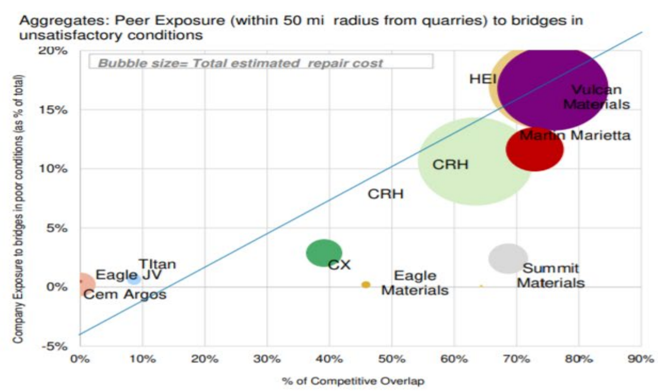


Population and economic growth along with the need to continually build and maintain the built environment are among the fundamentals driving demand for materials and products. Products can be found in a wide range of construction projects from major public infrastructure to commercial buildings and residential structures.

The world's population is projected to grow by two billion people by 2050, with urban areas expected to account for the majority of this increase. By 2050 68% of the world's population will live in urban environments, an increase of 12% on today's numbers. Construction-related spending currently accounts for 13% of global GDP. Economic development and growth drives investment in residential, infrastructure and commercial projects from the houses, roads, bridges, ports and airports that serve our growing cities to office blocks, retail centers and industrial and leisure complexes.

Infrastructure spending will be driving investment and can see exposure across each kind of infrastructure spending.





Indicators, Metrics & Stock Selection Framework

EBITDA Margins, ROIC, EV/EBITDA, EBITDA CAGR, FCF Yield, Debt/EBITDA

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
Building Materials					#VALUE!		#VALUE!		#VALUE!	#VALUE!
CRH	CRH PLC (ADR)	29.7B	6.23X	6.71%	1.17%	15.31%	7.80%	5.78%	1.81%	1.23%
VMC	Vulcan Materials Company	24.7B	17.36X	12.84%	6.59%	24.28%	2.26%	5.22%	-15.05%	6.59%
MLM	Martin Marietta Materials Inc	22.9B	16.86X	9.67%	9.85%	29.43%	2.86%	6.45%	-7.76%	-0.81%
CX	Cemex SAB de CV (ADR)	6.1B	0.25X	9.09%	4.77%	16.48%	252.87%	4.29%	1.97%	5.54%
MDU	Mdu Resources Group Inc	6.3B	10.46X	5.32%	6.34%	15.02%	#VALUE!	3.6%	-13.24%	14.96%
EXP	Eagle Materials Inc	5.2B	8.34X	(2.045%)	-0.71%	37.52%	8.62%	16.6%	30.16%	16.51%
LPX	Louisiana-Pacific Corp	4.7B	3.19X	12.17%	-22.37%	23.47%	16.00%	114.45%	-5.42%	-6.48%
SUM	Summit Materials Inc	3.7B	9.58X	9.93%	3.01%	26.95%	5.43%	4.17%	-19.33%	-3.11%
BCC	Boise Cascade Co	2.9B	1.95X	13.26%	-15.17%	15.13%	15.67%	49.85%	50.90%	8.69%
LOMA	Loma Negra Compania Indl Argntna SA-A	1.5B		33.04%	81.87%	22.12%	#VALUE!	6.27%	#######	16.65%
TSE	Trinseo PLC	0.9B	8.48X	22.87%	-5.68%	(3.107%)	#VALUE!	8.62%	-99.87%	-2.67%
ASPN	Aspen Aerogels Inc	0.8B	-12.21X		38.32%	(63.172%)	690.69%	(76.408%)	130.15%	43.73%
USLM	United States Lime & Minerals Inc	0.8B			#VALUE!	38.22%	#VALUE!	20.84%	0.00%	0.00%

Management Commentary

Vulcan (VMC) on pricing and demand environment…."Current pricing momentum and the visibility into future public demand growth will support a positive pricing environment for the remainder of 2022 and into 2023. We see both challenges and opportunities in the future demand environment, with different dynamics impacting each end use. Single-family housing is facing considerable headwinds, but multifamily housing and private nonresidential starts still show growth. On the public side, leading indicators for highways and other infrastructure are reflecting strong tax revenues and increased funding from the Infrastructure Investment and Jobs Act. Permits and starts are declining, albeit at slower rates in Vulcan-served markets than the country as a whole. Multifamily permits and starts remain positive. It's important to remember that residential construction activity remains at high levels. Also household formations and limited inventories may dampen the magnitude and duration of weakness in residential demand. Additionally, leading indicators remain positive with the Architectural Billings Index, or ABI, still greater than 50, and the Dodge Momentum Index at high levels. On the public side, we are in growth mode. Trailing 12-month highway starts are up 14%, and other infrastructure starts are up 18%. In fact, July and August were the 2 largest single months for highway awards in the last 10 years. The timing of starts converting to aggregate shipments will be a critical variable impacting next year's demand for aggregates. As we look into 2023, we expect that the current strength in private nonresidential construction activity and increased public funding will help to offset contracting residential demand. We also carry strong pricing momentum into 2023. Our teams will be finalizing their annual planning over the next few weeks, and we'll share with you our full year outlook on 2023 in February."

OptionsHawk Executive Summary & Focus Stocks

Martin Marietta (MLM) is the preferred large cap in this group as a best-in-class operator still set to deliver solid growth with plenty of tailwinds and strong pricing power. **Summit (SUM)** an attractive small cap that would make a nice acquisition target with its strong margins. **Aspen Aerogels (ASPN)** is a high growth name that lacks profitability, making it risky, but has exposure to the EV growth trend.

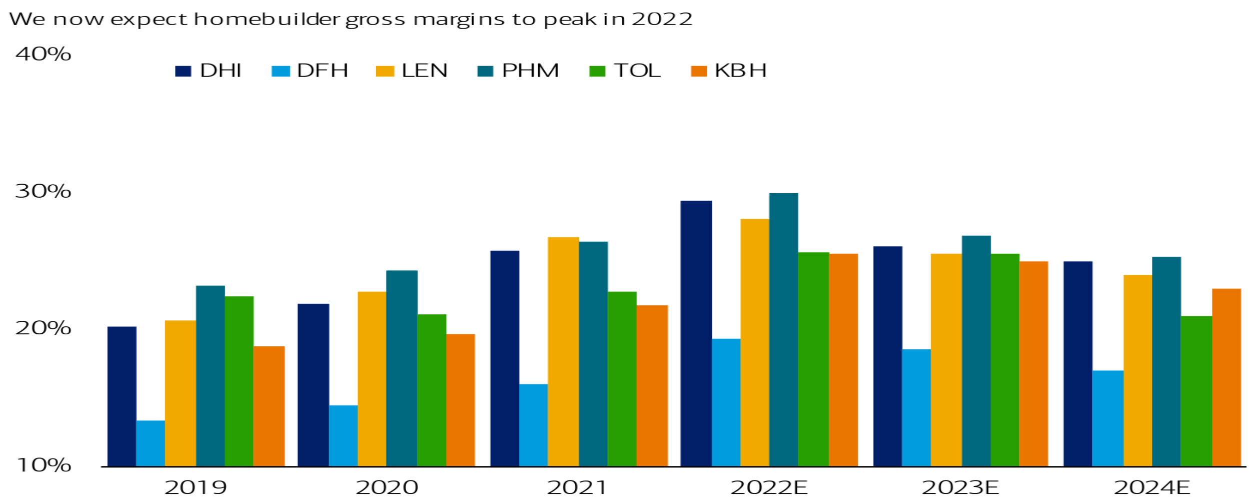
Building & Construction – Construction

Components: DHI, LEN, NVR, PHM, TOL, TMHC, SKY, MTH, KBH, MDC, LGIH, CVCO, TPH, CCS, MHO, DFH, GRBK, FOR, LEGH, BZH, HOV

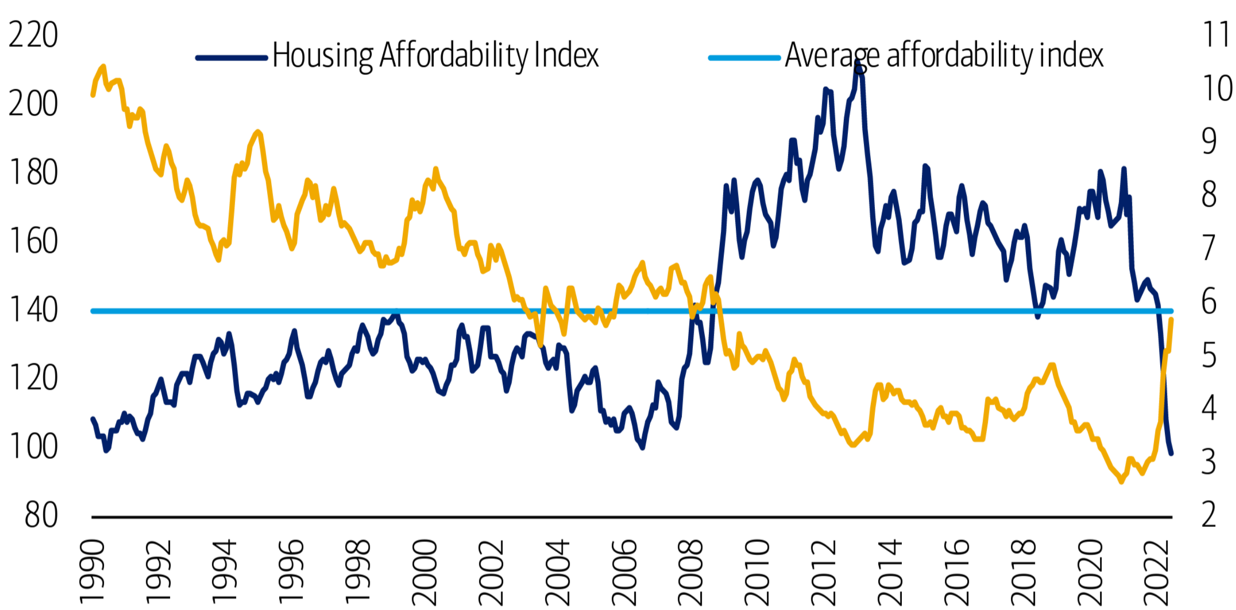
International & Private Peers: Strabag, Eiffage

Intro

It is no secret at this point that Homebuilders are seeing a sharp slowdown in activity due to the surge in mortgage rates after facing considerable supply chain and cost pressures. The longer-term dynamics for the US Housing market remain very favorable as we have seen cited across management commentary in related industries. Homebuilders have offset significant supply chain bottlenecks and input cost inflation through price increases but there is a Homebuilders have offset significant supply chain bottlenecks and input cost inflation through price increases. The group certainly faces risks of weaker margins if home prices turn negative in 2023 which would further weigh on multiples while a double-impact from peak earnings.



Weakening consumer confidence and lower affordability are weighing on the demand side that may force public builders into incentives given the weak absorption pace and a significant amount of new unsold inventory scheduled to be completed later this year. Based on commentary from homebuilders, industry data, and home price trends, most West Coast and Mountain region markets are slowing at a faster pace than the national average. In general, markets that have experienced the strongest home price growth over the last two years are now seeing the sharpest pullback in demand. Housing affordability is now well-below the long-term average of 140.4 and at record low levels.



Industry Backdrop & Investment Considerations

The residential construction industry features a few builders at a National scale and then a lot of local builders. It is important to focus on geographic regions and the products these builders are exposed to for proper analysis. The homebuilding business is seasonal in nature and generally reflects higher levels of new home order activity in the second and third fiscal quarters and increased deliveries in the second half of the fiscal year.

The top ten homebuilders tend to focus on certain categories. Some of the companies under our review cater to the affluent market, providing luxury homes. Others focus strictly on the entry-level category, in which buyers heavily base their purchase decision on their ability to secure affordable financing. A majority of homebuilders, though, concentrates on the "first-time" segment. Here, the average home price is modestly higher than that of an entry-level model. This segment includes another appealing business venue, the first-time move-up market. The industry is highly fragmented. At the peak of the last housing cycle (in 2006), the ten biggest domestic homebuilders accounted for only about 35% of housing starts. There are hundreds of small, privately financed builders that operate solely at the regional level, pursuing niche market opportunities. One major advantage big industry players have over their smaller counterparts is the ability to easily obtain debt and equity financing for large land purchases and construction projects. They have the clout to secure access to the nation's most desirable living locations.

Consumer confidence, employment growth and wage growth are a few of the most relevant economic metrics for the homebuilding industry. Other important considerations are overall economic growth expectations, household formation trends and the relative level of mortgage rates and home prices versus rental costs.

Homebuilding stocks have historically outperformed in periods of declining rates. Household formation has been improving and job growth remains healthy along with wage inflation. Millennials represent the key cohort for buying demand in the next few years. In the US, people under the age of 35 have an average homeownership rate of 40.2%, well below the national 67.4% level. Look for Millennials to increasingly shift from rentals, adding to demand for housing.

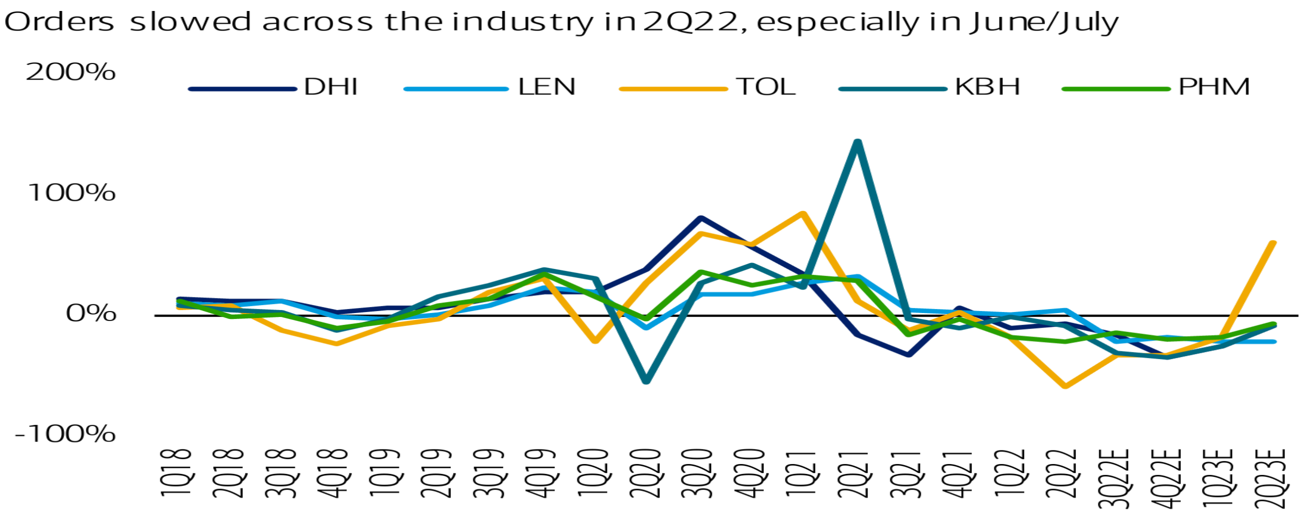
Flexible work arrangements will have people spending more time at home, even as vaccines are distributed, and local economies reopen. This will contribute to a sustained increase in the value for more space.

Gross margins for the homebuilders remain under pressure driven by persistently high land prices, rising costs associated with lot entitlement and development, as well as labor and materials. Volumes will be key to leveraging overhead costs. Lumber is the largest material cost to a home at approximately 15%. As such, significant moves in the price of OSB and softwoods can provide meaningful head/tailwinds for the builders.

Indicators, Metrics & Stock Selection Framework

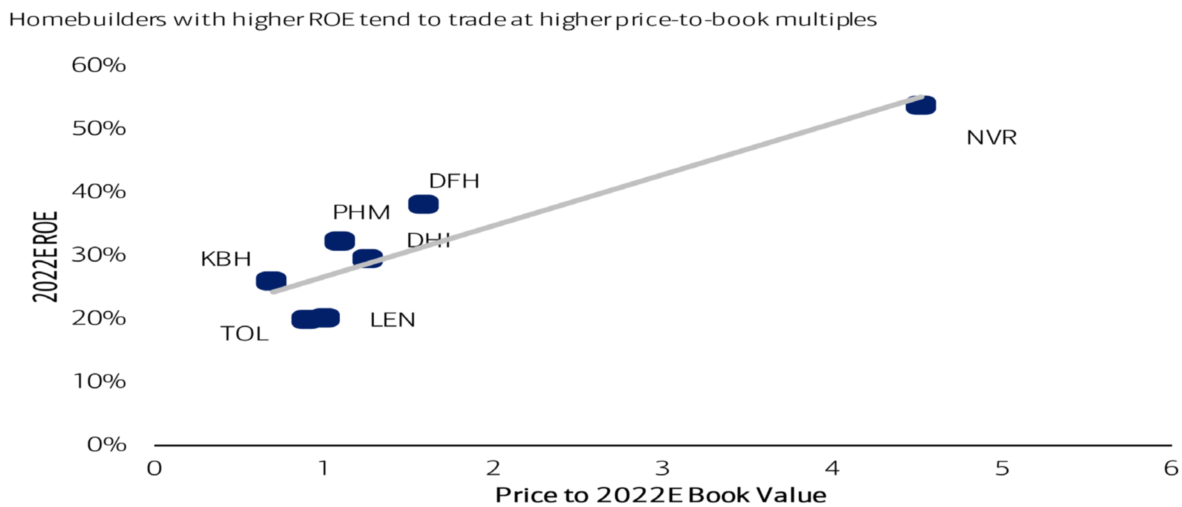
Homebuilders have a lot of industry-specific metrics such as cancellation rates, pricing on homes sold and Backlog is always in focus. Given the deep cyclicality in housing, EPS can be volatile, with a wide range of outcomes between peak and trough. The stability in book value provides for a more consistent metric through the cycle while ROE is a favored metric.

ROE, EBITDA Margins, ROIC, EV/EBITDA, Price/Book, EBITDA CAGR, FCF Yield, Debt/EBITDA



Valuation & Comps

Price/Book to 3 Year ROIC



Management Commentary

DR Horton (DHI) on moderating demand…. "During most of the year, demand for our homes was strong. In June, we began to see a moderation in housing demand that has continued and accelerated through today. The rapid rise in mortgage rates, coupled with high inflation and general economic uncertainty, have made many buyers pause in their home buying decision or choose to not move forward with their home purchase. However, the supply of both new and resell homes at affordable price points remains limited and the demographics supporting housing demand remained favorable. We will continue to focus on turning our inventory and managing our product offerings, incentives, old pricing, sales pace and inventory levels to beat the market, optimize returns, increase market share and generate increased cash flow from our homebuilding operations."

Pulte (PHM) on demand…. "As we move throughout the quarter, you could almost see demand ebb and flow with the movement of interest rates. Softness in July's homebuying demand eased as mortgage rates fell in August. The positive trend in demand was short-lived, however, as interest rates surged higher in September in response to Federal Reserve actions and hawkish commentary from Chairman Powell. The pullback in demand was widespread across geographies and consumer groups as potential home buyers move to the sidelines, some because they can no longer afford a home and others because they were unsure if now it's truly the best time to buy a home. The impact of consumers dealing with issues of financing or fear also extended to our backlog as cancellation rates increased to 24% in the quarter. While there are a number of factors influencing housing demand, the rise in mortgage rates has likely had the most significant impact on today's consumers. As mortgage rates have moved even higher, incentives have extended to other areas, including more aggressive discounting of standing inventory and price reductions. As we move through the third quarter, absorption paces were choppy but on average, slowed as the quarter progressed. This trend continued into October, although ongoing adjustments to incentives and pricing are gaining some traction with consumers. We've told our divisions to be strategic in their decision-making, but we need to intelligently find the market and turn our inventory. The reality is that we can't be margin proud, but rather, we need to protect our share of sales within the markets."

OptionsHawk Executive Summary & Focus Stocks

This is obviously a very tough group to buy and hold in any market but particularly into 2023 with peak 2022 margins and every name seeing EBITDA down the next two years as higher rates has stalled activity. I'm not confident in any of these names for 2023 despite multiples that appear cheap as estimates will keep moving lower. **Pulte (PHM)** is the preferred name if forced to pick one among the larger cap plays while **Skyline Champion (SKY)** an attractive small cap name. **Tri Pointe (TPH)** is another small cap where forecasts currently suggest durable growth enduring.

Building & Construction – Engineering & Consulting

Components: PWR, J, ACM, TTEK, EME, MTZ, STN, FLR, APG, DY, AMRC, NVEE, ROAD, MYRG, GVA, PRIM, STRL, IESC, AGX, GLDD, TPC, NOA, WLDN, MTRX

International & Private Peers: VINCI, Actividades de Construcción y Servicios, Bechtel, Bouygues, Power China, Skansa, Technip FMC, Balfour Beatty

Intro

The modernization and hardening of America's aging utility infrastructure, the transition toward renewable power generation (primarily solar and wind), and the nationwide build-out of optical fiber and 5G telecommunications infrastructure are supportive long-term secular growth drivers for many of these companies.

Industry Backdrop & Investment Considerations

Macro factors influencing this group include Population Growth, Utility Reliability & Safety, Tech Innovation, Energy Efficiency and Aging Infrastructure.

One key growing market is Renewable Energy for new projects. Energy Efficiency is a $30B market showing steady growth while distributed energy generation, storage and microgrids a $100B market with sizable growth. The expansion of wind and solar generation capacity in the US is among the most significant long-term trends tied to the energy transition.

The growing demand for data and bandwidth has created an opportunity in Telecom with companies deploying fiber-to-the-home, fiber-to-the-node, and fiber-to-the-building technologies to enable 1 gigabit connections while 5G deployment is in the early innings. The companies focused on environmental solutions are best positioned for future growth.

Utility grid modernization and hardening is the primary driver of growth over the next several years and beyond for transmission & distribution exposure like **MTZ** and **PWR**. Much of the US electric grid is aging and in need of maintenance or full replacement, helping drive consistent y/y increases in utility capital spending related to transmission and distribution.

Indicators, Metrics & Stock Selection Framework

EBITDA Margins, ROIC, EV/EBITDA, EBITDA CAGR, FCF Yield, Debt/EBITDA

Valuation & Comps

EV/EBITDA to EBITDA Margins

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change
E&C					#VALUE!		#VALUE!		#VALUE!	#VALUE!
PWR	Quanta Services Inc	21.8B	15.58X	9.54%	7.33%	10.48%	2.69%	9.72%	0.48%	4.15%
J	Jacobs Solutions Inc	15.5B	12.64X	10.7%	-0.17%	9.02%	6.98%		4.54%	5.14%
ACM	Aecom	11.8B	13.56X	9.79%	5.09%	7.03%	4.82%	13.7%	7.02%	-0.87%
TTEK	Tetra Tech, Inc.	8.2B	20.94X	8.43%	5.62%	13.76%	3.08%	15.58%	2.81%	2.00%
EME	Emcor Group Inc	7.2B	11.02X	5.28%	6.76%	6.28%	3.89%	22.78%	1.51%	4.64%
MTZ	MasTec Inc	7.0B	11.78X	12.67%	33.53%	9.77%	3.00%	11.71%	-42.67%	-2.37%
STN	Stantec Inc. (USA)	5.5B		5.97%	7.10%	16.66%	#VALUE!	5.88%	0.67%	2.33%
FLR	Fluor Corp	5.0B	10.20X	22.68%	8.94%	0.72%	#VALUE!	110.15%	-30.49%	2.66%
APG	APi Group Corp	4.5B	11.83X	9.8%	3.37%	10.72%	#VALUE!	14.93%	-2.11%	0.74%
AMRC	Ameresco Inc	3.3B	19.41X	28.25%	-16.33%	13.11%	#VALUE!	8.24%	0.00%	0.14%
DY	Dycom Industries Inc	2.6B	10.04X	24.66%	7.52%	10.99%	0.76%	3.51%	183.71%	20.37%
NVEE	NV5 Global Inc	2.2B	15.49X	3.27%	5.75%	17.66%	#VALUE!	11.13%	3.31%	3.54%
GVA	Granite Construction Inc.	1.6B	6.92X	22.05%	7.73%	9.61%	#VALUE!	(3.295%)	-2.89%	3.19%
MYRG	MYR Group Inc	1.5B	9.71X	14.84%	5.63%	4.97%	6.77%	19.37%	-10.44%	4.87%
ROAD	Construction Partners Inc	1.4B	11.91X	15.19%	8.12%	9.13%	1.47%	3.13%	-17.57%	31.80%
PRIM	Primoris Services Corp	1.1B	7.79X	9.94%	18.75%	8.48%	#VALUE!	9.53%	6.79%	18.27%
STRL	Sterling Infrastructure Inc	1.0B	6.25X	8.84%	2.87%	10.81%	#VALUE!		12.58%	3.27%

Management Commentary

Quanta (PWR) on record results…. "Demand for our services continues to be driven by broad-based business strength from utility grid modernization and system hardening initiatives, as well as our reputation for solid and safe execution. Overall, our electric power outlook remains strong, driven primarily by increasing service line opportunities and market share gains for our base business. Our Renewable Infrastructure Solutions segment performed well overall during the third quarter, led by solid performance on high voltage transmission, substation and interconnection work. Furthermore, this past August, the Inflation Reduction Act, or IRA, was signed into law. It includes nearly $400 billion of tax incentives and financial support designed to accelerate the country's energy transition to a low-carbon economy. This legislation is considered by many to be the nation's most ambitious legislative action ever taken on climate, which we believe should have a meaningful positive effect on a number of our end markets for at least the next decade."

Jacobs (J) on EV and Green Energy…. "Jacobs remains uniquely positioned across the entire electric vehicle ecosystem to address all aspects of this rapidly expanding market from manufacturing capacity to EV charging infrastructure to advanced mobility implementation. With favorable tailwinds and expanding list of automobile and EV manufacturing clients are seeking Jacobs' leading support to develop sustainable production capacity. Moving to climate response. Global demand for affordable green energy led to an increase of over 33% in bookings with wins across multiple geographies, including the U.K.'s National Grid, U.S. Department of Energy, Elenergy in Korea where we're developing a new green hydrogen production and import facility. In the U.S., IIJA supported pipeline is building momentum and projects are moving through the sales cycle into delivery."

Aecom (ACM) on secular growth drivers…. "As we look ahead, 3 secular growth drivers are accelerating across our markets. The first secular growth driver is the global infrastructure investment renaissance, which is driving synchronized funding growth across a number of our largest markets. In the U.S., multiple bills have been signed into law to fund infrastructure investment, creating many years of funding visibility. This includes the IIJA, where, as I noted, funding has not materialized as quickly as expected. However, this funding is committed, and we expect these short-term impacts to resolve and create strong multiyear tailwinds. The second secular growth driver is demand for sustainable, resilient infrastructure and investments in energy transition. Finally, our clients are accelerating investments to adapt assets and supply chains to a post-COVID new normal. The U.S., for instance, is prioritizing the reshoring of critical manufacturing capabilities, while Europe and many parts of the world are advancing energy transition priorities. It bears repeating that we are ranked at or near the top of every high-value market that is critical to delivering these secular growth drivers. We are #1 in transportation design, facilities design, green design, environmental engineering and holds several leadership positions in the water sector."

OptionsHawk Executive Summary & Focus Stocks

Quanta (PWR) is the largest, and best, name in this group with a combination of strong growth and margins positioned well for multiple positive infrastructure trends. **Tetra Tech (TTEK)** is the other favorite, and margin leader though comes at pricey valuation. **MasTec (MTZ)** is an attractive name at 11.8X EBITDA with the strongest growth while **Fluor (FLR)** is an intriguing turnaround story seeing record bookings. **Dycom (DY)** another small name back to 10X EBITDA is looking attractive. **Primoris (PRIM)** is another small name that screens attractive. Overall there appears to be several quality winners in this group that looks well positioned for all the infrastructure investment dollars.

<u>Home Services – Service Providers</u>

Components: ROL, POOL, ADT, FSV, FTDR, BV, SWIM

International & Private Peers: Rentokil, Anticimex

Intro

The Pool industry is facing downward pressure with the housing market and following the surge in new pool builds during the pandemic, but a lot of the business based on repair and services remains well positioned due to the much larger installed base while positive shifts in moves to warmer weather continue to be a trend. In Security, ADT is looking to grow via new partnerships with Google and State Farm. Property Servicers face uncertainty with the housing environment and slowing repair/remodel markets but continue to operate in a highly fragmented industry.

Industry Backdrop & Investment Considerations

The US Pool Industry has a total retail addressable market of $20B in 2020 with growth driven by secular shifts including increased consumer spend on outdoor living, home price appreciation, and migration towards warmer Southern and Western states. The industry tends to be divided into New Pool Construction ($4.2B), Repair/Remodel ($4.6B), Retail & Accessories ($9.4B) and Services ($1.5B). The wholesale channel accounts for approximately 70% of industry sales, as they serve contractors and specialty retailers.

The irrigation and landscape industry shares many characteristics with the pool industry as system installations often occur in tandem with new single-family home construction making it more susceptible to economic variables that drive new home sales. The landscape industry offers similar maintenance-related growth opportunities as the swimming pool industry.

The residential and commercial pest control industry is estimated near $20B and seen rising to $30B in 2027 with a 5.2% CAGR. ADT's significant scale gives it a leading position in the $27B security monitoring and services industry.

Property Managers provide services such as facility maintenance, concierge & front desk, pool & amenity management, energy management, developing/consulting and more. The majority of these industries are highly fragmented. The Property Restoration market is estimated at $60B, House Painting a $50B market, Custom Closets at $6B, Home Inspection $3B, Flooring Installation a $65B market, and Fire Protection at $8B (all based on US market sizes). Landscaping is a $70B highly fragmented industry with BV the top player with just a 2.3% market share. FTDR is the leading US provider of home service plans ($2.4B), which provide homeowners with budget protection and convenience for the repair or replacement of home appliances or systems (e.g., plumbing, HVAC, electrical).

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, FCF Yield, Debt to EBITDA, CapEx/Sales

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Service Providers					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
ROL	Rollins, Inc.	18.9B	32.53X	11.24%	7.30%	23.02%	#VALUE!	11.65%	-2.28%	11.81%	0.01X
POOL	Pool Corporation	13.1B	13.30X	4.74%	-1.94%	17.19%	5.93%	32.56%	7.20%	-0.06%	1.34X
ADT	ADT Inc	9.0B	7.74X	7.91%	7.64%	38.65%	#VALUE!	(2.435%)	-20.77%	0.71%	3.94X
FSV	FirstService Corp	5.5B		5.92%	7.51%	9.94%	#VALUE!	14.53%	-9.46%	14.36%	1.40X
FTDR	Frontdoor Inc	1.9B	11.72X	23.78%	4.40%	16.32%	#VALUE!	47.21%	-41.71%	-3.47%	1.13X
BV	Brightview Holdings Inc	0.6B	6.53X	7.33%	3.72%	12.62%	10.19%	4.06%	-47.83%	6.23%	3.62X
SWIM	Latham Group Inc	0.4B	4.47X	27.93%	-14.42%	22.31%	3.48%	(7.368%)	-42.22%	-20.00%	1.69X

Management Commentary

Rollins (ROL) on its business model and industry….“A couple of statistics I'll start with here today, just under $3 billion of annual revenues, a very strong margin profile north of 20% on the EBITDA line. But two things that really are part of that consistency story. One is recurring revenue. 80% of our business, roughly 80% of our business is under some form of a contract. So each day when we wake up and we go out there, roughly 80% of our business is under contract. It's a great position. When we think about the market we compete in, it's about a $20 billion total addressable market growing at a mid-single-digit clip. And we look at the market through the lens of three broad services: One is residential; second is commercial; and the third is the termite business. We've got strong brands. Many of you probably are well aware of the Orkin brand. And the pipeline, as I said, is full and I'll tell you, you look at the industry, there's 20,000 competitors in the U.S. alone. And so there's a really highly fragmented market for us to continue to deploy the cash flow that we've generated in the business.”

Pool Corp (POOL) on the changed industry…. “The industry has transformed as well and is now larger driven by, one, a higher installed base, which is approximately 6% larger when compared to the 2019 installed base of in-ground swimming pools; and two, structural inflation that has increased the size of the industry by approximately 30%. Pool owners continue to upgrade their equipment pads with new technology as normal repairs are needed and replacements are made. Consider the average age of a pool in North America is around 25 years old with about half of those pools operating with little to no automation or modern features. Clearly, the jump in new pool construction activity in 2020 and 2021 helped drive our growth. At the same time, however, the nondiscretionary maintenance and increasing content on the replacement items as well as the structural inflation on the growing installed base have allowed us to grow this year despite the fact that new pool construction activity may be down from the previous year by as much as 15%. Our industry is somewhat unique given the high recurring revenue nature of the business. We also enjoy a market-leading position, expanding capabilities and an unmatched track record. While no one is certain about what challenges we will face in the future, we can be certain that we will rise to the occasion. Our mix of business is most heavily weighted on nondiscretionary spending, and we provide best-in-class service and value for our customers."

OptionsHawk Executive Summary & Focus Stocks

Pool (POOL) a long-term winner that is now in a very tough forward set-up but the installed base will result in an eventual buying opportunity. At 13X EBITDA it is about as cheap as it has been in a decade, so it falls into the value buy category for a 3–5-year outlook. **Rollins (ROL)** is the best business but trades at a wild 32.5X EBITDA. **FirstService (FSV)** is a stable grower in a fragmented industry, but I have trouble getting past the low-margin business. **ADT (ADT)** is an interesting name seeing growth and very high margins with it developing some key relationships, a $9B market cap with plenty of debt but I can see it being an acquisition target.

Home Services – Waste & Environment

Components: WM, RSG, WCN, GFL, CLH, AQUA, SRCL, CWST, PCT, MEG, HCCI, HSC, BW

International & Private Peers: Remondis AG, Suez Environmental, Veolia Environment, Biffa, Recology, Cleanaway Waste Mgmt., Renewi

Intro

Waste Management stocks have performed well in 2022 as expected with correlations to inflationary environments as well as being a beneficiary of infrastructure stimulus. The group will face a much tougher environment in 2023 as inflation rolls over and headwinds from recycled commodities but momentum in solid waste continues and defensiveness and domestic focus remain positive attributes. While recycled commodities are a small portion of sales, it is a high flow-through to EBITDA and takes the shine off headline margin expansion. Waste typically struggles in cyclical rotations when PMIs bottom and macro risks abate if that scenario starts to show in 2023.

The Environmental Services industry is in the early stages of driving structural margin improvement, with the top two players in the average market now holding 90% market share on average, and the pace of local market concentration rising at ~1% over the past year.

Industry Backdrop & Investment Considerations

The waste management business correlates tightly to the housing market but is less volatile as the ability to raise prices has often offset volume headwinds. Positives for the waste management industry include CPI rising, infrastructure stimulus, tax reform, and recyclable commodity prices. The potential for an increase in tax under the new administration is a negative for this group. Waste Management is a defensive group.

Residential volumes (~27% of collection sales) for the industry are tied to US population - (extremely) slow and steady grower over time. However, the industrial and commercial verticals are more cyclical, showing a strong coincident relationship with industrial production. The waste industry's modest cyclicality is driven by industrial activity, as homes and municipalities generally don't shutter during recessions, but businesses do.

Economic growth is the largest driver of commercial and industrial volumes within the waste industry. Economic growth creates more waste (e.g. more construction, more shopping, more eating out etc.), which can result in more tons at the landfill, more weight at a temporary roll off dumpster driven by construction and housing starts, and higher service level requests within commercial

Several megatrends fuel the demand for efficient waste management. They include population growth, rising living standards, public health, industrialization and urbanization in emerging markets, and the tendency toward shorter product life cycles of electronic devices. The waste sector is a $2 trillion market. The World Bank sees municipal solid waste volumes rising by a factor of 2X by 2050. The industrial waste sector comprises several end-markets, including manufacturing, chemical, textile, and construction. The industrial waste sector also includes wastewater and hazardous-waste end-markets.

The industry has consistently consolidated over the last 15 years driving stronger pricing power with the top two players holding an average of 77% landfill market share at the local level. Expect inflationary pressures to continue to drive an acceleration in pricing in 2022 as well, with indexed contracts that tend to reset at the prior year's CPI. The group is seeing pricing accelerating ahead of expectations and commercial and industrial volumes still recovering to pre-pandemic levels. The top four solid waste players now account for 56% of US landfill industry volumes compared to 38% in 2008, with a similar improvement in collection market share (45% today). M&A value in this industry is beyond pricing, with tangible opportunities for shared operating efficiencies. To move trash 50 miles by truck costs over $10 per ton compared to a realized landfill price of ~$30 nationwide. As a result, local market structure is key.

Indicators, Metrics & Stock Selection Framework

EBITDA per employee has grown 34% over the past 13 years driven by a combination of a pricing inflection, cost improvement, and steady consolidation. As a result, every ton of trash is 20-25% more profitable for public companies today than in 2008. Unit profitability is the central fundamental driver of stock performance for the Environmental Services because overall waste volume growth and variability are low, driving (i) a predictable cash flow stream and (ii) value creation opportunities for companies that are able to improve their per unit profitability or maintain a high level of productivity while integrating acquisitions.

EBITDA/Employee, EV/EBITDA, EBITDA Margin, FCF/EBITDA (FCF Conversion), Debt to EBITDA, FCF Yield

Valuation & Comps

Historically, the waste sector has traded at a 45% P/E premium to the market, largely given the resiliency of its earnings stream.

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Waste & Environmental					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
WM	Waste Management, Inc.	68.4B	14.85X	7.17%	5.53%	28.47%	2.99%	5.23%	6.41%	3.82%	2.36X
RSG	Republic Services, Inc.	43.1B	13.94X	6.61%	8.30%	29.22%	3.46%	4.28%	3.90%	9.98%	2.77X
WCN	Waste Connections Inc (USA)	36.0B	19.02X	9.43%	10.61%	31.28%	2.70%	5.48%	1.60%	4.33%	2.44X
GFL	GFL Environmental Inc	9.9B	13.38X	8.41%	11.83%	25.85%	6.20%	1.06%	-14.39%	12.72%	4.87X
CLH	Clean Harbors Inc	6.5B	8.38X	4.74%	2.10%	22.64%	3.72%	6.52%	69.16%	14.10%	1.67X
AQUA	Evoqua Water Technologies Corp	5.3B	18.78X	7.38%	4.48%	18.46%	2.61%	9.1%	5.56%	9.69%	2.13X
SRCL	Stericycle Inc	4.8B	14.69X	13.5%	2.94%	17.28%	2.51%	4.97%	-3.93%	0.35%	3.43X
CWST	Casella Waste Systems Inc.	4.4B	20.12X	11.24%	7.47%	25.41%	2.07%	5.48%	13.00%	9.31%	1.80X
MEG	Montrose Environmental Group Inc	1.4B	23.13X	16.89%	7.34%	13.12%	#VALUE!	(5.407%)	-852.78%	0.67%	1.15X
PCT	Purecycle Technologies Inc	1.0B	-14.34X		#VALUE!		-43.37%	(23.706%)	22.44%	#VALUE!	0.61X
HCCI	Heritage-Crystal Clean, Inc.	0.8B	5.76X	3.26%	10.73%	24.44%	211.32%	22.49%	55.74%	27.00%	0.00X
HSC	Harsco Corp	0.5B	8.41X	13.09%	0.96%	14.44%	18.28%	4.35%	-93.04%	0.19%	4.42X
BW	Babcock & Wilcox Enterprises Inc	0.5B	10.86X	17.1%	10.51%	74.09%	-13.40%		-216.07%	-1.03%	0.48X

Management Commentary

Waste Mgmt. (WM) on improving margins…. “An important contributor to our improving trend in operating expenses and overall cost structure is the strategic decision to leverage, through automation, the tight labor market and high attrition. Continuing on this discussion of our 2023 and beyond strategy, we're very pleased with our investments we're making in both renewable natural gas and recycling businesses. On RNG, we continue to make great progress on building out our new plants as we expect 2023 to be the heaviest capital investment year. We're on track to see meaningful earnings contributions from 2022 and 2023 investments in 2024, with full incremental operating EBITDA contributions coming in 2026, which are conservatively estimated at $400 million. Our 5 fully automated MRFs are now delivering differentiated results relative to our single stream network, with about 30% lower labor costs, 13% lower total operating costs, nearly double the operating EBITDA margin and most importantly, a 40% improvement in key safety metrics.”

Waste Connection (WCN) on forward visibility…. “We continue to have visibility for double-digit revenue and adjusted free cash flow growth in 2023, led by continued elevated solid waste pricing levels, plus over 4% from acquisitions signed or closed thus far this year with the potential for that amount to grow to more than 5% by early next year based on our current acquisition pipeline. Moreover, we expect above-average underlying margin expansion to overcome headwinds from recent decrease in recycled commodity values. And to the extent that we see any improvement in recycled commodity values or easing of inflationary pressures during the year, those impacts, along with additional acquisitions completed throughout the upcoming year will provide upside to these preliminary thoughts. We look forward to having better visibility on the tone of the economy, the pace of acquisitions and expected commodity-driven activity when we provide our formal outlook in February.”

Clean Harbors (CLH) on demand trends…. “Another key takeaway from Q3 is the unprecedented demand we saw for our network of disposal assets across many verticals, particularly chemical and general manufacturing. We are benefiting from strong tailwinds as U.S. manufacturing continues to generate record levels of waste and stricter regulations in retail and other markets are generating higher volumes for our facilities. Safety-Kleen Environmental grew 23% in Q3, as the team continues to drive healthy demand for its core service offerings. We continue to believe that our key markets are in great shape, based on a number of favorable domestic trends, reassuring initiatives, the U.S. infrastructure bill, new environmental regulations, such as PFAS and plans among high-tech manufacturers to significantly expand production of semiconductors, EV batteries and other products. With Environmental Service, we continue to maintain a record backlog of waste and healthy demand for our network of scarce disposal and recycling assets. We anticipate a strong finish to 2022 through a combination of base business and project work. All our service businesses are entering the final quarter of the year on a positive trajectory.”

OptionsHawk Executive Summary & Focus Stocks

The set-up for waste stocks is likely not as favorable in 2023 though they remain very strong and durable businesses trading at acceptable valuation multiples. **Republic Services (RSG)** screens as the best name looking forward and trades < 14X EBITDA with a better FCF yield and EBITDA margin than WM. **Clean Harbor (CLH)** valuation is cheap near 8X EBITDA. **Casella (CWST)** is an annual favorite small cap and remains an extremely attractive business though at a bit of premium 20X multiple. **Evoqua (AQUA)** is another steady grower but appears very rich on valuation. **Heritage-Crystal (HCCI)** is a tiny name that screens well annually and looks wildly cheap at 5.75X with no debt. HCCI would make a lot of sense as an acquisition target in the wastewater treatment space at this valuation and with strong margins.

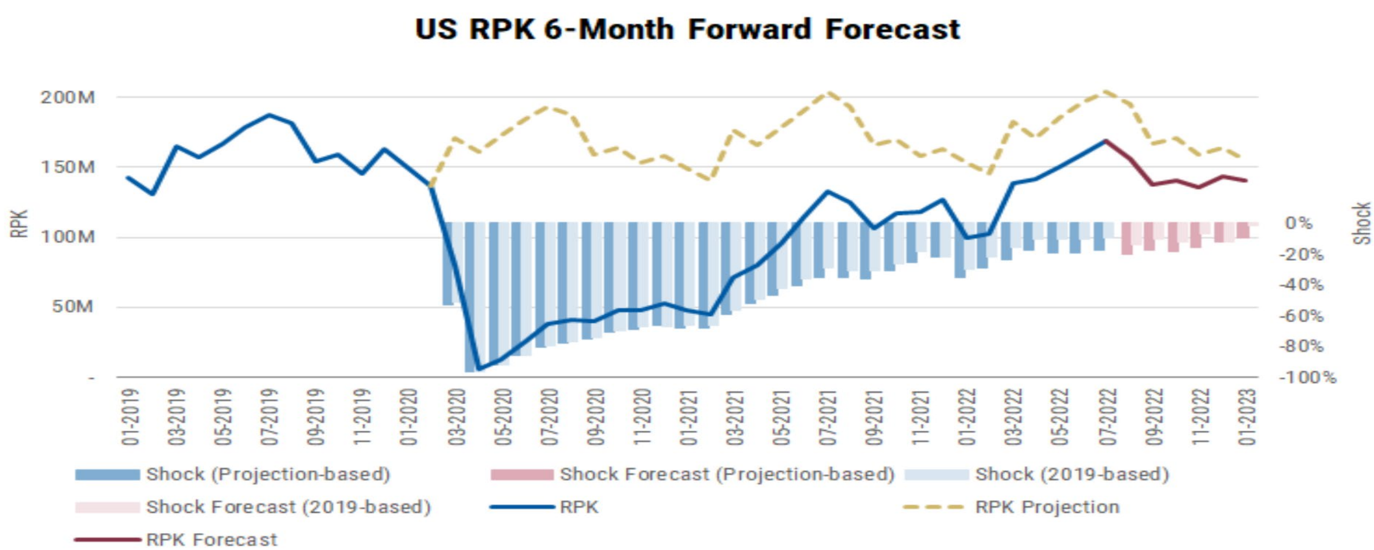
Transports – Airlines

Components: LUV, DAL, UAL, RYAAY, AAL, GOL, ALK, CPA, ULCC, JBLU, SAVE, ALGT, SNCY, AZUL, VLRS, SKYW, HA, UP

International & Private Peers: Emirates, China Southern, China Eastern, Air China, Lufthansa, All Nippon, Turkish Air, Air France, British Air, EasyJet, Qatar Air, Saudi Air, Aer Lingus, Norwegian Air

Intro

Airliners will be hosting Investor Days throughout the month of December with cost and customer demographics in focus. Travel has been strong through 2022 as the post-pandemic resurgence continues and although the consensus is "stronger for longer" there are concerns regarding growth sustainability as comps toughen. Capacity, plane delivery challenges, labor availability, pilot training and leisure strength are all key considerations. A stronger recovery in corporate travel in 2023 is a potential source of upside for the group as well as international travel growth.



Industry Backdrop & Investment Considerations

Capacity metrics like available seats miles (ASM) are often analyzed in order to get a sense of seat supply and its implications on pricing. Capacity is multiplied by a utilization metric (load factor) to arrive at revenue passenger miles (RPM), a metric for the number of passenger miles that generate revenue. RPM is multiplied by a yield metric (passenger yield) to arrive at total revenue for passengers. A similar calculation is often done for the cargo revenue as well. The addition of both passenger and cargo revenue leads to total revenue.

Several expenses are subtracted from the revenue. Labor, fuel, airport landing fees and maintenance costs are all important expenses for an airline. CASM-Ex captures all costs excluding fuel on a per available seat mile basis.

Airlines are generally modeled on a per available seat mile (ASM) or kilometer (ASK) basis in order to analyze the unit economics of each business. Revenue is often looked at on a revenue per available seat mile basis (RASM) or passenger revenue per available seat mile (PRASM) basis.

The group has often traded at a steep discount to other Industrials despite much stronger ROE, ROIC, Margins, and FCF/Share while having a strong economic moat protecting it from much new competition. Margins have recovered since the early 2000's as the group as consolidated and added on ancillary fees when traveling, yet sentiment across the group from investors remains fairly negative especially after the pandemic hurt the group badly as travel plummeted and longer term impacts of work-from-home hit the more profitable business travel segment hard.

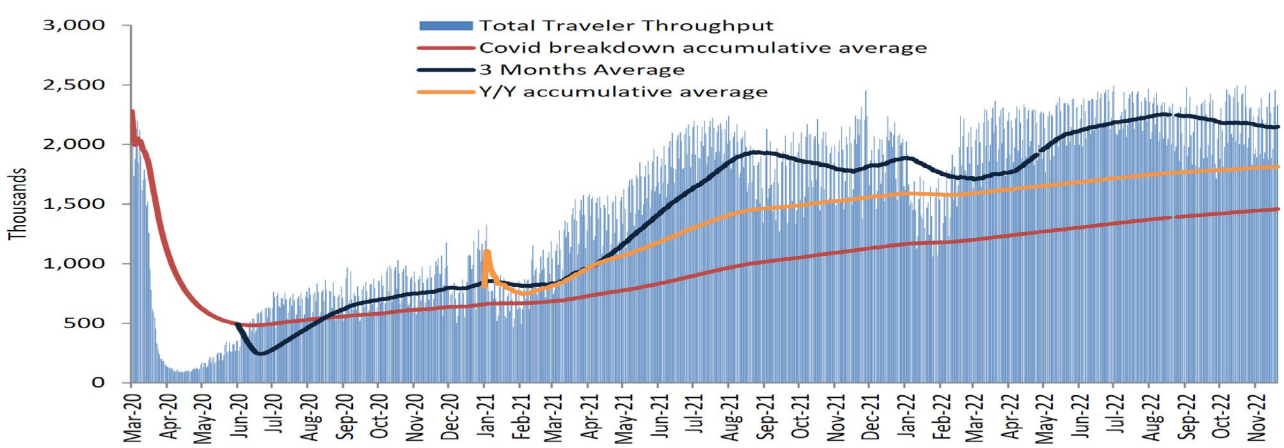
Some long-term structural themes that are likely to influence US Airlines include emissions regulations, ESG principles and competition from next-generation aviation technologies including UAVs (urban air vehicles or passenger drones) for short haul flights and hypersonic aircraft for long-haul flights. There is no strong correlation between Airline valuation and the most important fundamental drivers of earnings. This runs counter to the common perception that airline stocks largely trade solely on jet fuel prices or ASM or PRASM. This means that while a rising or falling industry tide will lift or sink all boats, idiosyncratic catalysts will separate beneficiaries from the challenged players. When the market is risk on, the lower quality stories will likely outperform but when the market is risk off, quality/defense will be preferred.

Indicators, Metrics & Stock Selection Framework

EV/EBITDAR, Debt to EBITDA, EBITDA Margins, EBITDA Growth

The airline group has many of its own metrics that it reports monthly such as Passenger Revenue per Available Seat Mile (PRASM), Revenue Passenger Miles (RPM), Average Seat Mile (ASM), Cost per Available Seat Mile (CASM), and Load Factor.

TSA Checkpoint Passengers Numbers



Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Airlines					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
LUV	Southwest Airlines Co	22.4B	5.05X	17.72%	11.28%	12.22%	-0.82%	(15.126%)	105.70%	12.76%	-1.79X
DAL	Delta Air Lines, Inc.	21.4B	6.53X	19.32%	12.14%	14.53%	-2.15%	(11.481%)	98.62%	4.57%	1.78X
RYAAY	Ryanair Holdings plc (ADR)	15.8B	6.80X	(0.478%)	19.22%	17.14%	1366.34%	(3.132%)	-436.25%	117.21%	0.53X
UAL	United Airlines Holdings Inc	13.5B	5.40X	20.16%	12.79%	16.65%	-6.54%	(21.246%)	-194.42%	10.55%	1.48X
AAL	American Airlines Group Inc	8.7B	10.33X	20.84%	4.51%	11.45%	16.94%	(19.293%)	-94.07%	14.02%	4.08X
ALK	Alaska Air Group, Inc.	5.7B	4.38X	11.65%	5.84%	19.17%	-7.53%	(4.662%)	32.54%	6.93%	-0.48X
CPA	Copa Holdings, S.A.	3.7B	6.96X	20.49%	18.14%	26.25%	#VALUE!	0.11%	-1195.30%	100.94%	0.87X
ULCC	Frontier Group Holdings Inc	2.7B	128.80X	39.61%	23.79%	8.39%	-7.49%	(195.425%)	-140.00%	8.32%	-1.06X
JBLU	JetBlue Airways Corporation	2.3B	8.66X	25.83%	7.75%	11.67%	-844.96%	(12.519%)	7830.00%	4.56%	1.26X
SAVE	Spirit Airlines Incorporated	2.2B	15.79X	27.67%	20.92%	6.67%	#VALUE!	(11.188%)	110.47%	7.63%	5.16X
ALGT	Allegiant Travel Company	1.3B	7.88X	39.68%	10.51%	11.36%	-29.29%	1.46%	-87.72%	3.79%	3.42X
SNCY	Sun Country Airlines Holdings Inc	1.1B	11.69X	32.94%	17.02%	14.75%	-4.96%		-61.90%	-0.77%	2.61X
VLRS	Controladora Vuela Co Avcn SA CV (ADR)	1.2B	6.61X	21.82%	11.39%	18.54%	#VALUE!	4.67%	-125.50%	33.18%	3.71X
SKYW	SkyWest, Inc.	0.9B		134.6%	-2.78%	21.92%	#VALUE!	3.43%	-25.83%	17.76%	3.41X
AZUL	Azul SA (ADR)	0.9B	42.92X	25.73%	18.49%	21.14%	#VALUE!	(136.565%)	-75.40%	67.72%	5.93X
HA	Hawaiian Holdings, Inc.	0.6B	-16.92X	56.74%	16.53%	6.46%	-6.82%	(22.838%)	18.06%	2.05%	1.34X
GOL	Gol Linhas Aereas Inteligentes SA (ADR)	4.5B	100.62X	30.23%	25.19%	11.82%	#VALUE!		59.04%	9.98%	11.84X
UP	Wheels Up Experience Inc	0.3B	0.14X	(80.713%)	9.06%	(10.76%)	-87.74%	(153.903%)	23.47%	38.64%	1.97X

Management Commentary

Southwest Air (LUV) on trends and 2023 focus…. “We are coming off of a record third quarter revenues and bookings appear strong as far as we can see in our booking curve. Demand trends, both volumes and yields, are robust. Going forward, we believe we have capacity better matched seasonally to demand in the fourth quarter, and you can see the benefit in our sequential revenue improvement from 3Q to 4Q based on our guidance. Jet fuel prices remain high, but we are 61% hedged in the fourth quarter and continue to expect healthy hedging gains. We continue to expect both inflationary cost pressures and cost headwinds from lower productivity and efficiency in fourth quarter. Specific areas of focus for 2023 are to maintain adequate staffing and get caught up in pilot staffing, get new contracts with all labor groups, currently in negotiations, fully utilize our aircraft and optimize staffing to the fleet and flight activity, bring out cost inefficiencies and improve efficiency levels and operating leverage as we fully restore the network. Our primary gating factor to growth next year continues to be pilot hiring, and I don't expect that we will be fully utilizing the fleet until late 2023. As of today, our flight schedules are published through July 10, 2023, and we feel good about our ability to fly those schedules as published and planned despite some uncertainty around aircraft deliveries. While we expect a healthy amount of capacity growth next year, it is nearly all going back into key Southwest markets. These are markets that we borrowed from to fund new airport expansion during the pandemic. And as business demand improves, we have opportunities to build those back up. And this is lower-risk growth primarily in markets where we have the #1 share and a strong Southwest customer base, so we don't believe the capacity additions carry near the risk of adding a new market.”

Delta (DAL) on stage of air travel recovery…. “After 2 years of delaying travel, it is clear that consumers are getting out and traveling the world. Business travel continues to recover in line with our expectations as bookings have improved after Labor Day and companies reconnect with their teams and their customers. And while consumer spend on experiences is growing, the airline industry revenues are still $20 billion to $30 billion below the historical trend against GDP, highlighting the significant opportunity still ahead. Our priority over the next 6 months is to prepare for full network restoration by next summer, consistent with our original plan, but always conditioned on a continuing demand strength. This will support another meaningful step-up in profitability and cash flow next year as we stay on our path to earn over $7 of EPS and $4 billion of free cash in 2024. In closing, while we are mindful of macroeconomic headwinds, the travel industry is experiencing a countercyclical recovery. Global demand is continuing to ramp as consumers shift spend to experiences, businesses return to travel and international markets continue to reopen. Demand has not come close to being quenched by a hectic summer travel season. At the same time, industry supply is constrained by aircraft availability, regional pilot shortages, and hiring and training needs. With record high fuel prices and increasing cost of capital, the hurdle rate is rising for incremental capacity across an industry that's still restoring its financial condition post pandemic. Against this backdrop and coupled with meaningfully improved asset utilization, at Delta, we are uniquely positioned to grow our earnings and cash flow in 2023.”

United (UAL) in industry tailwinds…. “However, there are 3 industry tailwinds prevailing the COVID recovery for aviation and United that are currently overcoming those macro headwinds, and we believe will continue to do so in 2023. In increasing order of importance, first, aviation uniquely is still in the COVID recovery phase. Take 1 example. Japan just opened last week. And regardless of what you think demand for business travel will ultimately return to 100% or something less, it almost certainly is going higher from here. Second, there's been a permanent structural change in leisure demand because of the flexibility that hybrid work allows. With hybrid work every weekend could be a holiday weekend. That's why September, a normally off-peak month was the third strongest month in our history. People want to travel and have experiences and hybrid work environments untether them from the office and give them the newfound flexibility to travel far more often than before. I'll bet many of you listening today have taken an extra trip or 2 this year, because you can work remotely for a couple of those days. This is not pent-up demand. It's the new normal. And third, the strong demand environment is happening against the supply backdrop that currently has the industry, 10% to 15% smaller relative to GDP than it was in 2019, and with multiple constraints, pilot shortages, aircraft delivery shortages from both Boeing and Airbus, air traffic control saturation and airport infrastructure constraints around the world are all real and they are constraints that will take years to fully resolve. These 3 trends are why all airline revenues keep surprising to the upside, but they're also real and durable, which is why we're so optimistic about 2023 and the longer term despite the economic challenges."

OptionsHawk Executive Summary & Focus Stocks

The four large cap Airliners are all trading 5-7X EBITDA and **Delta (DAL)** is consistently the best operator in the group and recently raised its outlook so the preferred name to stick with when Airlines are in favor. **American Air (AAL)** looks to be the short of the group at 10X with the weakest margins. In the next market cap tier the companies are positioned for a couple of years of very strong top and bottom-line growth. **Copa (CPA)** as an international name screens as the best value for growth name while **Sun Country (SNCY)** remains a favorite US small cap Airline that could be an M&A target.

<u>Transports – Rails</u>

Components: UNP, CP, CNI, CSX, NSC, TRN

International & Private Peers: Deutsche Bahn, SNCF, Russian Rail, Indian Rail, Burlington Northern, East Japan Rail, Central Japan Rail, Rumo SA

Intro

Rail certainly is sensitive to a weakening Macro backdrop while the potential strike that was recently averted was much of the focus for the group lately. Rail service and volumes are inflecting. Volumes have been up 10 consecutive weeks after declining 37 of prior 43 weeks. Service performance has been improving, and is the most important driver of rail stocks, more so than rising rates, along with the rails ability to sustain pricing above inflation. Cost pressures remain a headwind with higher fuel and labor costs.

The Association of American Railroads noted rail activity leads to about $2 billion a day in economic output. Nearly 467,000 truck moves per day would be needed to move those goods, an unattainable level. Rails move 26% of total ton miles and 12% of tonnage in the US, including 75% of all finished autos, 20% of all grain moved, 19% of all chemical moves and 70% of all coal.

Industry Backdrop & Investment Considerations

Precision Rail continues to drive better efficiency across the group as a major theme. The industry has seen consolidation over the years starting with Berkshire Hathaway buying BNSF in 2009, Brookfield Infrastructure buying Genesee & Wyoming in 2019, and the recent deal for KC Southern.

Rail is a group with a lot of great public information via weekly and monthly carloads and the ability to see which end-markets are seeing stronger volumes and relating that to the related rail company. The main groups are Petro/Chemicals, Metals/Minerals, Ag, Coal, Grain & fertilizer, Automotive, and Intermodal. The leading railroads submit weekly results to trade groups (such as the American Association of Railroads), and composite data is released on a regular basis. Rail traffic is a valuable proxy for economic activity. Carload traffic correlates pretty well with economic activity, as do the number of railcars deployed or held in storage.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Growth, Debt to EBITDA

Operating Ratio is a key metric in this group which has seen a drastic improvement from PSR. Top-line growth is a fairly reliable indicator of underlying freight demand and of the railroad's ability to increase rates.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Rails					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
UNP	Union Pacific Corporation	134.0B	13.32X	4.59%	1.57%	50.41%	5.05%	8.78%	-0.73%	5.69%	2.39X
CP	Canadian Pacific Railway Ltd	74.3B		12.5%	33.99%	50.52%	#VALUE!	5.77%	-3.47%	1.70%	4.32X
CNI	Canadian National Railway (USA)	86.2B		5.34%	3.87%	52.45%	#VALUE!	7.56%	5.43%	9.76%	1.53X
CSX	CSX Corporation	68.8B	11.31X	3.53%	-1.09%	50.24%	5.70%	9.79%	5.56%	6.98%	1.98X
NSC	Norfolk Southern Corp	59.7B	12.07X	4.33%	0.07%	47.2%	4.62%	7.46%	0.07%	5.30%	2.19X
TRN	Trinity Industries Inc	2.5B	13.50X	(2.625%)	32.93%	32.8%	#VALUE!	(2.147%)	0.00%	-6.54%	

Management Commentary

Union Pacific (UNP) on volumes…. "Our industrial business is really strong. We've got a lot of good growth coming out of our metals and minerals business. That's up 16%. We've talked about some business development wins in that area on the metals side. So we're excited to see that growth there. On our energy and specialized business, it's up 5%. And then we're keeping an eye on our petrochem business. Our plastics and industrial chemicals business is down 2%. As you can imagine, we're starting to see a little bit of softness now in our forest products. And again, let's call that both lumber and the paper business, it's down around 15% so far year-over-year. So keeping an eye on that. On our premium business, so our intermodal business and our autos business, it's up 7%. And we're seeing the impact of restocking from finished vehicles. That's up significantly. Some of that is also driven by business development wins, but it's up around 26%. So strong wins there. Auto parts is a little bit flat. So a little bit of difference there. And then our intermodal volumes, up 5%. We've got some easy comps in our international intermodal, and I see us up very significantly. And then on our domestic intermodal, we're seeing some impacts from the parcel business."

CSX (CSX) on Auto…. "And then everybody knows about the auto network. We've got a lot of finished vehicles on the ground waiting to move. So we're really trying to play catch-up there. The whole industry is, quite frankly, I think there's well over 100,000 of finished vehicles sitting on the ground for the railroads to move. And so we're really focused on that, and we'll see some -- probably some opportunity to work through some holidays at some of these facilities as they're really focused on getting these vehicles out to the dealerships. On the flip side, the good news is, obviously, auto is a big, big component of our business that touches a lot of different industries that we serve, whether it's metals, plastics, all these industries that are out there today, and we see some pretty significant opportunity for further recovery there that will drive and probably help some of the over inventory levels that we have today as that industry starts to ramp up."

OptionsHawk Executive Summary & Focus Stocks

Following the deal for KC Southern (KSU) this is a very small group now with just a handful of stocks and have to consider a weak Macro. **Canadian Pacific (CP)** has, by far, the strongest outlook but is also embedded into its multiple. **Canadian National (CNI)** tends to screen as the healthiest name and its valuation is closer to the US rails while having better metrics, so the preferred Rail.

<u>Transports – Trucking Carriers</u>

Components: KNX, SNDR, WERN, MRTN, HTLD, ULH, PTSI

International & Private Peers

Intro

Trucking faces a weaker demand backdrop coupled with declines in pricing as the cycle turns off a peak. Carrier estimates imply a moderate 2H22, given a weaker peak season, and sets up for a soft 2023 start. BAML's Demand Indicator remains at freight recession levels, similar to 2012, 2015, and 2019, as demand outlook continues to decline under the backdrop of normalizing inventories and softer macro factors. The Inventory Indicator (shippers' view on their inventories) was 81.3, its third highest level ever, while the Capacity Indicator (shipper's views of available trucking capacity) was at 61.1, just below its 61.5 all-time high, suggesting that the loosening of truckload capacity continues. Operating costs per mile for truckload carriers have risen to $2.01/mile in September 2022, up 14% year-year from $1.77 a year ago, according to DAT Analytics. Rising diesel fuel prices ($5.22/gal, +46% y/y), higher wages, and costlier maintenance expense has continued to pressure owner-operators, impacting carrier profitability.

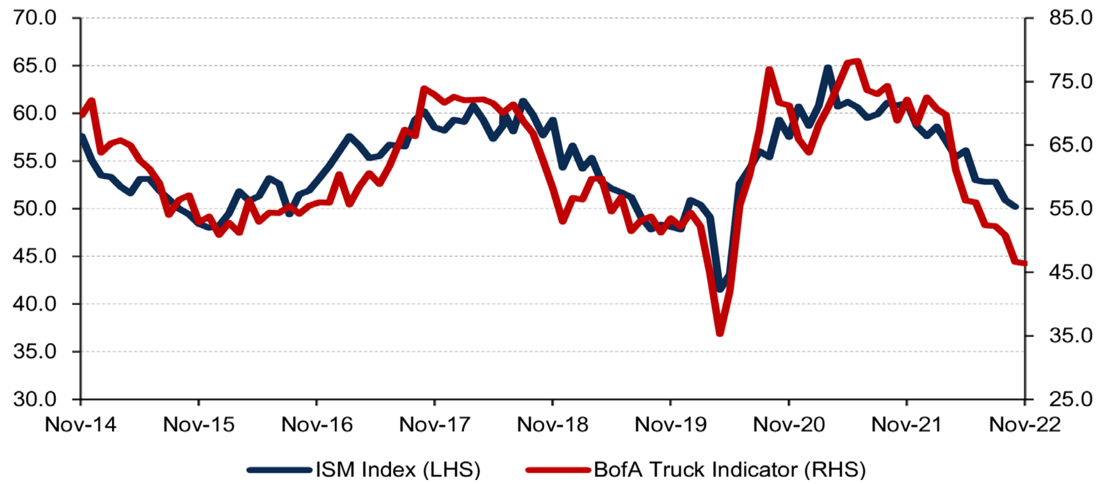
Industry Backdrop & Investment Considerations

The truckload industry is highly competitive and fragmented with thousands of carriers of varying sizes. The industry is highly competitive based primarily upon freight rates, qualified drivers, service, and equipment availability. The industry is highly cyclical. Increased regulations and initiatives to improve the safety and reduce emissions of the U.S. trucking industry have impacted industry dynamics in recent years. Most truckload contracts (other than dedicated contracts) do not guarantee truck availability or shipment volumes. Pricing is influenced by supply and demand.

The $343B for-hire trucking market remains highly fragmented as over 90% of trucking capacity is made of fleets with 5 trucks or less. No trucking company has more than 2% revenue market share. This can make truck capacity sourcing (to move freight) both time intensive and expensive for shippers. The trucking industry has been faced with a qualified driver shortage. Competition for qualified drivers will continue to be challenging going forward due to the decreasing numbers of qualified drivers in the industry.

Supply chain congestion, tight labor markets, underlying demand strength, and a backlog of new truck deliveries combined with the need to cover driver wage inflation continue to keep an upward bias on spot trucking rates.

Trucking is a group that has a ton of great free resources online to track monthly rates and volumes, Cass Freight Index and ATA Truck Tonnage two of the most widely followed. The Cass Freight Index, which measures the monthly aggregate deliveries of U.S. freight, provides insight into freight trends as they relate to the overall economy and other economic supply chain indicators. The index including all domestic freight modes (including trucks), is derived from ~$28B in freight transactions processed by Cass Information Systems, Inc. annually, and represents a broad sampling of industries, including automotive, chemical, consumer packaged goods, food, heavy equipment, OEM, and retail.



Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, EBITDA Growth, FCF Yield, ROIC, Operating Ratio

ROIC should become an increasingly important financial metric for the Trucking & Logistics industry as the industry matures and becomes more focused on returns.

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Trucking - Carriers					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
KNX	Knight-Swift Transportation Holdings Inc	9.0B	5.98X	8.33%	-4.32%	22.64%	8.87%	9.83%	-0.84%	5.35%	1.01X
SNDR	Schneider National Inc	4.5B	4.48X	7.07%	-2.07%	13.95%	7.51%	16.17%	2.64%	3.43%	-0.19X
WERN	Werner Enterprises, Inc.	2.8B	5.39X	8.9%	2.89%	18.11%	6.50%	13.27%	-5.55%	6.01%	0.70X
MRTN	Marten Transport Ltd	1.7B	6.33X		3.84%	19.15%	5.05%	5.34%	36.68%	13.60%	-0.28X
HTLD	Heartland Express, Inc.	1.3B	6.70X	5.24%	29.38%	25.8%	#VALUE!	5.66%	24.44%	53.32%	0.48X
ULH	Universal Logistics Holdings Inc	0.9B	4.08X	4.01%	-3.21%	16.68%	#VALUE!	8.88%	144.39%	18.54%	1.12X
PTSI	P.A.M. Transportation Services, Inc.	0.6B	3.99X		1.76%	20.5%	#VALUE!	18.85%	43.55%	38.60%	0.90X

Management Commentary

Schneider National (SNDR) on consumer trends,

“Solid contract demand, but not much of a seasonal peak or project work or those items, which is exactly what we expected, although we do believe this month between now and the middle of December is a much heavier focus around the food and beverage verticals as we get to the holiday period. So I think that will be a good tail sign of where we are with inventory levels and what's the consumer buying behavior. So a lot of what we do in the dedicated arena is fulfill the store. And so I think that there perhaps is a story there that would indicate that, that inventory is bled down is getting out, and we may not have we may be in the midst of the air pocket now and not what people are predicting for the first or second quarter of next year. So let's see how that plays out. And secondly, if we can just watch all the leading metrics in our brokerage business, the call volumes, the -- how long something stays on a board, what's the discussions? I mean it would certainly suggest that the small carrier is in a high level of distress, and we think we're on the front end of that displacement to include the revocations that you're seeing now starting to really spike and there's a little bit of a lag on that factor about a quarter.”

Knight Swift (KNX) on changing freight markets…. "We've been preparing for the next freight downturn since before the last one. he changing freight market, from the all-time high demand experienced, that started really in the summer of 2020 and continued into a more typical seasonal demand, which we started to see at the beginning of this year, and now, in some ways, we're seeing sub-seasonal demand as we come towards the end of 2022 and head into 2023, has been a little easier to anticipate, predict and even prepare for than what we originally saw back at the start of COVID-19. Now although we've been hoping that the strength would continue, over the last year, we have followed our playbook in preparing for the economy and the truckload market to slow. We reduced our exposure to the spot market at the beginning of the year and have made certain cost adjustments throughout the year. Mitigating the volatility associated with the full truckload market has long been a major focus for our company and something we frequently talk about with investors. A major part of the rationale for our entrance into the LTL market was the reduced volatility in the LTL market, which has considerably high barriers to entry and has performed with remarkable consistency over the last 2 decades. It used to be that the truckload carriers' only real option for mitigating cyclicality was to increase the percentage of their business that's dedicated as opposed to a regular route."

OptionsHawk Executive Summary & Focus Stocks

Trucking overall is a group I am looking for shorts with a name like **Werner (WERN)**. **Knight (KNX)** is the best operator here but a name to wait for the cycle bottom to consider owning. **Heartland (HTLD)** is a small trucker that screens very strong in this group with the best outlook for growth, strongest margins and positive revisions.

Transports – Trucking Intermodal & LTL

Components: ODFL, JBHT, TFII, SAIA, HUBG, ARCB

International & Private Peers

Intro

Although the U.S. ISM Manufacturing Index remains just above expansionary levels September's reading missed consensus expectations and marked the slowest rate of growth since the pandemic began; at the same time, new manufacturing orders contracted for the third time in four months and these trends are likely to weigh on the LTL names. LTL carriers may be more insulated given its Industrial focused mix but should still see tonnage declines. LTL yields should remain relatively stable given the heightened pricing discipline and more concentrated share mix.

Industry Backdrop & Investment Considerations

Strategic investments in warehouses, distribution systems and technology are starting to show benefits across the industry. Salaries, Wages & Benefits account for 44% of operating expenses in this group. The industry has seen multi-year improvements in the key metric operating ratio due to the strategic investments and scale.

Industrial Production has a strong correlation with truck tonnage, with an R^2 of 0.78. When the economy is strong and strengthening, truck tonnage and what is being shipped will likely also be strong. LTL stocks are trading at all-time-high multiples, a multitude of growth opportunities and the eventual recovery of the U.S. industrial economy provides a much longer cyclical runway for this segment, with a likely multi-year period of double-digit earnings growth.

High barriers to entry, continued network optimization and efficiency initiatives, improving service levels, and ample room for market share growth are attractive characteristics of the group. However, the eventual completion of inventory restocking tailwinds, the end of goods-only consumer spending, and the recent acceleration of Class 8 truck orders indicates that the market backdrop is presently as good as it gets, and that pricing may hit an inflection point soon and begin to ease.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, EBITDA Growth, FCF Yield, ROIC, Operating Ratio

Valuation & Comps

EV/EBITDA to EBITDA Margins

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Trucking - Intermodal, LTL											
ODFL	Old Dominion Freight Line Inc	33.7B	16.04X	8.16%	-1.02%	35.2%	2.67%	29.71%	10.04%	2.75%	-0.13X
JBHT	J B Hunt Transport Services Inc	19.1B	9.94X	5.15%	-0.23%	13.78%	2.09%	16.62%	11.66%	6.63%	0.55X
TFII	TFI International Inc	9.2B		11.77%	-7.86%	15.53%	#VALUE!	11.16%	23.42%	5.59%	1.32X
SAIA	Saia Inc	6.2B	9.56X	7.73%	-1.03%	23.17%	0.73%	23.33%	10.77%	4.55%	-0.16X
HUBG	Hub Group Inc	2.7B	4.56X	3.63%	-2.28%	11.6%	9.53%	12.42%	72.73%	8.15%	0.08X
ARCB	ArcBest Corp	1.9B	3.14X	8.18%	-3.50%	11.44%	14.91%	23.3%	30.35%	4.92%	-0.02X

Management Commentary

JB Hunt (JBHT) on Intermodal…. "The largest part of our company is going to be inside Intermodal from both profitability, but also value proposition to our customers. It is the most efficient land transportation in North America in total, and that's going to be one of the ways that we're going to be focused on saving money with our customers. There is a lot of freight moving on the highway with our customers that really can't find a more efficient way to move goods in total. I talked a little bit about Intermodal and the most efficient way in land transportation. But one of the areas that we're focused on not only in mode conversion off of Highway into Intermodal, but the other way is really in international shipments and being able to transload our customers really at the port of origin or near the port of origin, which I think is important. We are going to grow to 150,000 units over the next 3 to 5 years. It's really one of the biggest growth opportunities we have been presented, I would say, since the last Great Recession in Intermodal primarily because there'll be plenty of capacity on the BNSF. Then finally, on the highway side, this is where we leverage our technology. So J.B. Hunt 360, really bringing to the largest segment of the market that we serve for our customers, bringing the most efficient way to move goods, whether that's in a drop-and-hook scenario, so giving them capacity through a trailing fleet; or giving them a live load, live unload. That's where we are able to use nearly 1 million trucks to serve our customers. It is a growing part of our company."

TFI International (TFII) on inflationary pressures…. "So the driver shortage was pervasive in the industry. So we -- everyone, not just us, everyone, if you wanted a driver, you had to pay a signing bonus, you had to do a referral bonus, you had to pay a HR third-party company to go find drivers for you, and you had to pay them a bonus. We had to move drivers up the scale into top pay. So I would say the vast majority of the inflationary costs have hit us this year. And so a lot of those are going to subside. Like right now, people are paying -- sign us bonus, you're not having to pay a third-party service. I don't see that in 2023, and I see a normal type increase."

OptionsHawk Executive Summary & Focus Stocks

Old Dominion (ODFL) blows away every other trucking company as the best operator, but again want to wait for a better cycle to be a buyer as it works off peak pricing/revenues. **JB Hunt (JBHT)** may be an optimal way for short exposure to trucking. **Saia (SAIA)** annually screens as the best-in-class small cap in this group and it remains true.

Transports – Trucking Brokers & Logistics

Components: ZTO, EXPD, CHRW, UHAL, YMM, XPO, LSTR, R, GXO, RXO, FWRD, CVLG, RLGT, RXO

International & Private Peers

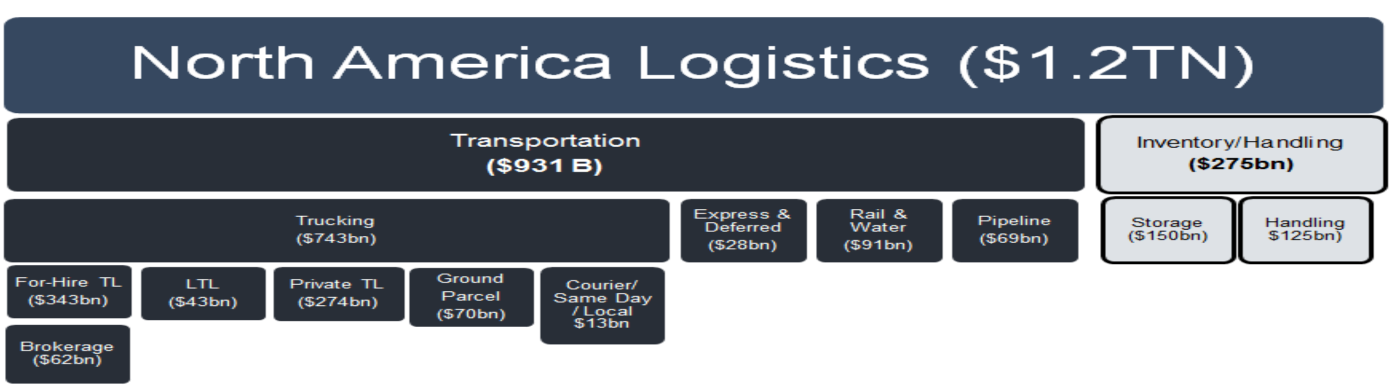
Intro

Softer consumer spending will weigh on the forwarding industry as will high inventories. Air and Ocean rates are seeing sharp declines as an unwind takes place. As contract rates get potentially renegotiated closer to the drop-off in the cost of transportation, margins across the brokerage space are likely to contract. Most truck brokers utilize a mix of annual contract/spot to drive gross revenues and source transportation in the spot market (purchased transport). This allows net revenues to expand when brokers lock in higher rates when rates are elevated and then expand margins as the spot market declines. The trucker brokerage sector looks good from secular perspective with outsourcing and periodic supply related issues amongst asset-based carriers helping to drive the brokerage space to GDP plus type growth rates.

The Truck Capacity Indicator, which measures shippers' views of available truckload capacity, was 75.4, down from 78.0 last survey, yet shippers view of available capacity remains historically high. The Rate Indicator, or shippers' views on truck rates, jumped to 34.1 from 22.0, up 55% sequentially (but down 56% year-year), as rate decline expectations moderate. The Inventory Indicator climbed to 62.7 from 58.3 last survey, its highest all-time level, as shippers' inventories remain elevated.

Industry Backdrop & Investment Considerations

The global logistics services industry is intensely competitive and is expected to remain so for the foreseeable future. There are many companies competing in one or more segments of the industry, but the number of firms with a global network that offer a full complement of logistics services is more limited. Certain ocean carriers are entering into traditional freight forwarding services as they pursue scale and additional market share to reduce operating costs and regain their financial footing. Further, there are new technology-based competitors entering the industry. The primary competitive factors in the global logistics services industry continue to be price and quality of service, including reliability, responsiveness, expertise, convenience and scope of operations.



The health of the transportation and logistics industries will continue to be a function of domestic and global economic growth. From a longer-term perspective, broker penetration looks to have increased from 7% to 22% of truckload (between 2000-2021), or at a 6% CAGR, with a penetration rate pegged at about 24% in 2022 as estimated by RXO. Note that CHRW - the largest truck broker - actually indicates a penetration rate in excess of RXO's data at 33% in 2022. The $400B for-hire trucking market remains highly fragmented as 86% of trucking capacity is made of fleets with 5 trucks or less. This can make truck capacity sourcing (to move freight) both time intensive and expensive for shippers. Brokers (a sub-segment of a Third Party Logistics or "3PLs") solve for this by managing carrier relationships on behalf of the shippers. Brokers work with shippers on both a contractual (generally annual) and spot basis (focused more on emergency/last minute loads).

The global forwarding business continues to benefit from elevated rates in ocean and air as overall industry demand remains high with limited vessel and container capacity. Capacity remains tight as demand significantly outweighs supply from labor and equipment shortages. The tight market in brokerage and overall trucking have led brokers to benefit from high spot rates and contract pricing.

One of the most highly valued services across multiple customer verticals is reverse logistics. Depending on the merchandise being returned, this fast-growing area of logistics can include inspection, testing, repackaging, refurbishment, resale or product disposal, as well as refunding and warranty management. Reverse logistics services are mission-critical for companies with consumer end-markets, as shoppers are increasingly “test-driving” the merchandise they buy online.

Last mile is a $16B market where providers deliver goods to their final destination. Managed transportation is a $23B market where a logistics provider facilitates comprehensive transportation and logistics services. Services can revolve around supply chain visibility, expedited services, procurement, as well as supply chain performance monitoring.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, EBITDA Growth, FCF Yield, ROIC, Operating Ratio

Valuation & Comps

EV/EBITDA to FCF Conversion

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Trucking - Brokers & Logistics					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
ZTO	ZTO Express (Cayman) Inc (ADR)	27.1B	16.96X	16.39%	15.60%	24.31%	#VALUE!	9.92%	38.54%	16.58%	-0.87X
EXPD	Expeditors International of Washngtn Inc	17.9B	7.82X	(7.404%)	-27.14%	12.43%	8.39%	84.19%	23.17%	7.49%	-0.95X
UHAL	AMERCO	12.8B			#VALUE!	41.33%	#VALUE!	12.48%	-90.70%	3.98%	1.13X
CHRW	CH Robinson Worldwide Inc	11.2B	9.23X	2.49%	-14.57%	5.16%	9.55%	17.59%	27.48%	4.82%	1.69X
YMM	Full Truck Alliance Co Ltd - ADR	9.5B	339.08X	117.75%	36.85%	14.2%	#VALUE!	(17.884%)	445.16%	30.72%	-25.66X
LSTR	Landstar System, Inc.	6.2B	9.75X	3.04%	-17.31%	8.15%	7.05%	41.63%	6.17%	7.40%	0.07X
GXO	GXO Logistics Inc	5.5B	9.65X	10.34%	6.60%	8.4%	5.16%	7.87%	0.80%	1.97%	1.92X
R	Ryder System, Inc.	4.3B	3.29X	9.27%	-0.01%	22.96%	19.75%	4.39%	35.84%	9.83%	2.16X
XPO	XPO Logistics Inc	4.3B	5.55X	7.29%	-14.63%	11.57%	10.15%	9.09%	2.61%	-42.33%	1.72X
FWRD	Forward Air Corporation	2.8B	8.96X	(5.154%)	-0.42%	16.46%	8.13%	16.26%	33.87%	5.74%	0.29X
RXO	RXO, Inc.	2.0B	6.18X	10.16%	-4.99%	9.87%	9.23%		0.79%	-2.30%	-0.27X
CVLG	Covenant Logistics Group Inc	0.5B	3.61X		-10.35%	11.44%	#VALUE!	15.37%	56.21%	13.28%	0.33X
RLGT	Radiant Logistics Inc	0.3B			#VALUE!		#VALUE!		9.89%	5.56%	

Management Commentary

CH Robinson (CHRW) on environment…. "I talked about a deceleration in demand that we were expecting to see in the second half of 2022 in 3 large verticals for freight, including weakness in the retail market and further slowing in the housing market. We're now seeing those expectations play out and with slowing freight demand and price declines in both freight forwarding and surface transportation markets. Today, we believe that we're entering a time of slower economic growth, where freight markets will continue to cool from their pandemic peaks and will operate more reliably at more normalized rates with fewer disruptions. As inflationary pressures weigh on consumer discretionary spending and global economic growth, we continue to believe that our global suite of services, our growing digital platform, our responsive team and our broad exposure to different industry verticals and geographies, supported by our resilient and flexible non-asset-based business model put us in a position to continue to deliver strong financial results."

Landstar (LSTR) on the upcoming cycle….. "I don't think it's first half of next year. I think we've got a longer trend. If you look at -- we're heavily spot market. And if you look at the world of the spot market, there's a very consistent cycle. Peak to trough on revenue per load for us is probably an 18-month cycle. So for us, February of 2022 was the peak revenue per load on truckload, which is very strange because February is usually a soft month, and it was our highest on-record revenue per loan. So coming into this year, when you come into 2023, we're already -- the rate we're using for our guidance in the fourth quarter is already 10% behind the first quarter. So you already jumping into next year, 10% behind last year's first quarter, and we typically see a downward trend from December to January, about 5% to 8%. So going into the first quarter, I think our comps are very difficult. We're looking at rates that could be 15% to 20% down in the first quarter compared to last year -- this year's first quarter, which is a fabulous first quarter. And volumes are soft. So you're looking at a very challenging environment in the first quarter as it relates to comps, and I think we're going to see the similar thing in the second quarter. That 18-month cycle with revenue per load being its highest in February, if you go 18 months out, we're looking at an improvement in those dynamics sometime in the summer or later in the fall next year. And I'm a cycle guy. I'm not sure what would accelerate that and why the trough of earnings would be sooner than that or revenue per load."

GXO Logistics (GXO) on its growth pipeline…. "Our growth opportunity is best exemplified by our sales pipeline, which remains strong at $2 billion. The exciting thing is that our pipeline is diversifying. The mix of our current pipeline is skewing more heavily to industrial, technology and food and beverage, reflecting balanced growth in our verticals. At the same time, our retail and e-commerce partners are looking to GXO to help them expand footprint and geography. We're also seeing our pre pipeline filled with more transformational customer projects as companies strive for higher levels of both customer service and productivity. These types of projects are right in GXO's warehouse. Over the past 3 weeks, I've met in person with 15 of our top customers around the world. They are all looking for ways to deliver structural cost savings in their supply chain. And the #1 topic of the conversation is technology. And for 2023, we expect our core margins to improve due to maturing contracts, more automation and as Barish highlighted, an increased focus on productivity."

OptionsHawk Executive Summary & Focus Stocks

This group is really going to feel some pain from the peak trucking cycle with **CH Robinson (CHRW)** a good looking short. **GXO Logistics (GXO)** is a newcomer from the spin looks attractive with the logistics outsourcing growth opportunity, automation potential, moat around the business, and limited competition. **Ryder (R)** is severely undervalued and has attracted buyout interest, on deal watch for 2023.

Transports – Tankers & Dry Bulk

Resources: Alphaliner, Clarksons

Components: KEX, EURN, GLNG, FRO, STNG, MATX, ZIM, INSW, SBLK, GOGL, TDW, DHT, SFL, CMRE, DAC, TNK, NMM, EGLE, NAT, GSL, GNK, KNOP, SB

International & Private Peers: Maersk, Castor Maritime, Mitsui OSK, COSCO, Mediterranean Shipping Co., CMA CGM Group, Hapag-Lloyd, Ocean Network Express, Evergreen, HMM, Yang Ming, China Ocean Shipping, Hamburg Sud Group, Hanjin Shipping, Orient Overseas

Intro

This group is comprised of mostly smaller cap companies and the weaking global growth environment sets up for a very difficult 2023 with a combination weaker demand, over-supply and contracting prices. KEX expects favorable conditions in inland barging from high refinery and petrochemical plant utilization, increased volumes, and minimal new barge construction to support higher margins into 4Q22 and 2023. In Distribution & Services, Kirby sees favorable oil prices driving continued improvements in US rig and frac activity, as demand for new transmissions, parts, and service continues to rise.

Industry Backdrop & Investment Considerations

Global economic expansion is the main driver of world shipping demand as well as a strong global trade environment.

Following a period of significant overcapacity, and volatile and generally low profitability in the wake of the global financial crisis, the global container liner industry began to meaningfully consolidate during 2014-19. As a result, the six largest carriers now account for >70% of global capacity. These large carriers have further consolidated their operations within three global alliances, 2M, Ocean and The Alliance; these alliances handle the vast majority of containerized East-West trade (Asia-US-EU).

Perhaps the key driver of tanker markets is vessel supply. This is the ultimate driver of market fluctuation; when the market is in short supply of ships, the cost of chartering a ship – the freight – goes up but of course down if there are too many ships available. Tanker shipping is a highly cyclical business with freight rates driven by numerous factors, but in the medium to long-term vessel supply and demand are the main drivers. Vessel supply is the one factor controlled by the shipping industry and the supply of vessels is impacted largely by capital flows into and out of the sector, but also availability of financing from banks and other investors. A tanker market cycle generally begins with an oversupplied market where too many ships depress any earnings and therefore the capital flows out of the sector.

Indicators, Metrics & Stock Selection Framework

Price/Book, EV/EBITDA, ROE, FCF Yield, EBITDA CAGR

Valuation & Comps

EV/EBITDA to EBITDA CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Tankers & Dry Bulk					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
KEX	Kirby Corporation	3.9B	12.73X	15.58%	10.81%	15.15%	#VALUE!	0.79%	0.00%	3.23%	2.43X
EURN	Euronav NV	4.2B	13.82X	5.18%	51.41%	44.55%	0.62%	(10.465%)	-125.29%	93.72%	2.21X
STNG	Scorpio Tankers Inc.	3.1B	4.82X	(9.417%)	-19.01%	73.47%	#VALUE!	(5.213%)	8403.85%	100.49%	1.47X
FRO	Frontline Ltd	3.0B	8.42X	4.81%	35.84%	39.2%	2.69%	(1.462%)	-676.67%	118.17%	3.38X
GLNG	Golar LNG Limited (USA)	2.6B	9.30X	32.74%	31.69%	124.16%	#VALUE!	(10.406%)	-1435.00%	-38.19%	1.79X
MATX	Matson Inc	2.3B	1.64X	(23.829%)	-22.31%	33.85%	#VALUE!	47.76%	66.53%	7.74%	0.08X
ZIM	ZIM Integrated Shipping Services Ltd	2.2B	0.50X	(19.206%)	-45.63%	59.63%	#VALUE!	107.07%	2.92%	2.44%	0.18X
SBLK	Star Bulk Carriers Corp.	2.1B	3.80X	8.75%	-20.56%	73.6%	#VALUE!	15.13%	6.35%	-1.05%	1.02X
INSW	International Seaways Inc	1.9B	5.35X	(6.458%)	3.77%	66.33%	#VALUE!	(10.077%)	672.63%	63.86%	1.32X
GOGL	Golden Ocean Group Ltd	1.8B	5.52X	30.05%	-13.65%	60.43%	#VALUE!	6.58%	11.30%	0.87%	2.42X
TDW	Tidewater Inc.	1.6B	10.41X	28.85%	21.74%	27.15%	#VALUE!	(13.097%)	-74.75%	65.78%	0.32X
DHT	DHT Holdings Inc	1.6B	10.79X	12.64%	45.89%	59.42%	7.41%	(3.593%)	-208.77%	31.97%	3.22X
SFL	SFL Corporation Ltd	1.3B	7.96X	16.6%	7.85%	70.54%	#VALUE!	2.87%	46.41%	26.53%	4.79X
CMRE	Costamare Inc	1.1B	4.27X	(3.482%)	-1.02%	63.88%	#VALUE!	7.99%	51.55%	44.63%	2.81X
TNK	Teekay Tankers Ltd.	1.3B	5.66X	4.79%	18.89%	63.6%	#VALUE!		-204.32%	139.91%	1.43X
DAC	Danaos Corporation	1.1B	1.81X	(3.253%)	-4.70%	81.95%	#VALUE!	11.82%	84.90%	46.31%	0.44X
NMM	Navios Maritime Partners L.P.	0.8B	3.66X	1.48%	25.78%	55.11%	#VALUE!	17.56%	4.13%	64.05%	2.06X
NAT	Nordic American Tanker Ltd	0.7B	11.24X	51.28%	57.23%	62.44%	#VALUE!	(15.487%)	-107.25%	159.57%	2.60X
EGLE	Eagle Bulk Shipping Inc	0.7B	2.50X	(11.324%)	-22.31%	58.91%	40.48%	18.13%	-9.58%	18.53%	0.56X
GNK	Genco Shipping & Trading Limited	0.6B	3.21X	(5.408%)	-9.45%	67.32%	28.66%	16.32%	-12.52%	-11.34%	0.51X
GSL	Global Ship Lease Inc	0.8B	3.88X	13.65%	2.82%	64.57%	#VALUE!	10.53%	146.91%	57.26%	2.00X
SBLK	Star Bulk Carriers Corp.	2.1B	3.80X	8.75%	-20.56%	73.6%	#VALUE!	15.13%	6.35%	-1.05%	1.02X
KNOP	KNOT Offshore Partners LP	0.3B	8.27X	5.86%	2.04%	63.88%	#VALUE!	3.74%	24.82%	-4.07%	5.49X

Management Commentary

Kirby (KEX) on inflection of its main businesses….. "So the main business that we have is the Marine Transportation business. We are the largest inland tank barge operator in the United States. We're the second largest by barrel capacity for the coastal business. The second business that we have is the Distribution and Service business, basically power generation, diesel distribution and services oilfields, a component to it in terms of power generation as well as playing in the frac space. Both of these businesses are doing very well. We are coming out of, I'm going to say, barge building, overbuilding cycle that happened in the 2015 to 2017 time frame, and then you throw into that COVID and the impact of that. So the marine business is inflecting nicely. Utility is up. Rates are rising nicely, and we're very encouraged. On the Distribution and Service business, I think we all are familiar with what's going on in the oil and gas space. That has certainly helped us. Our order rate has gone up. Our book-to-bill ratio has increased nicely. Our backlog is actually 5x where it was 4 years ago -- 3 years ago, sorry, before the start of COVID."

Euronav (EURN) on crude transportation industry….. "Whilst volatility in energy prices has waned a bit recently, we continue to see the relative price of oil being cheap in comparison to other core energy sources. Oil is, therefore, relatively cheap in terms of a source of fuel at the moment and power and consequently, we believe that we will see not only fuel switching during this winter, but continue to see this trend well into next year. The dislocation and increased demand for oil is clearly illustrated on Slide 11. This shows the amount of oil and the water being transported in the dark blue line, the 1-year time charter rates for VLCCs given in the light blue line. Oil in seaborne transit is back to levels we have not seen since the very short spike we saw in March 2020, just ahead of the COVID pandemic kicking in. With ton miles continue to be a key feature of the dislocation, we anticipate that we will continue to see growth in oil, in transit on seaborne routes on similar patterns. So in summary of our market views, we continue to remain very positive on the current trends and expect to see a sustained and strong winter period."

Scorpio (STNG) on tanker demand…. "Refined product demand continues to increase as the global economy reopens from the COVID-19 pandemic. However, for several quarters, demand has outpaced supply, leading to a period of significant inventory draw. Since July 2020, the United States has drawn over 400 million barrels of crude oil and refined products. Globally, distillate inventories have increased over -- decreased over 200 million barrels and have not been able to build since 2020 despite lower jet fuel demand and higher refinery utilization. With demand expected to increase through 2023, refinery output will need to increase to meet incremental demand. Low inventories, growing demand and higher refinery output are all constructive drivers for product tanker demand. With inventories near historic lows, the ability to supply incremental demand from inventory draws is limited, and thus, product tankers now more than ever are being used to supply more immediate demand. The global supply-demand mismatch of refined product has less to do with Russia's invasion of the Ukraine and more to do with refining capacity closures, configurations and dislocations. New refining capacity will help to alleviate global shortages, but it won't be easy and will require increased demand for product tankers."

International Seaway (INSW) on supply/demand…. "Overall, we see a balanced market of supply and demand in the near term. This also means that inventory levels, which are already at the lowest level in 10 years are not likely to be replenished, and therefore, further market disruptions could create more demand for tankers. The strategic petroleum reserve has been covering shortfalls across the globe for the last several quarters. But soon, these releases will cease. And eventually, we will need to replace the barrels in the FCR, which should further create tanker demand."

OptionsHawk Executive Summary & Focus Stocks

We are at a very difficult part of the cycle for global shippers but there could be some opportunities in the oil tankers. **Golar LNG (GLNG)** is the name I feel most comfortable owning due to the strong LNG outlook. **DHT (DHT)** is the other small cap of interest entering a period of strong earnings due to the EU ban on Russian crude imports.

Consumer/Business Discretionary & Services

From a broader perspective the consumer has been strong, supported by improving wages and government support causing a swell in savings/wealth though inflationary pressures are a headwind. The acceleration in ecommerce and Direct-to-Consumer continues across several industries. The discretionary sector is one that underperforms during Fed tightening cycles, so that is another factor to keep an eye on. Millennials and Generation Z are two groups entering prime earning/spending years that are driving a lot of favorable growth trends.

Retail & Apparel – Auto Retail

Components: ORLY, AZO, GPC, AAP, VVV, DRVN, MCW, MNRO

International & Private Peers: CARQUEST, ICWG, Zips

Intro

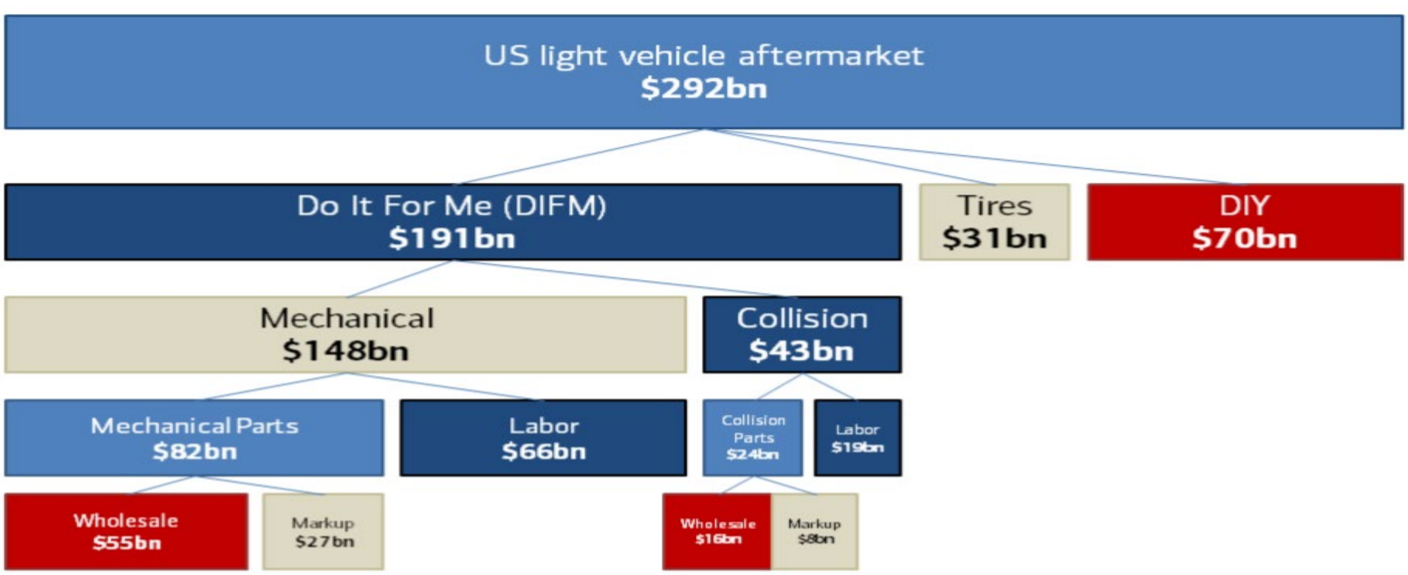
The auto aftermarket stocks have characteristics more similar to consumer staples than consumer discretionary. This is due to the needs-based nature of most auto parts and services, which keep vehicles running and enable vehicle owners to complete their day-to-day tasks. Auto Aftermarkets forecasts see ~3% growth in the industry for 2023 on inflation/pricing which is down from +14% in 2022 with miles driven recovering, pricing still positive, and units in DIY stabilizing with ongoing growth in DIFM. Sales growth in the $78b DIFM segment should outpace that of the $75b DIY segment. For '23, DIFM revenue may outgrow DIY by 500-700 bps. DIFM share of industry spend currently sits at 51% vs. 56% pre-COVID.

GPC continues to see strength within the Automotive segment across both the U.S. and European markets, driven by the non-discretionary nature of demand and structural tailwinds. Management believes the company is taking share in DIFM, largely from smaller peers (independents, warehouse distributors, etc.) that have been impacted by product availability headwinds, likely due to supply chain and labor. ORLY expects the recently implemented professional pricing initiative to bear fruit over the long term, while current industry pricing remains rational, and the company feels good about current demand trends, despite macro headwinds weighing on DIY. The momentum ORLY and AZO have garnered from price investments and consistent execution appears to be strengthening. AAP's continuous pivoting of its strategy is making it harder to close the gap with its peers. Conditions seem to be in place for EBIT margin expansion for AZO/ORLY, especially in 2H'23 and into '24.

High used vehicle values have incentivized vehicle owners to maintain older vehicles that may have otherwise been scrapped. A combination of higher scrappage rates, slower growth in the post-warranty vehicle population, and a return to normalized growth in miles driven will be net headwinds to auto aftermarket growth. While some cost headwinds such as product and freight inflation are likely to moderate in the medium term, mix is likely to remain unfavorable for auto parts retailers as growth in the lower-margin DIFM channel is expected to exceed that of the higher-margin DIY channel. At the same time, costs in the selling, general & administrative (SG&A) line such as wages, benefits, technology, and supply chain continue to increase.

Industry Backdrop & Investment Considerations

According to the Auto Care Association (ACA), the US auto aftermarket parts market amounted to $292B in 2020, with the DIFM market comprising approximately two thirds ($191B), DIY accounting for $70B and tire sales of $31B. The ACA estimates that the US light vehicle aftermarket has grown at a CAGR of 3.1% over the last 20 years and will accelerate to a CAGR of about 6.2% through 2024E. The $191B do-it-for-me market is highly fragmented, with public service providers like Driven Brands (DRVN), Mister Car Wash (MCW) comprising fractional market shares and dealerships and independent service chains commanding the vast majority of market share. Disruption to the auto aftermarket— online penetration, electric vehicle (EV) penetration, vehicle automation, supply chain disruption, etc.— is ultimately a net benefit to the large, well-capitalized auto aftermarket companies.



Source: Auto Care Association, BofA Global Research

The car wash industry is highly fragmented with the vast majority of the market comprised of independent operators that operate one or two locations. The size of the Car Wash & Auto Detailing industry is estimated at $13B in the US and $28B globally with a forward CAGR expected around 4.8%. In the U.S., more than 72% of drivers use professional car wash services frequently and conveyor car wash is the most revenue-generating service. According to the International Car Wash Group (ICWG), the U.S. car wash market offers significant growth potential owing to the rapid rise in the number of vehicles.

Miles driven is an important indicator for aftermarket parts demand in general, as many vehicle components wear down with use. US vehicle miles traveled is reported by the Federal Highway Administration (FHWA). The FHWA estimates that US miles driven has grown at a CAGR of 1.1% over the last 30 years, with two notable downturns: the Great Recession, and the COVID-19 pandemic.

The US fleet is likely to continue to age, reaching a median age about 12 years by 2025 and an average of over 13 years by 2025.

With approximately 282 million vehicles in operation as of 2020, the participants in the auto parts & repair industry play a vital role in maintaining the health of the vehicle fleet and servicing drivers' transportation needs. However, the US auto market is mature, so the vehicle population has limited room for growth, particularly as car sharing plays a larger role.

Vehicle complexity and size is a significant driver of aftermarket demand in the coming years. The mix of new vehicles sold has been shifting more and more away from cars and toward larger vehicles like crossovers, SUVs, and pickups (collectively classified as "trucks"). Although vehicle electrification (shift toward hybrids and all-electric vehicles) could create disruption in the new vehicle market, it has yet to have a significant impact on the auto aftermarket. The auto parts space has a unique ability to pass through higher costs to customers given the non-discretionary nature of the category.

Indicators, Metrics & Stock Selection Framework

P/E, EV/EBITDA, Operating Margins, Revenue Growth, SSS Growth, FCF Yield

Auto Parts retailers' comps have typically moved inversely with gas prices (-60% correlation on a 1-quarter lag). Thus, higher gas prices represent a risk to industry sales going forward.

Valuation & Comps

EV/EBITDA to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Auto Retail & Aftermarket					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
ORLY	O'Reilly Automotive Inc	51.2B	16.99X	7.69%	5.70%	23.54%	3.92%	60.16%	-1.68%	-0.89%	1.21X
AZO	Autozone Inc	45.0B	13.37X	6.85%	4.92%		5.77%	93.34%	12.78%	8.78%	
GPC	Genuine Parts Company	25.1B	13.64X	7.23%	3.17%	9.08%	5.25%	10.51%	7.95%	5.18%	1.31X
AAP	Advance Auto Parts, Inc.	8.6B	7.19X	8.06%	2.65%	12.05%	3.27%	15.54%	-7.93%	-2.56%	0.88X
VVV	Valvoline Inc	5.6B	19.55X	16.82%	12.89%	(12.397%)	#VALUE!	0.95%	-48.02%	-59.76%	2.38X
DRVN	Driven Brands Holdings Inc	4.8B	14.45X	10.63%	11.56%	25.04%	-3.03%	4.49%	40.70%	7.76%	4.62X
MCW	Mister Car Wash Inc	3.0B	14.00X	10.36%	9.26%	30.39%	-0.10%	10.79%	-16.30%	-1.45%	3.23X
MNRO	Monro Inc	1.5B	11.04X	8.48%	2.18%	12.96%	#VALUE!	2.2%	-22.17%	-2.61%	2.75X

Management Commentary

Genuine Parts (GPC) earnings call on industry tailwinds, digital and M&A initiatives…"Our automotive and industrial businesses continue to take advantage of several industry tailwinds. In automotive, the increase in year-to-date miles driven, an aging car park, limited new car inventory and elevated used car prices are all supportive of healthy demand in the aftermarket. In industrial, the manufacture and economy remains expansionary, with PMI holding at greater than 50%, while industrial production just had its ninth straight quarter of growth up 2.9% year-over-year. Digital channels across all customers also performed well with high single-digit sales growth during the third quarter, reflecting continued traction from investments in our omnichannel experience. U.S. automotive initiatives are advancing well with continued progress in talent, technology investments, customer segmentation, analytics, pricing capabilities and emerging tech. During the third quarter, we completed several bolt-on acquisitions primarily consisting of small automotive store groups that increased local market density in key geographies. The M&A pipeline continues to be active, and we will remain disciplined to pursue transactions that advance our strategy, deliver profitable growth and create long-term value."

O'Reilly (ORLY) on its ability to grow…. "We expect that we continue to have significant growth opportunities within the United States, both from an organic perspective. But really, our primary focus as an organization is to continue to drive growth out of our existing store base. We see ourselves as a consolidator and a share-gainer within still a very fragmented automotive aftermarket in the United States, and we think that that's a primary driver of growth and our ability to grow faster than the market. We still see attractive organic growth opportunities within the United States, and there are areas of the country that we're underpenetrated in and we think will be great markets for us. As we move forward, we will supplement that with a bigger and bigger part of our growth, still probably not the majority, but a bigger part of our growth, coming from expansion in Mexico. We're really ramping up the foundation and platform that we've got in Mexico to be able to add stores there and grow the O'Reilly brand there."

OptionsHawk Executive Summary & Focus Stocks

O'Reilly (ORLY) has long been the top name in this group and continues to execute well though now a 30% valuation spread with **AutoZone (AZO)** attractive as it continues to buy back stock aggressively. **Valvoline (VVV)** numbers look sloppy due to sales of the Global Products segment and is now a pure play auto services name that should be a multi-year positive story. **Driven (DRVN)** and **Mister Car Wash (MCW)** both trade 14X and have double digit growth outlooks with strong margins, though the former stands out with positive revisions while MCW faces multiple headwinds.

Retail & Apparel – Department & Discount

Resources: Modern Retail,

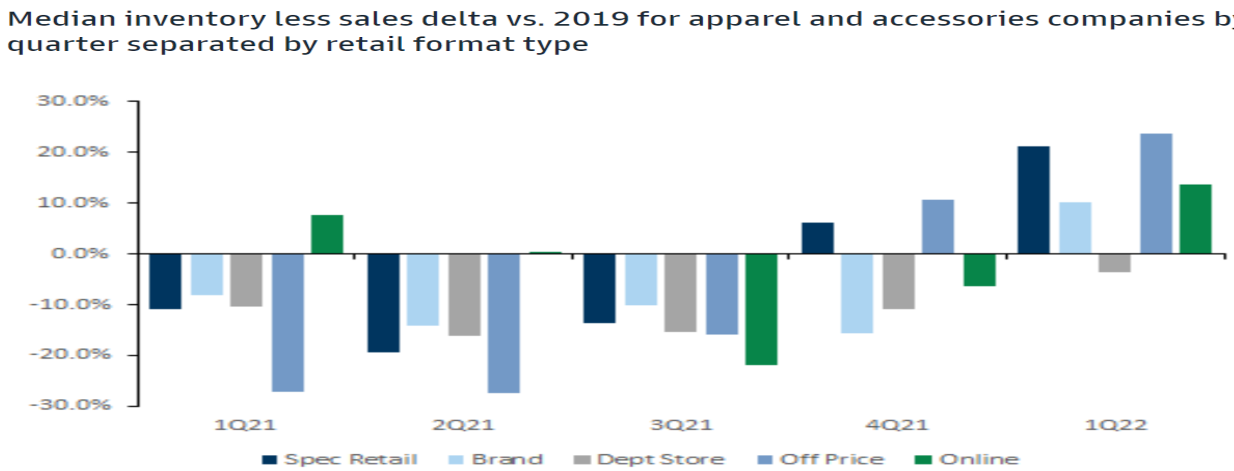
Components: WMT, COST, TJX, TGT, DG, DLTR, ROST, BJ, BURL, FIVE, DDS, M, KSS, OLLI, MNSO, PSMT, BIG

International & Private Peers

Intro

This group can be broken down further into Off-Price (BURL, ROST, TJX), Discount/Bargain (OLLI, FIVE, DG, DLTR, BIG, PSMT), Warehouse (BJ, COST), Department (KSS, DDS, M) and Multi/Broad-Line (WMT, TGT).

Inflationary pressures are weighing on consumer spending, particularly at the low/middle income levels, as nondiscretionary expenses (gas, grocery, rent) are elevated. Retailers faced significant supply chain headwinds last year, particularly in 4Q. This led to inventory gaps and subsequently lost sales, along with margin headwinds as freight rates reached all-time highs. Now, supply chain congestion is easing since consumer demand has softened, resulting in a decline in freight rates. Inventory levels across the retail space are at all-time highs. Many retailers placed orders when demand was quite strong which will result in increasing promotions and markdowns, taking a margin hit in the process. Closet restocking benefits are fading, wallet share is shifting back to services, and promotional pressures have started to accelerate.



WMT’s most recent quarter showed it is taking share in a tougher consumer environment with strength private brands and grocery. Warehouse clubs as better positioned compared to peers this Holiday season given their strong value proposition and membership strength. Dollar Stores also have counter-cyclical natures as consumers are challenged by inflationary pressures.

Department Stores carry the most margin risk in 2023 with elevated inventory leading to promotional activity. Department stores were in structural decline pre-pandemic, with sales falling in the years leading up to the pandemic. 2021 was a year of surging revenues from pent-up demand and above-peak margins thanks to lower inventory and higher than planned sales.

The macro backdrop provides ample market share opportunity for off-price retail, which will be a trade-down beneficiary for consumers looking for attractively-priced branded product. Heavy industry inventory levels create tailwinds for all off-price business models, even those with less developed buying programs - driving healthier mark-on, improved packaway opportunities, and stronger merchandise margins.

Indicators, Metrics & Stock Selection Framework

FCF Yield, Sales Comps, ROIC, P/E, Sales/Square Foot, Inventory Turnover, Operating Margins, ROE, Assortment Mix

Operating income dollar growth and market share are particularly relevant metrics to evaluate the underlying strength of these businesses.

Valuation & Comps

EV/Gross Profit to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Department & Discount					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
WMT	Walmart Inc	397.8B	12.68X	6.35%	2.78%	5.74%	2.30%	10.16%	-10.37%	2.61%	1.09X
COST	Costco Wholesale Corporatic	216.7B	19.66X	9.17%	6.17%		2.73%	25.97%	10.96%	11.35%	
TJX	TJX Companies Inc	91.5B	15.69X	10.57%	5.38%	13.78%	2.26%	96.81%	4.36%	1.12%	-0.01X
TGT	Target Corporation	69.4B	13.53X	39.54%	2.42%	6.44%	1.75%	19.39%	-62.28%	-1.31%	2.16X
DG	Dollar General Corp	54.4B	14.63X	9.05%	5.82%	9.7%	#VALUE!	20.58%	-4.61%	1.42%	1.43X
ROST	Ross Stores Inc	40.5B	16.46X	12.5%	6.02%	12.04%	1.71%	#######	-10.13%	-6.37%	-0.66X
DLTR	Dollar Tree Inc	32.4B	11.88X	5.27%	5.73%	8.22%	3.88%	13.79%	-8.99%	1.31%	1.33X
BURL	Burlington Stores Inc	12.8B	20.67X	35.36%	11.21%	6.02%	-3.64%	51.41%	-43.62%	-12.15%	2.12X
FIVE	Five Below Inc	10.0B	22.03X	21.02%	17.57%	7.52%	0.42%	33.42%	-16.37%	-5.39%	-1.00X
BJ	BJ's Wholesale Club Holdings	9.4B	10.63X	3.95%	6.09%	5.69%	6.75%	32.49%	18.87%	8.91%	0.80X
M	Macy's Inc	5.8B	3.38X	(5.354%)	0.08%	8.08%	19.08%	28.75%	-3.52%	0.91%	1.58X
DDS	Dillard's Inc	5.6B	4.40X	(39.499%)	-4.82%	18.98%	15.25%	37.77%	18.72%	7.28%	-0.07X
MNSO	MINISO Group Holding Ltd - /	4.5B	14.03X	26.77%	20.12%		#VALUE!	27.27%	73.06%	3.41%	
OLLI	Ollie's Bargain Outlet Holdin	3.2B	18.68X	42.69%	9.96%	9.44%	3.41%	15.84%	-26.90%	-4.82%	-1.26X
KSS	Kohl's Corporation	3.0B	5.18X	1.77%	1.22%	9.92%	3.62%	13.32%	-57.52%	-7.42%	3.10X
PSMT	PriceSmart, Inc.	2.0B	7.53X	6.38%	5.80%	5.54%	#VALUE!	9.0%	3.84%	10.14%	-0.38X
BIG	Big Lots Inc	0.5B	-12.46X	(337.867%)	1.26%	(7.734%)	#VALUE!	16.31%	#######	-10.95%	-0.81X

Management Commentary

TJX (TJX) on the environment in retail…. "While our business is not immune to macro factors, I am convinced that the flexibility of our off-price retail model and the depth of our expertise and experience, especially within our merchant organization, will remain an important advantage for us. As we enter the fourth quarter, we're in a terrific position to take advantage of the tremendous buying environment and to flow fresh exciting assortments to our stores and online this holiday season. We have many initiatives planned to drive sales and our value proposition remains very strong. Further, we are convinced that our great values will continue to resonate with consumers whose wallets remain stretched. Medium and longer term, we remain extremely confident that TJX is well positioned to gain market share and become an even more profitable company. First, in this inflationary environment, we believe it is important as ever to deliver shoppers excellent value throughout the store and online every time they visit. Second, as I've been saying all year long, the marketplace is absolutely loaded with quality branded merchandise across good, better and best brands. Importantly, this has set us up very well to offer an excellent assortment of branded gifts this holiday season that we believe will excite and inspire our shoppers. On the top line, we believe we are well positioned to capture additional market share. We see many opportunities to drive sales and traffic as we attract a wide range of customers across many income demographics, which we believe is a key advantage of our business. In a retail environment where overall pricing has been reset higher, we believe our value proposition will be even more compelling and visible to consumers and that our treasure hunt shopping experience will hold tremendous appeal. We also expect our overall expense headwinds to moderate and that freight will be a tailwind next year."

BJ Wholesale (BJ) on metrics and digital…. "As we've seen all year, traffic growth has been a positive driver of our comp and sales per member have been greater than last year in each of our income cohorts. In addition to the growth in gallons, our business has been more profitable. Gasoline is structurally more profitable than it was a few years ago, and the last several years and this year, in particular, have seen increased levels of volatility. The resulting higher than normal profit per gallon has served as a significant tailwind to our business this quarter and this year. Specifically, we have continued to invest in price, resulting in significant savings for our members. In fact, our internal analysis shows that our pricing positions remained stronger against our competitors in the third quarter compared to the same time last year. Our third strategic pillar is driving convenience through digital, and we are generating robust growth in this area led by BOPIC and curbside. In fact, our digitally enabled sales are trending towards 9% of our overall net sales this year, up from 8% last year. Digitally engaged members typically have higher average baskets and shop with us more frequently, which increases the likelihood of membership renewal."

Target (TGT) on owned-brands…. "Across the portfolio, owned brands continue to outperform their national brand counterparts, growing at double the rate of the total enterprise in the third quarter. Because of our unique industry-leading, in-house design and sourcing capabilities, Target's exclusive owned brands provide tremendous quality at incredibly competitive prices, a great combination anytime but never more so than in an inflationary environment."

OptionsHawk Executive Summary & Focus Stocks

The off-price names are in a good environment and coming off very healthy quarters and **Ross (ROST)** the favorite name in that grouping. **Costco (COST)** is a long-term compounder and valuation has come back into more attractive levels and membership fee increases a potential 2023 catalyst for upward revisions. **Dollar Tree (DLTR)** is the value buy as a multi-year turnaround story. **Five Below (FIVE)** a high-quality name as the top growth name but still may need to see valuation come lower with estimates coming down. **Dollar General (DG)** remains the best operator for discount retailers. The smaller names do not look attractive compared to the larger peers.

Retail & Apparel – Electronic, Health & Home

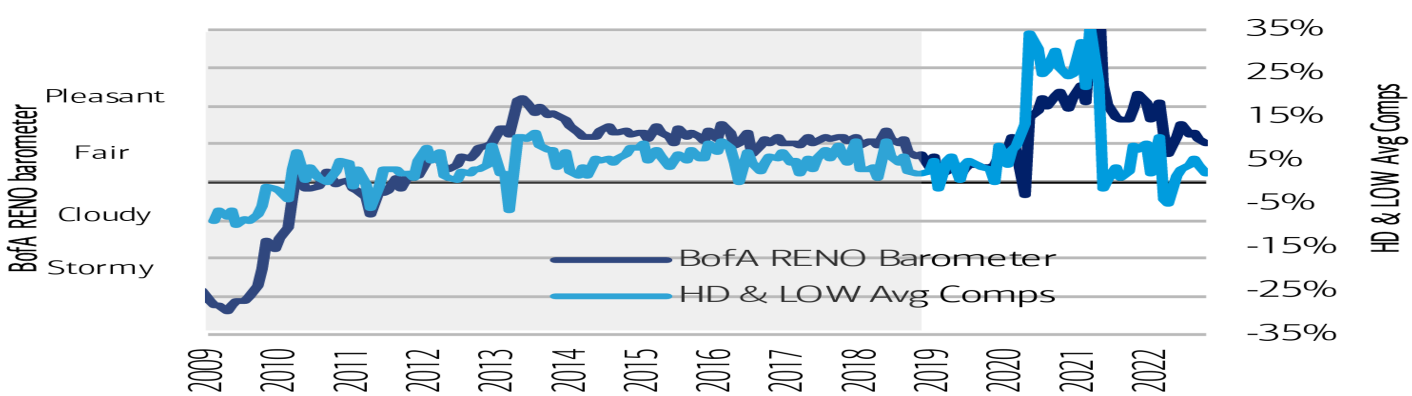
Components: HD, LOW, WBA, TSCO, BBY, GME, WSM, FND, RH, LESL, CENTA, CENT, RCII, ARHS, PRG, HVT, BBBY, RAD, AAN, TCS, LL, CONN

International & Private Peers: Kingfisher

Intro

Inside this group we have Electronic (BBY, GME), Home Goods (RH, CONN, WSM, HVT, BBBY, TCS), Healthcare (WBA), Home Improvement (HD, LL, LOW, TSCO, FND), Outdoor/Pet (LESL, CENT/CENTA), and Rental (AAN, RCII, FPAY, PRG).

Home Improvement has long been one of the strongest areas in this grouping but as noted in the Housing section previously there are signs of a slowdown in the repair/remodel industry with sales generally correlated to home prices which are seen falling in 2023 on lower affordability. Negative home price growth could continue into '24, pushing negative industry growth out to 2H'24 and the consensus does not appear to be embedding this risk into comps. Recent sales results from key vendors/suppliers across the home improvement space were weaker in Q3. BAML expects the RENO Barometer to trough in 4Q22/1Q23, followed by recovery in 2Q23 and sees LOW, HD, FND taking more market share from smaller independent retailers in this backdrop.



Home Goods has similar ties to the strength of the housing market so it certainly is an area that faces a tough backdrop in 2023 and coming off a pandemic-surge in the category for spending which now shifts to more non-discretionary areas. The group is working through supply-chain disruptions but also is facing incremental cost pressures. A surge in inventory leading to promotional activity and weaker margins is also a key risk. Promotional activity trackers are showing high levels across the industry. Home Furnishings demand far exceeded the historical trend during COVID ('20-'21). Inflation then supported incremental nominal growth in '22 to offset the beginning of unit reversion. '23 sets up as a year of continued unit reversion without as much (if any) tailwind from pricing. Negative earnings revisions is a likely theme in 2023.

Home Electronics is closely tied to consumer spending as a discretionary item and is likely to come under pressure in 2023 with inventory build a key concern across the retail industry. BBY has seen replacement cycles shorten within certain categories despite some pull-forward and higher promotions, and management remains focused on their health care products, digital platforms, and Totaltech program. Within consumer electronics, management noted that WMT and TGT are the primary players that have highlighted over-stocked inventory levels in the channel. Some customers are trading down, but there does not appear to be a broader trade down trend in place, while customers are also showing an increased interest in sales event, and promotions are expected to remain a headwind in the near term. BBY has gained a strong position in the increasingly competitive consumer electronics category, including in appliances where BBY is a top 3 retailer. BBY’s outlook implies a 4Q comp of -10%, and deceleration in 3-yr growth.

Industry Backdrop & Investment Considerations

The consumer electronics store industry is valued around $80B. The US home goods industry is valued around $311B with furniture growing faster than décor, kitchenware and small appliances. This group is closely tied to home ownership. The rent/lease-to-own market is composed of dealers who rent furniture, electronics, appliances, computer and other goods with an option to buy with estimates of a market opportunity of $25-$35B at 25-35% of the US population with < 700 FICO scores.

There has been marked growth across home improvement industries over the years, and current projections show dramatic growth is still happening. Both DIY project spending and the professional remodeling market are expected to keep getting larger over time. The U.S. spent $538 billion on home improvement in 2021. Home improvement sales are projected to reach $625 billion in 2025.

Indicators, Metrics & Stock Selection Framework

FCF Yield, Sales Comps, ROIC, P/E, Sales/Square Foot, Inventory Turnover, Operating Margins, ROE, Assortment Mix

Valuation & Comps

EV/Gross Profit to 3 Year ROIC Average

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Electronic, Home and Health											
HD	Home Depot Inc	339.3B	14.11X	(0.256%)	1.06%	17.73%	4.43%	27.93%	7.82%	4.89%	1.46X
LOW	Lowe's Companies Inc	127.7B	10.93X	(2.042%)	-4.83%	15.02%	6.11%	34.1%	15.06%	-0.97%	2.05X
WBA	Walgreens Boots Alliance Inc	35.4B	7.71X	9.31%	4.85%	3.06%	#VALUE!	7.86%	-10.65%	2.28%	2.53X
TSCO	Tractor Supply Co	23.8B	14.00X	8.0%	7.17%	12.04%	2.24%	40.41%	2.34%	2.32%	0.44X
BBY	Best Buy Co Inc	18.6B	6.52X	1.16%	-1.13%	6.03%	6.19%	214.47%	-26.67%	-8.15%	0.11X
FND	Floor & Decor Holdings Inc	8.3B	15.60X	21.85%	15.25%	13.47%	-3.25%	23.01%	-6.88%	-1.43%	0.53X
WSM	Williams-Sonoma, Inc.	7.8B	4.44X	(13.99%)	-2.54%	18.0%	11.37%	147.77%	15.61%	5.74%	-0.08X
GME	GameStop Corp.	6.4B		(53.295%)	1.31%	(5.614%)	#VALUE!		-9.03%	-7.56%	3.51X
RH	RH	6.2B	8.00X	(11.115%)	-2.61%	24.87%	#VALUE!	47.0%	-1.84%	-9.94%	1.21X
LESL	Leslie's Inc	2.2B	9.86X	10.75%	6.47%	20.93%	5.23%	416.69%	-16.16%	6.60%	1.60X
CENT	Central Garden & Pet Co	2.0B	8.64X	5.78%	2.19%	6.0%	#VALUE!	7.04%	-15.34%	-2.79%	5.89X
CENTA	Central Garden & Pet Co	2.0B	8.75X	5.78%	2.19%	6.0%	#VALUE!	7.04%	-15.34%	-2.79%	5.89X
ARHS	Arhaus Inc	1.4B	6.70X	24.73%	12.61%	17.72%	#VALUE!	(389.915%)	41.69%	2.35%	-0.41X
RCII	Rent-A-Center Inc	1.3B	5.76X	17.14%	-4.51%	11.23%	29.89%	22.32%	-23.89%	-7.97%	2.68X

Management Commentary

Tractor Supply (TSCO) on its business and opportunity…. "Key merchandise categories. We're a livestock animal feed and containment. We are the #1 retailer supplier for livestock animal in the U.S. We've sold over 5 billion pounds in feed last year, bag feed last year. Second, pet. We have a strong pet presence, food, supplies. We're a top 5 pet retailer in the United States. All the agricultural type side of the business, the 3-point equipment and fencing, we sell that. Truck and tool and hardware, we offer a deep assortment of that. And then lawn and garden, that could be riding lawn mowers, push mowers, live goods and plants. Sales have grown 65% since 2019. Comp store sales of over 40% since 2019 in that period of time. It's principally driven from 4 key tailwinds. There is a -- certainly a rural migration, a movement out of urban or suburban into ex-urban and the rural where our stores are at. They have the ability because of mobility and where they can work from home, and we're a benefactor of that. Pet ownership would be a second tailwind. Pets grown in the last few years significantly. Our customer has a high percentage of them owning pets and, in many cases, a high -- more than one pet. And then homesteading and self-reliance will the last other tailwinds, just being able to live life at home and have home be that place."

Best Buy (BBY) on promotional activity…. "The promotional environment continues to be considerably more intense than last year. Like Q2, the level of promotionality in Q3 was similar to pre-pandemic levels and in some areas was even more promotional as the industry works through excess inventory in the channel as well as response to softer customer demand. From a merchandising perspective, we saw year-over-year sales declines across most product categories. Consistent with the first half of the year, the largest impact to our enterprise comparable sales came from computing and home theater. ASPs will likely continue to be lower on a year-over-year basis as promotional activity that was largely absent during much of the pandemic has returned. As I step back at the highest macro level across retail, each customer is making trade-offs, especially with the significant impact of inflation on the basics like food, fuel and lodging. This disproportionately impacts lower-income consumers as a much larger proportion of their spend is on those basics. Across consumers, we can also see that savings are being drawn down and credit usage is going up. And value clearly matters to everyone. Our demographic mix is basically steady versus last year and pre-pandemic. Our blended mix of premium product is higher, both units and dollars than last year and pre-pandemic. Within some specific categories, we can see some cohorts of customers trading down but it is not aggregating into an overall impact."

Williams Sonoma (WSM) on B2B opportunity…. "As we talked about before, one of our largest is B2B, which had another excellent quarter, driving over $30 million in demand, a 17% increase to last year. We continue to believe our B2B business presents a sizable growth driver for us as it disrupts an underserved estimated $80 billion total addressable market. B2B is building velocity with large and repeat projects from commercial and hospitality partners like Marriott and Hilton. We are also focused on diversifying into new industry verticals, including the healthcare space through multiproperty partnerships with national accounts."

OptionsHawk Executive Summary & Focus Stocks

With the home improvement names following home prices it could be a tough year and **Home Depot (HD)** trades rich as a potential short target. **Tractor Supply (TSCO)** remains a favorite compared to those names with durable growth while **Floor and Décor (FND)** remains an excellent growth story where valuation has come into attractive levels. **Best Buy (BBY)** and **Walgreens (WBA)** continue to look like good shorts. **William Sonoma (WSM)** finds itself up against tough comps but is a top operator and gets put into the good long-term value at these levels bucket. There are a bunch of small caps facing a downward earnings cycle but **Arhaus (ARHS)** an intriguing own that is bucking the trend.

Retail & Apparel – Footwear & Apparel Retail

Components: GPS, JWN, VSCO, FL, URBN, AEO, BKE, BOOT, CAL, DBI, GES, ANF, SCVL, GCO, PLCE, ZUMZ, LE, TLYS, CATO, CTRN

International & Private Peers

Intro

The same headwinds facing other Retail groups are in focus for this group with rising costs and weakening demand along with margin pressures from promotional activity. Further, this group faces additional headwinds from weak mall traffic. Softline's are likely to face a negative earnings revision cycle that will weigh on the group particularly if a recession deepens. Softline businesses have historically proven to be early-cycle winners. Inflationary pressures are weighing on consumer spending, particularly at the low/middle income levels, as nondiscretionary expenses. Softline's stocks typically trade on rate-of-change and the focus is now on inventory levels & 4Q22/holiday concentration to assess 4Q earnings risk & potential 2023e earnings power. Softline's stocks are sitting in-line with 5Y pre-Covid average valuations, -18% below 5Y highs, & 26% above 5Y lows.

Industry Backdrop & Investment Considerations

According to Euromonitor, the global apparel & footwear industry is valued at $1.85 trillion and has grown at 1.5% CAGR over the past 10 years. Current estimates for the US Footwear market is $75B growing at a 3% CAGR while the US apparel market at $197B. A 15% CAGR is seen for online apparel revenues through 2025 driven solely by volumes.

The pandemic provided an opportunity for businesses to accelerate structural shifts such as channel rebalancing and cost leverage optimization (divestitures / headcount reductions). These shifts can provide durable margin opportunity and can fuel investments. The pandemic accelerated the shift to DTC digital. Critical within this shift is that many brands successfully drove an inflection in the profitability of DTC.com over the last year.

There are secular shifts towards comfort and casual wardrobes (vs. tailored clothing). The US sportswear market has grown at a 6.6% CAGR from 2015-2019, while the total US apparel and footwear market has grown only 2.0% in the same period, per Euromonitor. Product cycles that are currently gaining momentum include denim, premiumization, outdoor, slide sandals, and luxury.

Indicators, Metrics & Stock Selection Framework

FCF Yield, Sales Comps, ROIC, P/E, Sales/Square Foot, Inventory Turnover, Operating Margins, ROE, Assortment Mix

Other keys are brand momentum, product cycles, and idiosyncratic inflection points that can be critical drivers of sales and earnings regardless of point-in-time cyclical or macro impacts. Emerging and maturing growth companies often trade with top line momentum, while brands that have undergone turnaround processes often trade with EBIT as operating margins are taken into closer consideration as a leading indicator of profitability ahead of any potential sales inflection. Top line and operating profit growth drives stock performance in the apparel and brands sector.

Rank	Ticker	Inventory vs. Forward Sales (Y/Y)	2023 EPS Revisions	2023 EPS: MS vs. Cons.	2023 EPS: Normalized vs. Consensus	FY2 P/E vs. 2019
1	SKX	33%	-16%	5%	3%	-13%
2	TJX	41%	-8%	7%	-4%	6%
3	M	12%	-2%	4%	-64%	-32%
4	LULU	60%	5%	3%	13%	-15%
5	JWN	12%	11%	-7%	-28%	-29%
6	LEVI	22%	-16%	-10%	-9%	-33%
7	PVH	23%	-22%	-7%	-13%	-35%
8	ONON	36%	19%	5%	NA	NA
9	BBWI	41%	-30%	3%	-16%	20%
10	KSS	54%	-52%	-5%	25%	-26%
11	ROST	60%	-20%	0%	25%	-5%
12	FL	56%	-40%	4%	-43%	-12%
13	NKE	23%	-35%	NA	3%	-4%
14	BURL	64%	-49%	2%	112%	-3%
15	TPR	34%	-1%	NA	-40%	-28%
16	URBN	42%	-35%	3%	-58%	4%
17	ANF	78%	-69%	7%	133%	-12%
18	UAA	8%	NM	NA	-122%	-86%
19	BIRD	60%	NM	NA	NA	NA
20	VSCO	53%	-36%	5%	-277%	4%
21	CPRI	59%	5%	NA	-5%	-9%
22	WRBY	19%	-39%	-22%	NA	NA
23	GPS	41%	-73%	-44%	19%	64%
24	AEO	41%	-67%	-20%	-19%	11%
25	CURV	67%	-21%	1%	NA	NA

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Footwear & Apparel Retail					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
GPS	Gap Inc	5.1B	10.41X	65.79%	1.74%	7.33%	-1.73%	13.72%	-107.73%	-7.13%	0.96X
FL	Foot Locker, Inc.	3.4B	4.25X	(6.984%)	-2.25%	10.77%	4.55%	34.5%	1.13%	0.67%	0.09X
VSCO	Victoria's Secret & Co	3.4B	5.35X	6.33%	1.98%	8.39%	#VALUE!	92.21%	-32.02%	-6.13%	2.15X
AEO	American Eagle Outfitters Inc	2.9B	7.26X	15.25%	3.35%	13.6%	17.77%	26.54%	-57.69%	-13.12%	0.45X
JWN	Nordstrom Inc	2.8B	4.38X	4.22%	1.21%	5.84%	10.08%	8.09%	91.34%	7.00%	3.03X
URBN	Urban Outfitters, Inc.	2.5B	6.25X	12.47%	2.81%	7.02%	0.92%	23.7%	-42.67%	4.78%	-0.83X
BKE	Buckle Inc	2.2B	5.43X	1.44%	3.11%	25.22%	#VALUE!	(135.939%)	1.63%	3.88%	-0.91X
BOOT	Boot Barn Holdings Inc	1.9B	7.33X	4.29%	7.41%	15.06%	3.29%	36.93%	-5.83%	14.10%	0.52X
GES	Guess?, Inc.	1.1B	4.61X	5.59%	3.90%	11.51%	6.47%	30.83%	-20.20%	-1.34%	0.99X
ANF	Abercrombie & Fitch Co	1.1B	4.81X	17.59%	0.80%	6.15%	4.59%	113.1%	-96.67%	-5.67%	-0.06X
CAL	Caleres Inc	0.8B	4.21X	8.36%	2.06%		8.39%	52.05%	7.41%	4.89%	
DBI	Designer Brands Inc	0.6B	3.42X	(4.308%)	2.75%	10.14%	#VALUE!	24.23%	4.72%	-2.64%	0.98X
SCVL	Shoe Carnival, Inc.	0.7B	3.65X	9.98%	8.32%	14.57%	3.60%	54.51%	-23.30%	-1.19%	-0.28X
GCO	Genesco Inc.	0.6B	3.93X	10.44%	2.69%	8.96%	-34.49%	32.44%	-17.64%	-3.28%	0.14X
ZUMZ	Zumiez Inc.	0.4B	6.30X	17.26%	3.59%	6.58%	-8.93%	28.37%	-79.88%	-20.77%	-2.46X
PLCE	Children's Place Inc	0.4B	5.63X	3.15%	2.60%	14.06%	29.40%	122.41%	-68.02%	-11.55%	1.05X
TLYS	Tilly's Inc	0.3B	6.27X	20.38%	5.39%	5.53%	-6.36%	2.41%	-82.58%	-12.72%	-2.83X
LE	Lands' End, Inc.	0.2B	9.20X	23.24%	4.06%	4.49%	-11.89%		-121.30%	-6.16%	5.44X
CTRN	Citi Trends, Inc.	0.2B	5.24X	32.73%	4.77%	3.89%	-6.63%	116.54%	-83.17%	-19.72%	-1.76X
CATO	Cato Corp	0.2B			#VALUE!	(4.523%)	#VALUE!	13.16%	0.00%	0.00%	4.68X

Management Commentary

Gap (GPS) on inventories and categories…. “Next, let me share more on our inventory actions and assortment rebalancing efforts. We continue to rely heavily on markdowns and discounting to sell-through liable styles this quarter and have reduced receipts in Q4. These actions will allow us to enter fiscal 2023 in an improved inventory position. And beginning in Q1, our brands will benefit from our reinstated, responsive capabilities to chase into product demand. We're seeing an improved balance in the assortment across the portfolio compared to the first half of the year. And each of our brands were better positioned in the categories that resonate with the base consumer preferences, and our customers rewarded us for that. We saw consistent category strength in dresses, sweaters, pants and woven tops across the portfolio, with active underperforming across the board as consumers continue to shift away from the cozy, at-home lifestyle. While Athleta isn't immune to the change in consumer preference, despite the moderation of growth in the women's active market, the brand is showing strength in lifestyle categories like dresses and accessories that are demonstrating disproportionate growth in today's current environment.”

Victoria Secret (VSCO) on intimates’ industry…. “So this chart shows players in the intimates landscape, showing brands to the left-hand side of the chart and retail players or aggregates or marketplaces to the right-hand side of the chart. And what you can probably see is it's a very busy space. And on the right-hand side of the chart, there were department stores here who had most of the market, but the big box operators and the digital aggregators were not really active in the market. So while we've been going through this turbulent roller coast ride, the market has been changing. That said, it's still a very attractive market. We sized it at about $16 billion, some estimates have it at $18 billion. Within that, the foundation of the market is here in bras and panties at about $11.5 billion. Now that's really good news for us because that's where we're at our strongest. That is the core of our business, and we have a 21% market share, as I said earlier. Other things to note are shapewear and sport bras here where we're pretty underpenetrated. Our share in sport bras is 5% relative to much higher in structured bras. So keep that in mind. Another way to look at the market might be like this, where we divide the market into 5 different segments. So there's us at the top here with $3.2 billion in the intimate space. Remember, this excludes Beauty and sleepwear and Lingerie and swim and those things just intimate space, $3.2 billion. The biggest part of the market is the value brands segment, so the low price, low fashion operators, that's the biggest single part of the market. There's then the digital brands who didn't exist 8, 10 years ago. They've got to about $1.8 billion in overall revenues, pretty significant share of market for lots of companies that individually are quite small, but, in aggregate, it's quite an important part of the market.”

OptionsHawk Executive Summary & Focus Stocks

This group is all small caps and a group that lacks much growth and operates at low margins. With much better opportunities in other retail groups the only name of interest is **Boot Barn (BOOT)** which has been a favorite for a few years and continues to do well. **Caleres (CAL)** is a name that is relatively healthy and would consider as a potential M&A target.

Retail & Apparel – Grocery & Convenience

Resources: Supermarket News

Components: KR, ACI, CASY, MUSA, SFM, GO, WMK, IMKTA, VLGEA, NGVC

International & Private Peers: Publix, Ahold Delhaize, Couche-Tard, Trader Joe’s, 7-Eleven, SPAR, Carrefour, Lidl, Tesco

Intro

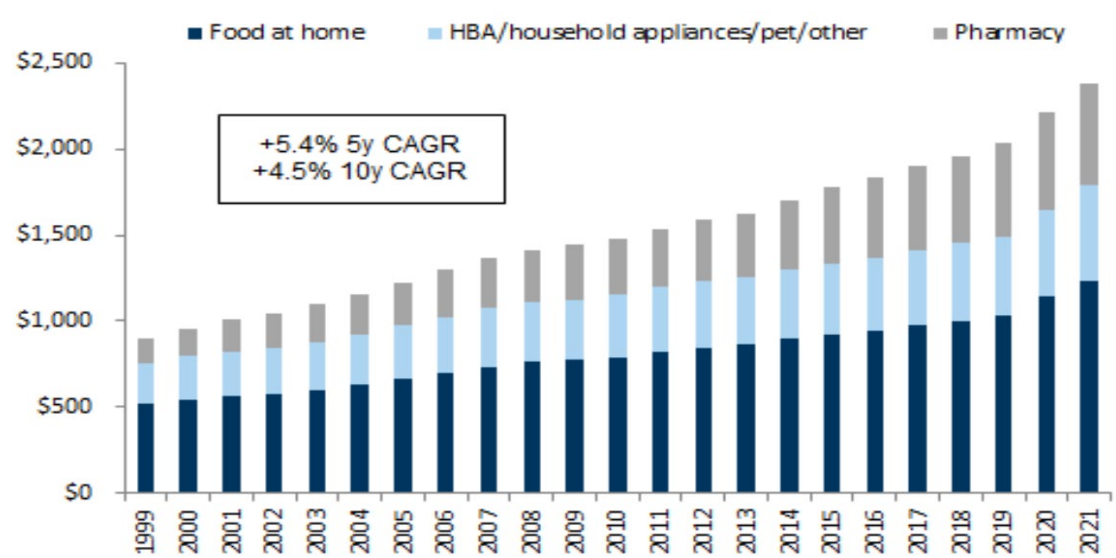
The two largest grocers recently announced a merger though a deal coming under scrutiny and may be blocked. Grocers are also competing with Walmart, Target and Costco. It is a group that correlates to food inflation and has done very well in the 2022 environment but now faces a more challenging backdrop as both fuel/food inflation cools. There remains plenty of positive tailwinds, however, food inflation remains elevated, food at home spending is tracking at a 7% CAGR outpacing Clothing, Furniture, Appliances and Electronics, improved execution of omni-channel capabilities, enhanced digital investments and competitive strengths versus smaller grocers. Market share gains are likely from greater value offerings, including private label and trade-down, as consumers manage inflationary pressures and recession fears.

After 2+ years of elevated demand from at-home tailwinds and inflationary top-line support there is an expectation for a slowdown due to wallet share normalization towards restaurants plus moderating inflation. GO's value-based offering of closeout food should continue to gain market share, while its unique operating model with Independent Operators results in more resilient margins. SFM's higher fresh exposure results in greater top line risk from decelerating inflation/ potential deflation.

The convenience store names have benefitted from record fuel margins which are unlikely to sustain but have also launched plenty of margin-enhancing initiatives the last few years. The industry still has a long runway for further consolidation as well.

Industry Backdrop & Investment Considerations

Total sales from grocery stores amount to nearly $700B although a low growth and low margin business. The U.S. grocery retail market is dominated by chain supermarkets. In 2018 there were around 31,669 chain supermarket locations in the United States, compared to only 6,638 independent supermarkets. US grocery retailers compete for nearly $2tn of consumer spending across categories ranging from core Food & Beverage (>$1tn) to HPC, HBA, and pharmacy. Some retailers will compete for gasoline sales as well, expanding the total addressable market to over $2.3tn. Total supermarket PCE (ex-fuel) has grown at CAGRs of 3.8% and 3.6% over the past 5 and 10 years, respectively, generally tracking in line with the broader US economy (GDP CAGRs of 4.1% and 4.0%). Grocery retail has been growing at a 3.3% CAGR for the last 15 years, with the sector growing even during the recession of 2007-2009.

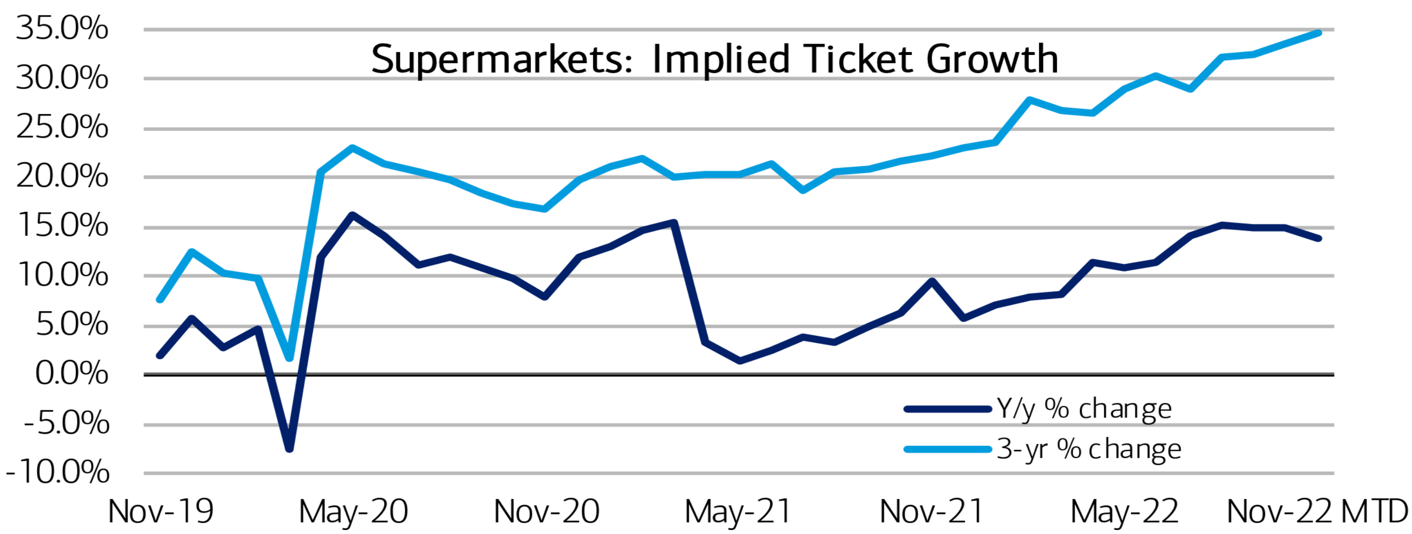


The industry remains fragmented (top 20 represent only ~39% of addressable market) but discount concepts (e.g., hard discounters, dollar stores, mass merchants) have been gaining market share consistently for over a decade, with traditional grocers the primary share donor. This market share shift began with mass merchants (WMTs supercenter rollout) and has been extended by concepts like Aldi/Lidl as well as the dollar stores.

Top 20 grocery retailers represent ~40% market share

	Revenue ($bn)	2021	%	HHI
1	Walmart U.S.*	$262	11.0%	1.2%
2	Kroger (ex fuel)	$123	5.2%	0.3%
3	Costco U.S.*	$77	3.2%	0.1%
4	Albertson's (ex fuel)	$68	2.9%	0.1%
5	Ahold-Delhaize	$54	2.3%	0.1%
6	Sam's Club*	$51	2.1%	0.0%
7	Publix	$48	2.0%	0.0%
8	Target*	$48	2.0%	0.0%
9	H-E-B	$33	1.4%	0.0%
10	Dollar General*	$26	1.1%	0.0%
11	Meijer	$20	0.8%	0.0%
12	Aldi	$18	0.8%	0.0%
13	Wakefern	$18	0.7%	0.0%
14	Amazon (in-store)*	$17	0.7%	0.0%
15	Dollar Tree*	$16	0.7%	0.0%
16	Trader Joe's	$14	0.6%	0.0%
17	HyVee	$12	0.5%	0.0%
18	BJ's Wholesale*	$12	0.5%	0.0%
19	Wegmans	$11	0.5%	0.0%
20	Southeastern Grocers	$10	0.4%	0.0%
	Top 20	**$936**	**39.3%**	**1.9%**

While online grocery penetration remains low (est. less than 4.5% in 2018), major retailers are leaning into new service offerings (e.g., in-person delivery, drive-up, in-store pickup, ship-from-store or DC for drygoods) and the category is growing quickly. Estimates call for online grocery to rise to 21.5% of total US grocery sales by 2025, more than doubling the current share.



The US retail fuel and convenience store industry is large, growing, and highly fragmented. Key trends include sensitivity to gas prices among cost conscious consumers, and increasing customer demand for low-priced fuel and high levels of consumer traffic around supermarkets and large format hypermarkets, supporting complementary demand at nearby and cross-promoted retail fuel stores. The decline of cigarette smoking, the rise of GPS-enabled smartphones, the development of more fuel-efficient vehicles, and other factors, are forcing gas stations and convenience stores to rethink how they draw customers in. The gas and convenience businesses that are thriving are investing in food and more specialty retail. Regional chains such as Wawa, Sheetz and RaceTrac are now competing with coffee shops and restaurants to protect themselves against changing consumer tastes.

Indicators, Metrics & Stock Selection Framework

FCF Yield, Sales Comps, ROIC, P/E, Sales/Square Foot, Inventory Turnover, Operating Margins, ROE, Assortment Mix

Looking at the 20-year time frame through 2021, grocery store retail sales grew at a +3.2% CAGR, slightly above FAH CPI of +2.2%, recognizing the category's stronger correlation to GDP as consumers likely trade-up to more premium products in stronger economic backdrops.

Valuation & Comps

EV/EBITDA to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Grocery & Convenience					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
KR	Kroger Co	32.0B	5.97X	1.21%	2.33%	4.77%	7.17%	10.38%	17.66%	7.83%	1.88X
ACI	Albertsons Companies Inc	11.1B	3.67X	(0.591%)	1.55%	5.85%	12.10%	20.22%	2.38%	7.73%	1.11X
CASY	Casey's General Stores Inc	9.1B	11.29X	(1.023%)	1.48%	6.83%	#VALUE!	8.55%	24.70%	20.78%	1.20X
MUSA	Murphy USA Inc	6.4B	6.69X	(3.019%)	-1.65%	5.92%	#VALUE!	18.53%	99.22%	39.45%	1.09X
SFM	Sprouts Farmers Market Inc	3.7B	7.52X	1.55%	6.14%	7.64%	#VALUE!	25.06%	5.64%	0.29%	-0.09X
GO	Grocery Outlet Holding Corp	3.0B	14.34X	11.2%	10.33%	6.44%	#VALUE!	6.9%	6.38%	5.97%	1.20X
WMK	Weis Markets, Inc.	2.3B			#VALUE!	5.19%	#VALUE!	7.49%	0.00%	0.00%	-1.38X
IMKTA	Ingles Markets, Incorporated	1.9B		4.61%	2.99%	8.68%	#VALUE!	16.35%	0.00%	0.00%	0.63X
VLGEA	Village Super Market, Inc.	0.5B			#VALUE!	4.76%	#VALUE!	4.66%	#VALUE!	#VALUE!	-0.25X
NGVC	Natural Grocers by Vitamin Cottage I	0.2B	4.94X	5.44%	5.18%	3.81%	#VALUE!	6.26%	3.13%	9.70%	1.19X

Management Commentary

Sprouts Farmer Market (SFM) earnings call on food trends, private label and expansion plans…"Deli continued to be a top performer as customers sought Sprouts as a destination to fulfill their appetite for healthy prepared meals and grab-and-go options such as sandwiches, salads and snack boxes. The other categories of strength were where we have the most innovation and differentiation, including bakery, grocery, dairy and frozen. Recently, we completed the implementation of a new real estate tool. This tool does 3 things for us. One, it provides details of the Sprouts white space for every MSA in the country. Based on the tool, we believe that our brand can support 1,350 total stores in the Continental U.S. an incremental 970 from where we stand today. Outside of projects, we're doubling down with our brands. So far this year, we've launched an additional 400 private label products and repackaged more than 450 with an updated design that highlights vital product attributes and is also considered more appealing based on customer surveys. Our brands nonperishable sales growth during the third quarter was more than double that of branded products."

Murphy USA (MUSA) on value offering and fuel margins…."We have prospered during periods of sharp rising product prices that threatened broader consumer spending. Tobacco margins were up nearly 6% and non-tobacco margins were up nearly 9%. Powerful proof points that our low price offer is resonating across categories, resulting in volume growth and market share gains. Finally, I would note that while debate and uncertainty continue to exist with respect to the new baseline for long-term fuel margins, the excess cash generated and used to buy back shares over the past 3 years represents real and enduring value to long-term investors with more than 25% of outstanding shares being repurchased over that period. Investors who have held throughout this period has not only enjoyed significant price appreciation but can expect to enjoy a greater percentage of future earnings and shareholder distributions without having allocated more capital to the Murphy USA investment. It's important to note we see recent margins reactive to and reflective of typical volatility related to the up and down swings in product prices. So while some may be tempted to label third quarter retail margins as an outlier, this level may simply be reflective of what the industry can expect in future periods of falling prices and indicative of a higher equilibrium industry structure that reflects the higher cost of doing business for the marginal convenience store retailer.”

OptionsHawk Executive Summary & Focus Stocks

The large grocer merger between ACI/KR could fail to pass and either way the set-up for grocers is weakening and **Kroger (KR)** is a potential short in 2023. **Casey’s (CASY)** and MUSA also face tough comps and weak growth outlooks with CASY trading very rich compared to MUSA and is another potential short. **Sprouts (SFM)** and **Grocery Outlet (GO)** are more interesting names with growth upside but a difficult choice as SFM trades at half the valuation but GO offers much better profit growth. I am not too excited about owning any of these names in a competitive industry with weak growth/margins.

Retail & Apparel – Specialty

Components: ULTA, DKS, BBWI, FCFS, ASO, SIG, EYE, ODP, SBH, HIBB, TITN, BRLT, CHS, HZO, FLWS, EZPW, SPWH, DLTH, BGFV, BBW, TCS, JOAN

International & Private Peers: LVMH, L’Oreal, Kering, Avenue Supermarts, AEON, Pandora, Chow Tai Fook

Intro

The remaining “specialty” retailers that did not fit into the other categories include Beauty (ULTA, SBH, BBWI), Sporting Goods (DKS, HIBB, BGFV, ASO, SPWH), Pawn Shops (EZPW, FCFS), Gas Station Stores (MUSA), Optical (EYE), Jewelry (SIG), Gifts (FLWS), Crafts (MIK, JOAN), Boating (HZO), Party (PRTY), and Ag/Construction Equipment (TITN). Without many clear comps the group basically must be looked at individually per company.

The slowdown in discretionary spending is leading to more promotional activity and lower margins across many of these retail categories with 2023 EPS outlooks at risk with the weakening consumer backdrop. DKS is one name that stood out with a recent strong report as demand is holding up and it managed well through a tough inventory cycle. The pawn shop stocks have some momentum as names that outperform in recessionary environments (FCFS, EZPW).

Industry Backdrop & Investment Considerations

The US beauty products and salon services industry is approximately $150B in sales. The approximately $61B salon services industry consists of hair, skin, and nail services. Beauty cycles are impacted by demographics, trends, and product innovation.

The sporting goods industry is valued at $70B, a fragmented market of retailers. The market for sporting goods retailers is highly fragmented and intensely competitive. Modell’s, Cabela’s, Bass Pro Shop, and REI are other notable competitors in this space.

The pawn industry in the U.S. is well established, with the highest concentration of pawn stores located in the Southeast, Midwest and Southwest regions of the country. The U.S. pawn industry, although mature, remains highly fragmented.

The party supplies market is estimated at $18B including a $9B Halloween market and seen growing at a 4.9% CAGR through 2026. Crafting activities continue to enjoy broad based popularity and market size has been stable, valued at approximately $36B. It is a highly fragmented market with competition across multi-store chains, mass merchandisers, local specialty and internet retailers. Hobby Lobby and Jo-Ann Stores are two notable competitors to Michael's.

The total jewelry and watch market was approximately $80B at the end of 2020, and Signet (SIG) with a 7% market share, estimates of 19,800 jewelry stores in the US in a highly fragmented market. The jewelry industry generally is affected by fluctuations in the price and supply of natural diamonds, gold and, to a lesser extent, other precious and semi-precious metals, and stones. The retail jewelry industry is competitive.

Indicators, Metrics & Stock Selection Framework

FCF Yield, Sales Comps, ROIC, P/E, Sales/Square Foot, Inventory Turnover, Operating Margins, ROE, Assortment Mix

Valuation & Comps

EV/EBITDA to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Specialty Retail					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
ULTA	Ulta Beauty Inc	23.6B	12.86X	2.43%	7.28%	17.97%	#VALUE!		33.27%	9.23%	-0.20X
DKS	DICK'S Sporting Goods Inc	9.6B	5.38X	(3.306%)	1.73%	13.91%	5.78%	73.5%	-4.94%	0.31%	0.05X
BBWI	Bath & Body Works Inc	9.6B	9.38X	10.95%	3.78%	16.05%	#VALUE!	46.21%	-33.12%	-7.95%	4.36X
ASO	Academy Sports and Outdoors Inc	4.3B	4.80X	1.08%	4.22%	14.53%	9.04%		8.92%	-3.38%	0.38X
FCFS	Firstcash Holdings Inc	4.3B	9.93X	13.9%	9.32%	16.19%	5.57%	4.73%	2.93%	6.63%	2.84X
SIG	Signet Jewelers Ltd.	3.2B	3.70X	(9.282%)	1.02%	6.42%	9.16%	85.57%	-7.01%	-2.94%	-1.09X
EYE	National Vision Holdings Inc	3.1B	18.14X	13.62%	7.08%	8.9%	#VALUE!	11.97%	-34.86%	-7.28%	1.76X
ODP	ODP Corp	2.1B	4.23X	(1.553%)	-2.14%	6.03%	#VALUE!	63.83%	3.10%	1.97%	-0.48X
SBH	Sally Beauty Holdings Inc	1.3B	5.31X	1.64%	1.50%	11.67%	13.74%	18.04%	-16.50%	-7.03%	2.48X
TITN	Titan Machinery Inc.	0.9B	7.35X	0.09%	10.64%	9.49%	6.85%	18.35%	89.04%	33.66%	1.09X
HIBB	Hibbett Inc	0.8B	4.06X	9.01%	6.60%	10.44%	0.81%	70.7%	-12.78%	2.36%	0.25X
CHS	Chico's FAS, Inc.	0.7B	3.04X	8.16%	4.99%	8.12%	17.07%	21.56%	97.83%	3.53%	-0.43X
HZO	MarineMax Inc	0.7B	2.38X	(8.927%)	-0.27%	10.45%	#VALUE!	38.58%	6.03%	-2.29%	-0.39X

Management Commentary

Dick's (DKS) on structurally higher margins, inventory and growth….. "As we indicated on our last call, at the end of Q2, our inventory position was strong, and we were back in stock in key items. We achieved double-digit EBT margin of 10.3% in the quarter, over 3x our 2019 rate on a non-GAAP basis. This was driven by our structurally higher sales, expanded merchandise margins and greater operating efficiency. Looking ahead, our inventory is healthy and well-positioned, and we're excited about the assortment that we have in place for the holiday season. Because of our continued strong performance, quality of inventory and the confidence we have in our business, we're raising our full year outlook. Yes, we still believe that we will be able to retain a significant amount of our merch margin gains. This particular quarter, if you look back at Q2, we had indicated that we had gotten a lot of late receipts in from spring that came in on top of our back-to-school inventory, and we were heavy in apparel, and we aggressively took care of that this quarter to clean up our inventory so that we could maintain -- so we've taken holiday merchandise and start 2023 clean."

Titan (TITN) on drivers of a strong quarter…. "At the segment level, our Agriculture segment was a clear beneficiary of the strong demand we are seeing, which was supported by timely deliveries of inventory. Our Construction segment also experienced strong same-store sales growth, driven by robust demand for equipment, a notable strength in parts, service and rental. Likewise, the improved pretax margin in our Construction segment reflects the improved operating efficiency that we've been focusing on driving over the past several years across the optimized footprint. Road construction and other infrastructure projects are in full swing throughout our markets, and farmers and ranchers are continuing to purchase equipment for land improvement, feedlots and material handling. Furthermore, the strong overall industry also continued to drive demand for rental equipment, which produced another solid quarter for fleet utilization."

OptionsHawk Executive Summary & Focus Stocks

Ulta (ULTA) is the best-in-class name in a resilient beauty industry and continues to post fantastic numbers while having the best margins in the group yet still at just 19X Earnings. **First Cash (FCFS)** is an attractive name with pawn shops doing well in recessions and has a strong growth outlook with solid profitability metrics. Among the very small names I see some value in **Hibbett (HIBB)** at these levels and **Titan (TITN)** has been a real strong story with the Ag cycle and looks to have further room to run.

Media & Entertainment – Streaming Media

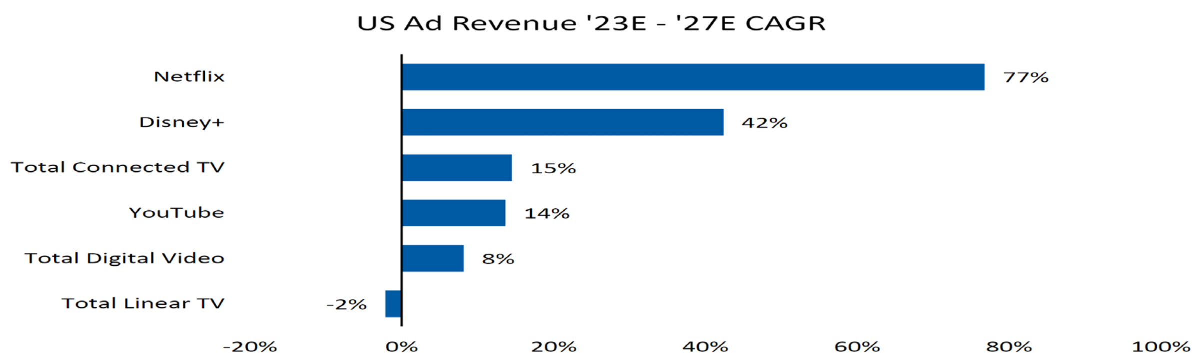
Components: DIS, CMCSA, NFLX, LSXMA, SIRI, SPOT, WMG, ROKU, TME, RUM, IQ, IHRT, FUBO, HUYA

International & Private Peers

Intro

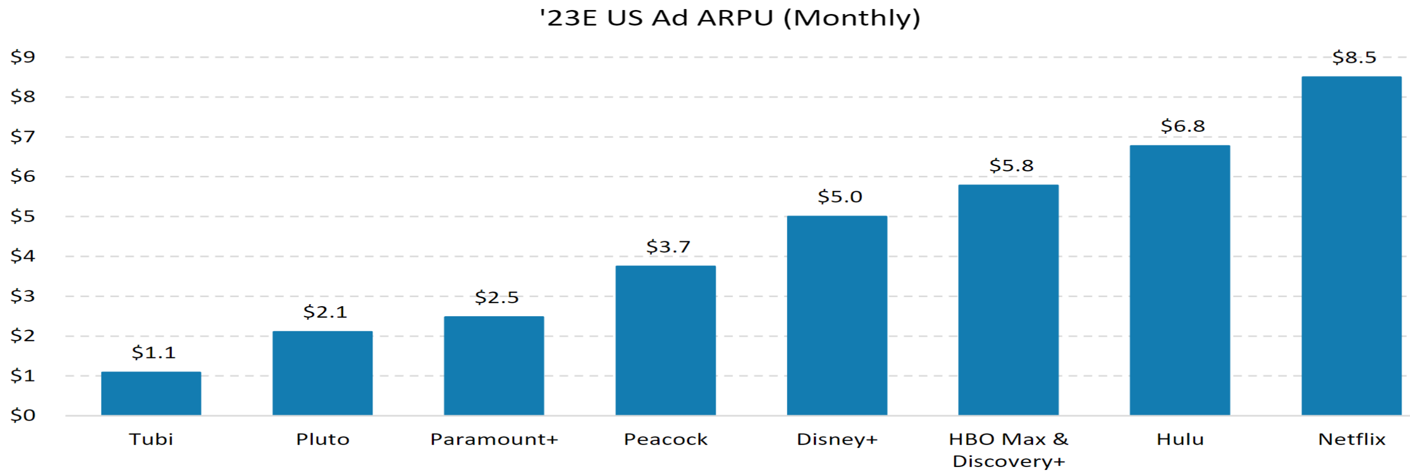
Streaming media companies came under pressure in 2022 as the market showed preference for cash flows and capital returns while these companies are spending a lot of cash flow on content and investing in the businesses with an intensifying competitive environment as dozens of new streaming services launched. Iger's recent return to lead Disney with a focus on profitability of the streaming segment speaks volumes. Rising macro headwinds make it difficult to be bullish on advertising driven stocks.

Through their new ad-supported tiers, Disney and Netflix may be introducing the most significant new source of premium video ad impressions to the US ad market since the rapid growth of YouTube over the past decade plus. There is rising optimism over the revenue opportunity for these new entrants with the US CTV ad market growing at a ~15-20% '22-'26 CAGR, surpassing $30B.



Streaming is also maturing and headed to low single-digit growth by 2025. Ad ARPUs are a function of 1) engagement, 2) ad load, and 3) CPMs. US advertising spend via connected TV is expected to grow double digits through '28E, largely taking ad share from linear TV. Streaming's share of TV viewing minutes continues to grow; at pace of the last ~two years, it will overtake non-streaming by mid-23.

(in millions)	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Connected TV US Subscribers							
Netflix	66.8	67.7	68.9	70.1	70.8	71.2	71.4
Disney+	43.4	48.1	52.5	56.3	58.8	60.3	61.3
Peacock	28.7	38.1	42.6	45.2	46.9	48.2	49.1
Tubi	45.4	50.5	54.3	57.3	59.8	62.0	64.0
Paramount+	26.4	31.5	35.0	37.5	39.0	39.8	40.3
Pluto	38.5	40.5	42.5	44.3	45.5	46.3	46.8
WBD (Discovery+ & HBO Max)	55.2	55.7	56.7	58.2	58.7	59.2	59.7
Hulu	42.7	44.5	46.7	48.3	49.3	50.2	51.0
ESPN+	23.8	26.8	30.0	30.5	31.0	31.5	32.0
Roku (1)	52.7	54.8	56.2	57.2	58.3	59.3	60.4
Total Connected TV US Subscribers	**423.6**	**458.0**	**485.3**	**504.7**	**518.0**	**527.9**	**535.9**
Growth	*16.6%*	*8.1%*	*6.0%*	*4.0%*	*2.6%*	*1.9%*	*1.5%*



Industry Backdrop & Investment Considerations

The U.S. media and entertainment (M&E) industry is the largest in the world; represents a third of the global M&E industry; and contributes more than $717B to the economy. The opportunity for streaming remains immense with it still just accounting for ¼ of total TV usage.

Demand is strong and being driven by consumers and advertisers both shifting to streaming platforms, but content costs are also rapidly rising and restraining the ability to translate revenues into earnings/FCF. The global transition of all media from legacy distribution to Internet distribution continues to march on, with investors most skeptical on the transition in the video space.

Podcasting will drive the next leg of growth for the audio industry with podcasting advertising revenue at an industry level growing at a ~30% CAGR through 2025 driven by a growing supply of podcasts and strong consumer demand as more people discover podcasting content that interests them.

The industry appears optimistic the scarcity of inventory, greater efficiency of digital advertising and improved targeting capabilities will drive CPMs higher to create a win-win for the entire ecosystem (better viewing experience combined with more relevant ads). As the transition continues, there is also a general consensus the industry needs significant improvement in measurement capabilities. The appetite for independent content remains extremely robust as major studios increasingly retain content exclusively for in-house streaming platforms. Production costs continue to rise as deep pocketed/ non-traditional economic models compete with traditional studios for material/talent.

Music industry positive trends are driven by the secular growth in streaming and opportunities from new emerging streams such as gaming/metaverse, social media and fitness along with new geographies such as Latin America, Africa and Asia. Social media platforms such as TikTok enable artist discovery and can improve reach to fan bases, while NFTs present additional monetization opportunities for content and/or experiences. Declining linear TV ratings will continue to result in advertising dollars shifting into the audio ecosystem. Podcasting's robust growth, healthy reach and significant ad tech/digital capabilities (targeting/attribution) position the medium well to capture a significant share of shifting advertising demand. Streaming music appears more resilient than streaming video to macro headwinds

Indicators, Metrics & Stock Selection Framework

Revenue Growth, EV/Revenues, EV/EBITDA, EV/FCF, FCF/Debt, EBIT/Interest, Operating Margins

Valuation & Comps

Sub-Industry	Price to Earnings			Adjusted Price / FCF			EV / Unlevered FCF			EV/EBITDA			Dividend Yield %		
	2022E	2023E	2024E	2022E	2023E	2024E	2022E	2023E	2024E	2022E	2023E	2024E	2022E	2023E	2024E
Large-Cap Media	26.7x	16.2x	13.4x	97.2x	43.2x	27.7x	70.6x	77.0x	32.7x	13.5x	11.4x	10.1x	0.4%	1.1%	1.9%
Internet Media	19.7x	18.5x	15.2x	31.0x	26.0x	20.0x	NM	26.2x	19.4x	13.2x	12.2x	10.1x	0.0%	0.0%	0.0%
Mid-Cap Entertainment & Sport	30.5x	45.9x	41.1x	32.6x	36.3x	27.1x	30.2x	35.0x	29.1x	21.3x	20.7x	17.9x	0.5%	0.5%	0.5%
Mid-Cap Advertising & Film	13.4x	17.1x	13.8x	15.5x	13.3x	12.0x	13.5x	15.3x	13.4x	9.7x	9.3x	8.7x	0.0x	0.0x	0.0x
Cable/Satellite	11.3x	11.7x	9.9x	17.0x	11.7x	10.0x	15.4x	15.7x	14.3x	7.4x	7.3x	6.8x	2.2%	2.0%	2.2%
Arithmetic Average	20.3x	21.9x	18.7x	38.7x	26.1x	19.4x	32.4x	33.9x	21.8x	13.0x	12.2x	10.7x	1.4%	1.5%	1.7%
Cap Weighted Average	19.6x	18.3x	15.2x	35.4x	26.1x	19.7x	9.6x	29.9x	20.3x	12.7x	11.7x	9.9x	0.4%	0.4%	0.6%

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Streaming Media					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
DIS	Walt Disney Co	171.7B	14.58X	21.86%	7.26%	11.59%	2.66%		-7.85%	6.02%	4.04X
CMCSA	Comcast Corporation	158.7B	6.82X	4.59%	-1.01%	31.77%	8.66%	5.57%	1.44%	-0.91%	2.42X
NFLX	Netflix Inc	141.3B	23.83X	25.02%	7.54%	22.34%	0.81%	23.05%	-6.54%	-5.50%	1.14X
LSXMA	Liberty Media Corp	34.5B	14.18X	8.25%	15.26%	22.1%	#VALUE!	(2.3%)	158.70%	4.84%	2.19X
SIRI	Sirius XM Holdings Inc	23.8B	12.25X	4.55%	3.00%	31.58%	6.37%	17.2%	-9.38%	0.28%	3.38X
WMG	Warner Music Group Corp	17.6B	16.96X	14.0%	8.58%	18.44%	3.37%	7.54%	10.42%	3.19%	2.98X
SPOT	Spotify Technology SA	15.8B	-24.33X		15.28%	(6.061%)	0.28%	(11.751%)	-5392.45%	1.36%	2.52X
TME	Tencent Music Entertainment Group - ADR	13.3B	20.40X	4.38%	3.93%	23.72%	#VALUE!	8.66%	17.89%	-9.38%	-0.57X
ROKU	Roku Inc	7.3B	-44.85X		6.35%	(4.524%)	-2.00%	46.6%	205.06%	-18.02%	14.16X
RUM	Rumble Inc.	2.3B	-93.23X		254.47%	(65.864%)	-0.78%	785.22%	166.67%	23.10%	6.74X
IQ	IQIYI Inc - ADR	3.1B	19.47X	36.43%	6.52%		#VALUE!	(37.236%)	-92.72%	-5.29%	
IHRT	iHeartMedia Inc	1.1B	6.72X	17.15%	-1.36%	25.51%	29.79%	(2.508%)	-210.71%	-4.88%	5.25X
HUYA	HUYA Inc - ADR	0.8B	7.58X	(71.443%)	-2.73%		#VALUE!	103.76%	-201.30%	-18.41%	
FUBO	Fubotv Inc	0.5B	-1.47X	(44.624%)	29.75%	(41.242%)	-49.08%	(66.545%)	25.20%	-11.71%	-0.17X

Management Commentary

Warner Music (WMG) on stronger streaming growth…."Q4's uptick in subscription streaming growth and the benefit from emerging streaming platform deal renewals more than offset the decline in ad-supported revenue. Artist Services continued to recover in Q4, increasing by 33%, while licensing and physical were up by 38% and 6%, respectively. As we look ahead, there is tremendous momentum in both the short and long term. I consistently told you that streaming revenue would continue to have significant runway that we would have price increases and ongoing subscriber growth and that emerging platforms would continue to expand. We're now seeing all these come to fruition. Most significantly, Apple and Geyser recently announced price increases. Making these announcements in the current economic environment shows that music subscription services offer amazing value to consumers. Music remains undervalued, but we're optimistic that there will be other increases to come."

Spotify (SPOT) on Macro sensitivity and margins…. "But for Spotify, our business continues to perform very nicely around the world. And outside ads, we aren't seeing much impact at all. And the ads business is still growing and will be important, but it remains a relatively small portion of our overall revenue to date. And our Q3 results clearly show that our investments in the product and experience have resulted in strong user growth, retention and increased engagement, but they've also been a drag on near-term margins. And because of the strength of this relationship, we know that spending to acquire new users is a worthwhile investment that over time will have a meaningful return. So here's how we think about it: this trade-off is worth making if our actions result in an increase in lifetime value of a user, and we also maintain a healthy customer acquisition cost-to-LTV ratio. We've been transparent that 2022 was going to be an investment year, which would result in a drag on our gross margin in the short term. This quarter is case in point. But it shouldn't come as a surprise that nothing really has changed with our fundamentals. Our business is strong.

We are heading into 2023 with more cost certainty, stronger product and a better user proposition. So this is all playing out largely as we expected despite the macro environment."

OptionsHawk Executive Summary & Focus Stocks

Disney (DIS) looks cheap to peers with profits set to grow strong the next few years and now a larger focus on profitability for the Streaming business while being one of the stickier services. DIS has the strongest IP in the universe and can lever a strong recovery. **Warner Music (WMG)** is a quality business I have grown to like, and I am positive eon recent developments. **Spotify (SPOT)** is a bit of an enigma as profitability remains in question but the company is coming out of an investment year and should support it coming back into favor.

<u>Media & Entertainment – Traditional Cable</u>

Components: WBD, FOXA, PARA, NXST, TGNA, TV, LGF, SBGI, SSP, GTN, AMCX, QRTEA, DWAC

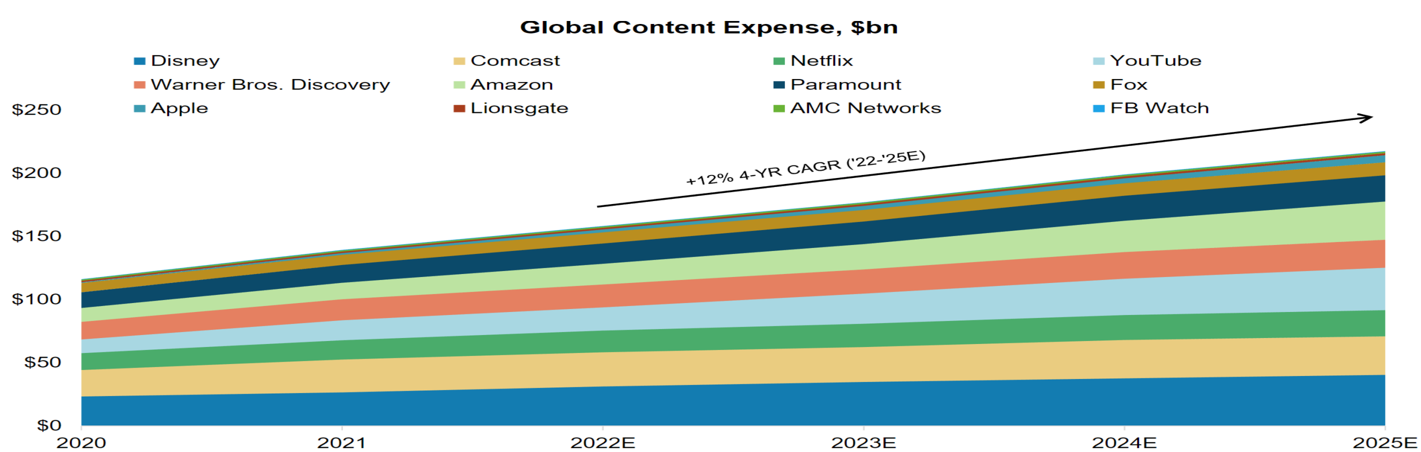
International & Private Peers

Intro

Ad-supported tiers from Disney and Netflix are creating new competitors for ad dollars in a slowing albeit still-growing US ad market. Global streaming video net additions continue to slow, down 34% YoY, as companies pivot to prioritize reducing losses over maximizing subscriber growth. Fundamentals are most robust in sports rights inflation and the return to live. Linear TV pressures appear to be increasing, with cord cutting re-accelerating and expected to hit 6-7% by YE22.

With the pace of traditional linear video subscriber losses accelerating, legacy media companies have pivoted toward direct-to-consumer (DTC) offerings – initially subscription video on demand (SVOD), but more recently adding services such as advertising video on demand (AVOD) and free ad-supported streaming TV (FAST). Globally, AVOD is expected to grow to $70bn in 2027, up from $33bn in 2021 with the U.S. specifically increasing to $31bn (from $9bn in 2021). Notably, 13 countries are expected to each generate >$1bn in AVOD revenues by 2027. This significant growth across several markets presents a sizeable opportunity for media networks to offset lost traditional advertising dollars.

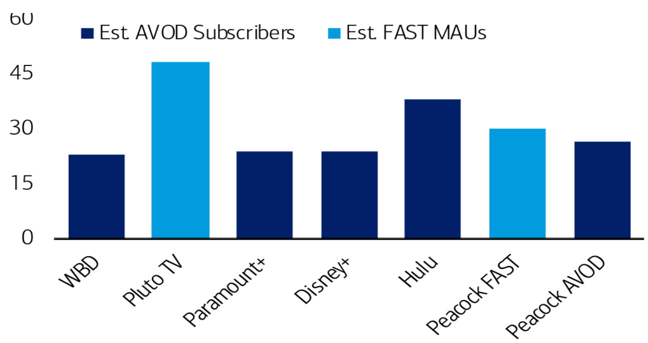
Key benefits include: 1) increasing the subscriber TAM (particularly internationally) and reducing churn, 2) capturing incremental viewership as pay-TV subscribers cut the cord, 3) creating a powerful combination of TV's reach with direct advertising's targeting down to the household level and 4) potentially growing the TV advertising pie and serving as a platform to siphon advertising dollars from social media, YouTube, etc. However it also presents challenges with lower ad loads and pricing not able to offset linear ad dollars lost on a 1:1 basis and requires significant technology expenditures.

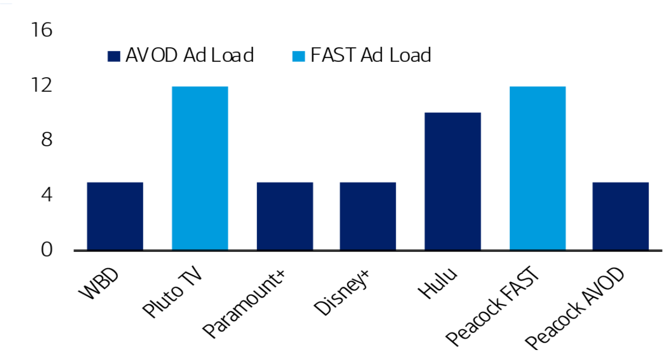


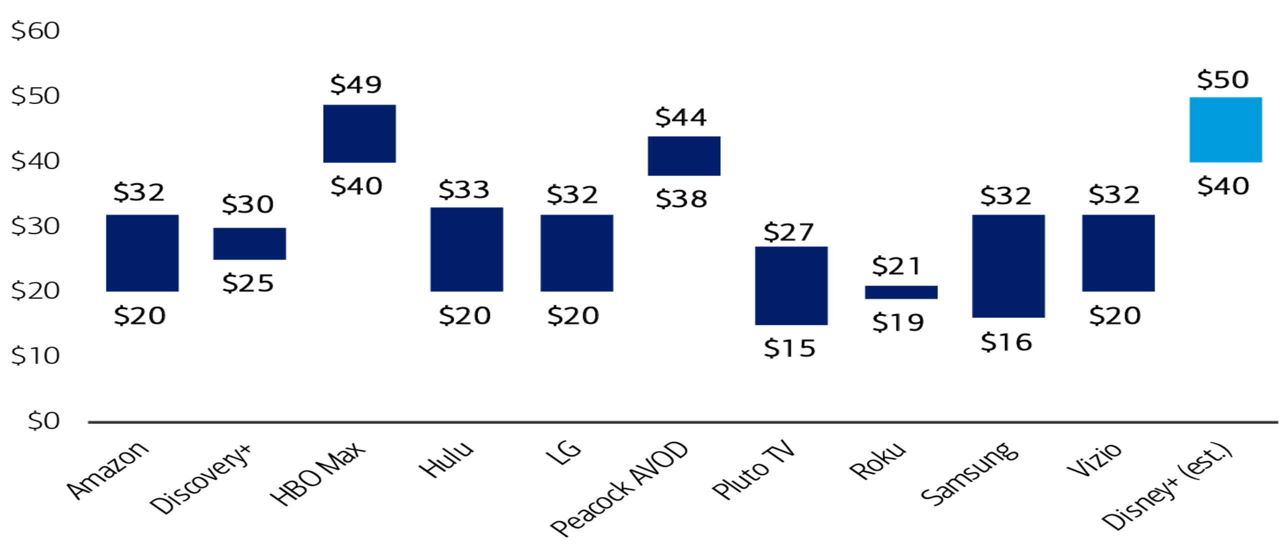
Industry Backdrop & Investment Considerations

Traditional media remains in a secular decline with subscribers migrating away from PayTV and TV advertising revenues having peaked years ago. With legacy cable and broadcast networks under pressure from cord cutting, forcing media companies to pivot to streaming, several media companies have opted to consolidate. The key driver of subscriber growth and retention will be original content investment along with the breadth and quality of each service's content library.

Broadcast networks have the highest CPMs within the linear TV ecosystem at an estimated $35, on average (total day, P2+), which compares to an estimated $25 for premium cable networks and an estimated $15 for standard cable networks. We define premium cable as live news, sports, etc., whereas, standard cable is the long tail of programming/networks. Ad-loads are one of the key variables driving the variability in outcomes in the transition to AVOD. As these services launch, most companies plan to keep adloads low to enhance the consumer experience, acquire subscribers and establish the service. An additional lever media companies could also utilize is brand sponsorship of content. CPMs for various streaming services are in the $20-30 range.

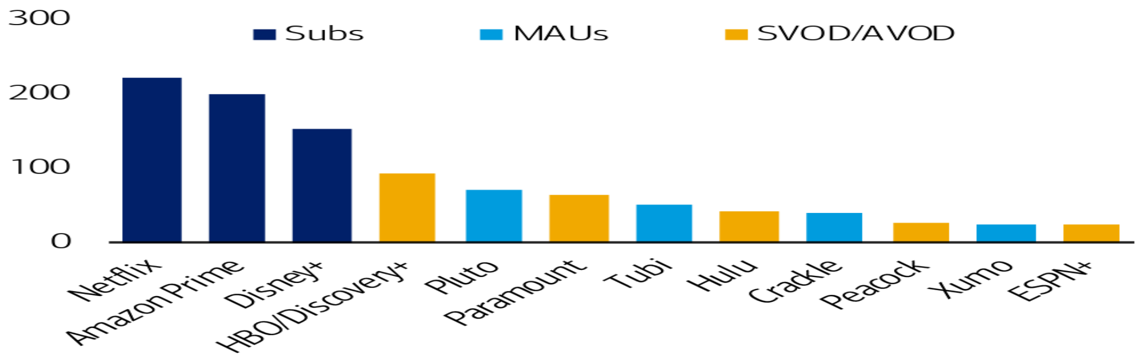






Indicators, Metrics & Stock Selection Framework

EV/EBITDA, Debt/EBITDA, EV/Revenues, Revenue Growth, EBITDA Growth, EBITDA Margins



Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Traditional Cable					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
WBD	Warner Bros Discovery Inc	26.7B	8.35X	10.2%	2.41%	24.68%	12.37%	4.94%	-154.29%	245.12%	5.05X
FOXA	Fox Corp	16.8B	5.74X	(10.154%)	-1.62%	34.21%	13.48%	9.93%	20.68%	7.76%	0.49X
PARA	Paramount Global	12.9B	7.82X	17.53%	2.55%	11.36%	1.12%	4.63%	-26.67%	-1.05%	3.85X
NXST	Nexstar Media Group Inc	6.8B	6.22X	23.77%	-1.01%	38.7%	20.45%	1.45%	7.35%	0.26%	3.51X
TGNA	Tegna Inc	4.4B	6.08X	44.25%	-5.37%	34.32%	17.33%	7.08%	-7.51%	-3.78%	2.52X
TV	Grupo Televisa SAB (ADR)	356.0B	5198.14X	4.58%	3.53%	34.56%	#VALUE!	2.36%	-12.26%	-26.31%	2.34X
SSP	E W Scripps Co	1.2B	7.45X	70.73%	-3.67%	24.36%	27.03%	4.57%	-45.35%	-7.00%	5.02X
SBGI	Sinclair Broadcast Group Inc	1.1B	5.32X	36.51%	-17.08%	28.83%	66.78%	(4.926%)	-1465.86%	-39.80%	3.87X
GTN	Gray Television, Inc.	1.1B	6.28X	62.47%	-10.63%	36.96%	49.92%	1.23%	-27.57%	-2.93%	4.84X
QRTEA	Qurate Retail Inc	0.8B	6.13X	16.37%	-5.46%	16.51%	#VALUE!	2.0%	-70.90%	-10.01%	3.79X
DWAC	Digital World Acquisition Corp	0.8B			#VALUE!		#VALUE!		#VALUE!	#VALUE!	-0.10X
AMCX	AMC Networks Inc	0.8B	4.58X	(0.869%)	0.38%	32.86%	4.58%	15.41%	0.00%	-3.02%	2.28X

Management Commentary

Paramount (PARA) at RBC Conference on its Streaming success, profitability and advertising markets… "We got a D2C business that's closing in on a $6 billion revenue run rate. We are the video partner powering Walmart+. We're the fastest-growing streaming service in the U.S. market this year. But at the same time, the market has gotten very, very focused on really 3 issues, I think, the sort of state of the current advertising market changes in the linear ecosystem and streaming profitability. So on the advertising market, the reality is, yes, there are headwind, it's not a great advertising market, but it's a cycle. And we've seen cycles before. They are not necessarily that long, most of what we've seen as these things last a few quarters. And so the real question to focus on is whether you can be in a position to succeed when the market returns. So we think we're very well positioned to win when the advertising market returns, which it will. And then you go to the question of streaming profitability. And there, the market has gotten very, very short-term focused. And with that sort of focus, I think you missed the important impact that growth in pricing and continued expansion of the streaming TAM will have in that profitability equation, we feel very confident in both of those things. I think you missed the tremendous operating leverage that is enabled by combining a traditional media business with a streaming business and what that means in terms of the cost of delivering content, the cost of acquiring subscribers, which are very different in our world than a pure-play streaming business. And I think importantly, and this is probably the most significant thing that I think The Street is missing with respect to streaming profitability is, there's a presumption that the investments we're making in streaming are sort of sunk costs. And that's just not accurate because when you look at the dollars we're spending, it is overwhelmingly in content. But if you look at valuation of the business, it implies that streaming actually has a negative value and therefore, assuming those assets actually are not valuable. And that's -- it just doesn't make any sense, given what we're doing in terms of how we're building that business."

Warner Brothers (WBD) on business transformation…. "Clearly, the D2C area for this combined company is going to be the most important growth driver going forward. So very, very important strategic growth driver, very important source of synergies because we are going to combine 2 technology stacks into one. We are going to be able to much more efficiently and effectively market that D2C product and all of our products with the combined company footprint but not the end-all, be-all purpose of the company to exist. David has talked a lot about FAST as an area that we want to add to the mix here. We got a deep library of content. We know we need to make sure that there's as little in the way between new consumers and our content. And we're not going to tell you whether you have to come through our own app or whether you want to come through an Amazon Prime video channel, whether you want to use something on linear. We're going to be open to all those forms of distribution. We've got long-dated debt, 14.5 years average maturity, very little maturities coming up over the next 2 to 3 years. We're going to generate a multiple of that in free cash flow even in sort of slightly more stressed scenarios. And most importantly, it's very, very attractively priced debt. So by all means, I think we're going to be ending up buying back a lot of that long-dated debt that sends for the dollar. And to your point of free cash flow generation, there's no doubt right now for sort of quarter cash flow as an example is a little depressed by deal-related expenses, restructuring expenses going through. And also keep in mind that we just guided to an incremental sequential $2 billion of synergy capture in 2023 versus 2022. We've done the work. We've got these initiatives lined up. And a lot of that is obviously going to drive free cash flow into next year."

Fox (FOXA) on delivering strong results in a tough environment…. "Financially, we delivered 5% growth in our top line revenues, led by an 8% increase in advertising and 3% growth in affiliate revenues. Our advertising growth in the quarter was driven by strong pricing at FOX News and FOX Sports, record first quarter political revenues at the local stations and in a quarter where industry-wide digital advertising revenues appear to have been under pressure, to be posted standout revenue growth of almost 30%. However, we recognize that there is a lot of commentary around advertising headwinds as the macro environment evolves. Yes, the broader national advertising market is looking more fluid compared to the time of our last earnings call. However, the macro impact is not uniform across our verticals. While we have observed some softness in the linear entertainment scatter marketplace, remember that FOX does not over-index to network entertainment. So any impact there is nominal to us and has been more than offset by the digital entertainment strength delivered by TUBI. Additionally, despite the economic headwinds, we are seeing continued strength across our linear news and sports portfolios, led by the pharmaceutical, restaurant and streaming categories. These dynamics underscore a flight to quality and the importance of our focus on live content with over 2/3 of our advertising revenue generated by live sports and news. At our local stations, we generated record political revenues for the September quarter. Elsewhere, the story at TUBI is breathtaking with first quarter revenue growth reaccelerating to almost 30% over last year."

OptionsHawk Executive Summary & Focus Stocks

Nexstar (NXST) has been a strong performer for many years but into 2023 see it as a short with tough comps coming out of a political ad spend year. **Paramount (PARA)** and **Warner (WBD)** remain complete disasters with their expensive shifts to streaming and expect that to weigh for a while along with the debt-load. **Fox (FOXA)** is a name with value at 5.75X EBITDA and without the debt issues of the others while offering a 13% FCF yield and exposure to live sports and news makes it more durable. I do not see any standout small cap names either with most names saddled with debt and seeing revenues decline.

<u>Media & Entertainment – Print Media</u>

Components: NWSA, PSO, NYT, WLY, SCHL, DJCO, RSVR, GCI, PLBY

International & Private Peers

Intro

This is a smaller group and like the rest of the media group driven by advertising is facing a tougher Macro backdrop on spending cuts. The largest player, News Corp, jumped in October on media reports that Rupert Murdoch is exploring a recombination of the two wings of his media empire nearly a decade after they split. The shifts to digital subscription content platforms remains the major theme. Pearson in education is becoming more digital and more direct-to consumer as it implements a new strategy under CEO Andy Bird. NYT held an Investor Day in June outlining its digital transition and runway for subscriber growth and higher margins, 50-55% gross margins in '27E, 20%+ EBITDA margins longer term.

Industry Backdrop & Investment Considerations

The US printing and publishing industry is a $243B market that includes books, newspapers, periodicals and commercial, the latter the largest at 30% of volumes. The newspaper publishing industry is a $20B market with revenues falling at a 7.2% CAGR the last few years. The commercial print industry is also highly fragmented.

The demise of print-media is well known, and these companies are pivoting to digital means of content delivery which opens operating leverage as subscriptions grow. The secular shift of how content is consumed, including the ubiquity of mobile platforms, has led to increased competition from a wide variety of new digital content offerings, many of which are often free to users. Besides price, variables impacting customer acquisition and retention include the quality and nature of the user experience and the quality of the content offered. Competition for subscription revenue and readership is generally based upon platform, format, content, quality, service, timeliness and price, while competition for advertising is generally based upon audience levels and demographics, advertising rates, service, targeting capabilities, advertising results and breadth of advertising offerings. With advertisers shifting their budgets to digital it has been tough to offset the losses from the print side of the business. The names in this group own a set of powerful brands and have massive scale to enable an eventual successful shift to digital.

New distribution methods have completely altered the landscape for news organizations and news consumption. While social media platforms have accelerated the flow of information, there have also been significant issues with misinformation/disinformation across these platforms. While challenges exist, the news industry is also benefitting from a number of factors, namely: (1) the transition to digital and streaming which is attracting younger demos, (2) considerable viewer engagement and time spent watching and (3) streaming audiences are more open to long-form storytelling and documentaries.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, P/FCF, FCF Growth, EBITDA Growth, EBITDA Margins

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Print Media					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
NWSA	News Corp	10.8B	8.83X	12.55%	3.54%	14.12%	7.01%	6.69%	-40.82%	-0.81%	1.00X
PSO	Pearson PLC (ADR)	8.1B	9.39X	3.43%	5.26%	16.11%	#VALUE!	2.24%	23.54%	7.18%	1.19X
NYT	New York Times Co	5.7B	16.63X	10.84%	3.81%	16.57%	3.39%	14.92%	-6.09%	-1.04%	-1.27X
WLY	John Wiley & Sons Inc	2.3B	7.61X	5.05%	4.06%	24.05%	#VALUE!		-8.66%	0.48%	1.74X
SCHL	Scholastic Corp	1.3B			#VALUE!	(13.541%)	#VALUE!	6.2%	0.00%	0.00%	1.91X
RSVR	Reservoir Media Inc	0.4B	15.88X	16.45%	10.45%	35.93%	8.13%	2.62%	-5.56%	16.49%	5.48X
DJCO	Daily Journal Corporation	0.4B			#VALUE!	(16.165%)	#VALUE!	53.5%	#VALUE!	#VALUE!	34.35X
GCI	Gannett Co Inc	0.3B	5.16X	6.2%	-4.62%	7.23%	26.39%	(7.876%)	-128.89%	-4.95%	5.33X
PLBY	Plby Group Inc	0.2B	54.19X	50.34%	9.07%	1.19%	-20.15%	(6.292%)	-1432.18%	11.35%	66.01X

Management Commentary

News Corp (NWSA) on differences in advertising vs. subscription businesses…. "There's more pressure on the advertising side and the subscription side, which is why we've become more of a subscription business over recent years, and you see that both at Dow Jones and at Foxtel, but the increase in BINGE and Kayo, BINGE is the entertainment provider in Australia, and Kayo is a sports provider. They've been robust. And you've seen the growth over the past year in digital subs generally there. And we increased prices for the first time at Kayo from [$25 to $27.50] very little resistance to that. And why we've got the best sports rights in Australia, which is Australian Rules Football and NRL and Cricket and Formula One, among other things. And there are indicators we're finding in that audience of people potentially able to pay and willing to pay for business news. And the other area where we're looking across -- we're creating what we call the super segments, both for advertising and subscription fishing is the New York Post business section, which is free. But anyone who reads that on a regular basis is a potential Wall Street Journal subscriber. And that's where the cooperation and the communication within the company, which was -- as you know, because we've talked about this in the past, has been an absolute priority for me that the people learn how to talk to each other, sometimes one of the ironies of the communications industry, and we're sort of in the communications industry, is that people don't communicate with each other very much."

NY Times (NYT) on scaling…. "Even with the macroeconomic headwinds we anticipated playing out largely as we expected, we're showing the potential of our differentially valuable product portfolio and multi-revenue stream model to drive sustainable growth and profit improvement as we scale. We added 180,000 net new subscribers in the quarter with a slow start in July, a pickup in August and a strong September. The biggest story of the quarter was our continued progress on the bundle, with mounting evidence that our strategy is working. Digital subscriber revenue grew 23% in the quarter, driven primarily by successfully stepping up subscribers from promotional offers to higher prices, which continues to go well and reflects our strategy in action. We believe price increases on individual products can drive more people to take our bundle and can also help us realize more value from tenured subscribers. We saw the impact of deteriorating macroeconomic conditions, most clearly in our tech and media categories. Still, there were several areas of relative strength in a tough market, like direct sold display advertising."

OptionsHawk Executive Summary & Focus Stocks

This group lacks great investments, **NY Times (NYT)** a solid name but at 16.6X EBITDA looks way too pricey right now. I did come across one small cap of interest, **Reservoir Media (RSVR)** which owns a music catalog and offers double-digit growth and excellent margins.

Media & Entertainment – Sports, Theaters and Venues

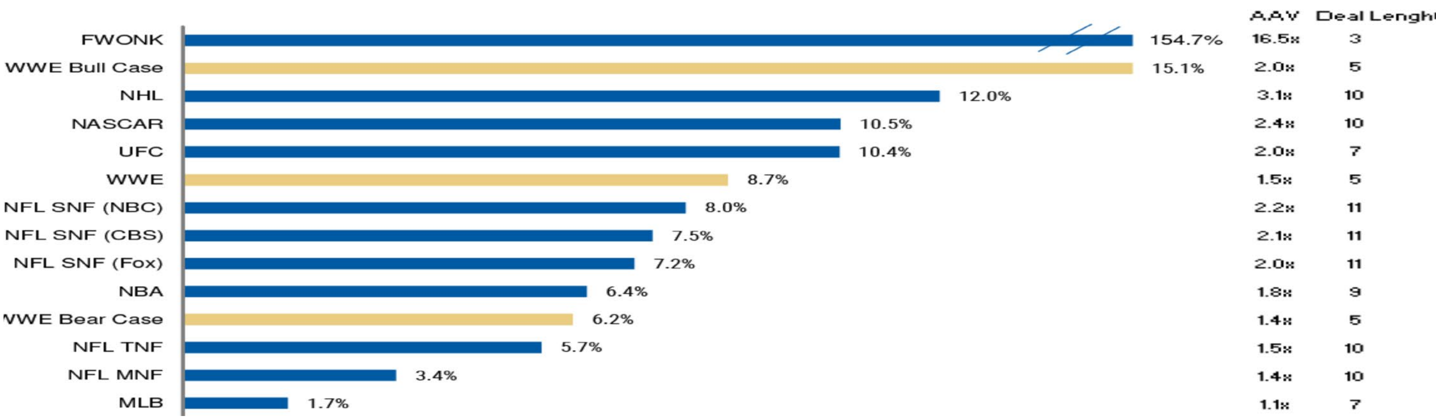
Components: BATRK, FWONA, FWONK, LYV, EDR, WWE, MSGS, AMC, BOWL, MANU, SEAT, MSGE, CNK, IMAX, MCS

International & Private Peers

Intro

The live event business is one of the last to see the benefits of the post-pandemic recovery and could face a year of normalization in 2023. However, sports rights, talent monetization, and live events are offering durable growth even in a tough macro. The stocks in this group are complex to analyze at time and there are a lot of value unlocking transactions and event catalysts taking place.

The Big Ten and Champions League renewals were at ~2.7x and ~2.5 times AAV increases, respectively, which comes after F1 has reported secured an ~16x AAV increase for its US rights with ESPN. Sponsorship spending on live events may be an underappreciated area of corporate investment in the backdrop of a softening overall ad market. Manchester United (MANU) in the news recently as it fields buyout offers and the stock has soared higher. F1's rising popularity was a key story in 2022. BATRK is being split off from Liberty Media. MSGS heads into FY23 with significant momentum thanks to strong consumer and corporate spending on premium live sports. MSGE is exploring a potential spin of the NY assets and the RSN. WWE has an upcoming rights renewal as a potential catalyst with the Street expecting a 50% increase in average annual value (AAV).



The North America box office continues to trend back towards pre-COVID levels. The film supply remains significantly depressed vs. pre-pandemic levels but is ramping up. Forecasts see 11% box office growth in 2023 Y/Y which is 75% of 2019 levels. Movie-going has historically been counter-cyclical faring well in weaker macro environments.

US Box Office	2019	2020	2021	2022E	2023E	2024E	2025E
Revenue (mm)	$11,363	$2,094	$4,483	$7,661	$8,513	$9,118	$9,672
YoY Growth	(4.5%)	(81.6%)	114.0%	70.9%	11.1%	7.1%	6.1%
Average Ticket Price	$9.13	$8.26	$9.00	$9.16	$9.48	$9.67	$9.87
Ticket Price Increase	0.2%	(9.6%)	9.0%	1.8%	3.5%	2.0%	2.0%
Attendance	1,244	254	498	836	898	943	980
Attendance Growth	(4.6%)	(79.6%)	96.3%	67.9%	7.4%	5.0%	4.0%

Industry Backdrop & Investment Considerations

Legalized sports gambling is driving upside for all sports stakeholders, providing an uplift to ratings/engagement, rights values, adv./sponsorship sales, data fees, new content creation opportunities as well as higher team franchise values. Leagues have begun to accept institutional investors which will provide an additional tailwind for franchise values. Global sports gaming industry grew at a 10% CAGR from 2017 to 2019 reaching $42B in 2019.

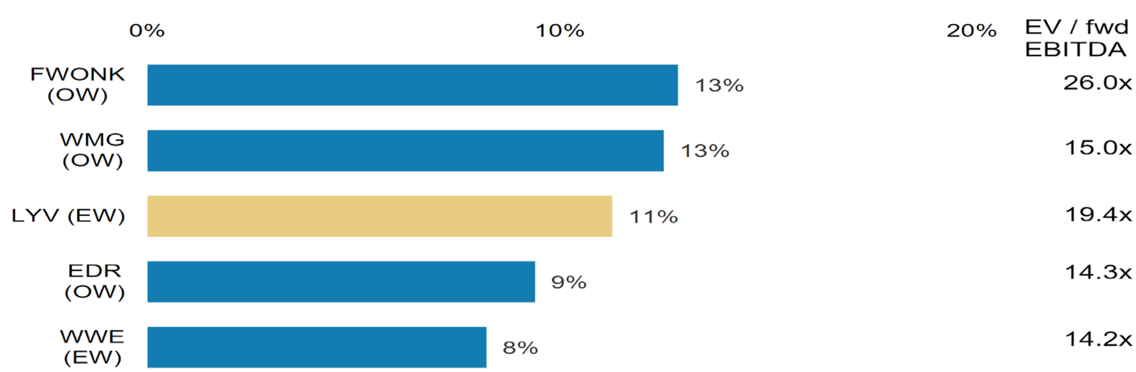
Global sports media rights spending has grown at a 9% CAGR from $32B in 2017 to $39B in 2019. The industry is expected to grow at an 8% CAGR to $53B in 2023, according to The Business Research Company, driven by continued strong demand from consumers for live sports programming, and added demand from companies interested in leveraging sports content to cross sell gaming. The sports media rights industry is becoming increasingly complex as rights become sold in more fragmented ways (e.g. broadcast vs cable vs streaming vs audio vs social) and on a more global basis. Social media has become an important part of the live events experience and business model.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, P/FCF, FCF Growth, EBITDA Growth, EBITDA Margins

Valuation and Comps

Exhibit 7: Where fundamentals remain robust - live entertainment and sports rights - EBITDA CAGR ('22-'25E) vs. EV/fwd. EBITDA



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Sports, Theaters, Venues											
BATRK	Liberty Media Corp	34.5B	995.19X	8.25%	15.26%	22.1%	#VALUE!	(2.3%)	158.70%	4.84%	2.19X
FWONK	Liberty Media Corp	34.5B	61.75X	8.25%	15.26%	22.1%	0.83%	(2.3%)	158.70%	4.84%	2.19X
FWONA	Liberty Media Corp	34.5B	63.28X	8.25%	15.26%	22.1%	1.29%	(2.3%)	158.70%	4.84%	2.19X
LYV	Live Nation Entertainment Inc	16.9B	13.17X	11.46%	8.15%	9.89%	4.82%	(60.292%)	231.92%	12.61%	0.14X
EDR	Endeavor Group holdings Inc	6.2B	5.36X	13.26%	10.41%	24.81%	#VALUE!	5.57%	-19.35%	-0.39%	3.43X
WWE	World Wrestling Entertainment, Inc.	5.5B	14.96X	12.96%	5.72%	29.94%	1.45%	25.66%	7.98%	3.24%	0.47X
MSGS	Madison Square Garden Sports Corp	3.9B	47.93X	9.92%	4.61%	(145.195%)	2.20%	79.37%	197.01%	10.48%	-1.17X
MANU	Manchester United PLC	3.5B	25.85X	33.69%	13.03%	16.43%	0.97%	(10.052%)	########	1.32%	6.24X
AMC	AMC Entertainment Holdings Inc	3.0B	59.65X	28.74%	15.10%	(1.332%)	-17.04%		61.01%	-11.86%	-88.87X
BOWL	Bowlero Corp	2.1B	10.09X	8.96%	7.12%	28.36%	4.70%	(2.208%)	27.78%	28.13%	4.41X
MSGE	Madison Square Garden Entertainment Corp	1.5B	25.63X	95.14%	21.30%	(3.762%)	-46.33%	(6.084%)	-12.05%	17.51%	-18.32X
SEAT	Vivid Seats Inc	1.5B	21.49X	21.08%	5.08%	18.04%	10.16%	(19.864%)	-538.75%	37.44%	-0.11X
CNK	Cinemark Holdings, Inc.	1.4B	9.08X	17.86%	11.05%	15.3%	11.50%	(17.249%)	-523.20%	-4.30%	4.88X
IMAX	Imax Corp (USA)	0.9B	12.39X	12.89%	17.70%	23.93%	#VALUE!	(2.198%)	-87.07%	-12.57%	1.95X
MCS	Marcus Corp	0.5B	7.85X	12.08%	10.54%	15.17%	#VALUE!	(6.274%)	-162.50%	3.63%	2.03X

Management Commentary

Live Nation (LYV) earnings call on event demand, spend trends and Venue pipeline…"Live Nation delivered the biggest summer concert season in history that drove a record quarter. These results demonstrate the ongoing and increasing demand for live events globally, with attendance in events of all sizes from clubs to stadiums. Fans around the world continue prioritizing their spend on live events, particularly concerts. Despite varying economic headwinds, including inflation, we have not seen any pullback in demand as on sales, on-site spending, advertising, all other operating metrics continue showing strong year-on-year growth. Stadiums had a particularly strong quarter with fan count more than tripling to nearly 9 million fans, driven by the global demand of top acts. As we have grown attendance, we have also continued driving greater market pricing for our concerts. And now expect to transfer over $550 million of additional payments to artists this year, continuing our efforts to help artists get the full value from their shows. And over the course of the summer, we continue to see strong on-site spend with no reduction in consumer buying habits. Ancillary per fan spending was up 20% to 30% year-to-date in our operated venues across the U.S. and Europe. The consistent theme is that fans are eager to enhance their experience, as we continue elevating our hospitality operations to provide more premium options. We still have tremendous room to expand these high-quality experiences throughout our Venue portfolio, which includes over 400 venues and festivals globally, with almost 40 new venues in the pipeline."

Endeavor (EDR) on secular industry trends…. "I want to hit on 2 of these trends, the competition for premium sports and entertainment content and the demand for live events and experiences. First, as it relates to premium sports and entertainment content, the company's strength lies in its decision we made nearly a decade ago to become a premium content supplier to the diversified and expanding list of tech and media companies who have pivoted to D2C. Alphabet, Amazon, Apple and Microsoft are in a race to add offerings across multiple categories to attract customers to their ecosystems and convince them to stay. It's undeniable that premium sports and entertainment content have become the most powerful and efficient means to acquire customers and keep them engaged. Meanwhile, as linear players battle to keep viewers, they've increasingly turned to live sports. You are seeing this play out in new deals for the NFL, Major League Soccer, Formula One, college football across linear as well as SVOD and AVOD services. Additionally, sports betting is quickly becoming the ultimate live sports viewing complement and yet another way to keep consumers engaged. During the third quarter, we closed our acquisition of sports betting tech leader OpenBet, helping round out our tech offering in this space. Beyond sports, the demand for premium talent-led content shows no sign of slowing. In fact, opportunities for talent are expanding into new formats as both Big Tech and the incumbents flight tolling top creators to their platforms. The second broad theme I want to hit is the continued consumer demand for experiences and live entertainment. The UFC has achieved 26th consecutive sellout since restarting events during COVID-19. As it relates to music and comedy tours, we continue to see strong demand. Booking shows for our talent well into 2024."

Cinemark (CNK) on the box office recovery…. "Of primary significance are sustained consumer interest in moviegoing, availability of content and the value that a theatrical release provides distributors of filmed entertainment. Based on consumer behavior over the past year, it is clear that moviegoing enthusiasm remains strong and vibrant across all categories of films and audiences. We've now seen this validated quarter-after-quarter genre by genre as long-standing records have been broken and films have performed at levels comparable to or better than pre-pandemic expectations, even during periods of heightened COVID concerns. When compelling content is released, consumers are flocking to theaters to see it. That said, the biggest near-term challenge our industry continues to face is content availability. As we look forward, while we expect 2023 will continue to be another year of recovery with regard to overall content volume, our early projections indicate it will be a further step forward from 2022, much like 2022 was from 2021."

OptionsHawk Executive Summary & Focus Stocks

World Wrestling (WWE) has been a strong performer and the upcoming AAV rights renewal could be a major catalyst and increase earnings power while also being seen as a likely M&A target. **Manchester (MANU)** rallied sharply in December with multiple interest acquirers as well. **Endeavor (EDR)** is a preferred name in this group with strong growth and high margins while **Live Nation (LYV)** is too risky with current headlines and potentially a forced breakup. **Vivid Seats (SEAT)** actually screens fairly healthy and a name I could see as a buyout play while **Bowlero (BOWL)** has been a favorite small cap this year with its strong results and a long runway for acquisitions. I can also make a bullish case for theaters with a stronger 2023 box office and **Cinemark (CNK)** the best name in that grouping.

Media & Entertainment – Videogames

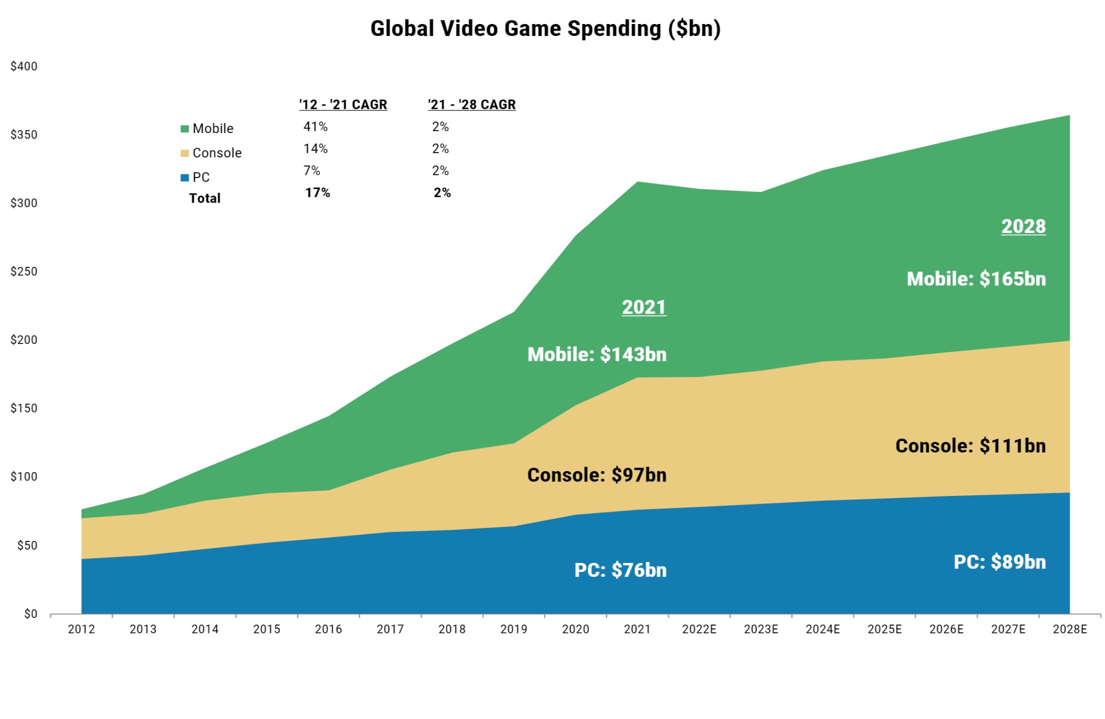
Components: ATVI, NTES, EA, RBLX, TTWO, BILI, PLTK, SCPL, MYPS, DDI, DOYU, GRVY

International & Private Peers: Nintendo, Sony, Tencent, Ubisoft

Intro

Consolidation has been a major theme in this group for many years and Microsoft is now trying to acquire Activision, though a deal may not make it past regulators. The industry has faced tough post-pandemic compass that weighed much of 2022 and the focus now on the upcoming game pipeline. AAPL's ATT/IDFA changes on iOS were a source of significant disruption over the last 18 months as well for mobile.

Mobile gaming remains an area of growth and is less lumpy than PC/Consoles but has seen some recent weaker growth numbers from in-app purchases. The strong growth from mobile, which led overall industry growth for the past decade, is clearly showing signs of slowing due to saturation. Consumer spending on PC/console gaming has been notably resilient through past recessions. Publishers will be pushing out more titles in 2023 and there is a higher installed base for next-gen consoles. Global video game stocks have gone through a consistent downward trend in valuations since peaking in early '21 with the average multiple trading near 7-year lows on forward P/E and 5-year lows on EV/EBITDA.



Industry Backdrop & Investment Considerations

The video games market was approximately $175B in 2020, marking a 13% 3-year CAGR (2017-20), and is projected to grow at an 8% 3-year CAGR (2020-23), according to Newzoo. Mobile gaming is the fastest growing component within the video games industry, according to Newzoo. Driven by the expansion of mobile broadband and the proliferation of smartphones, games today can be enjoyed whenever and wherever players want. According to Newzoo, approximately 2.5 billion users spent time and money on mobile games in 2019 and mobile gaming revenue is expected to grow to approximately $114.4B in 2023, representing a compound annual growth rate of 9.8% from $86.3B in 2020. This should be driven by continued growth in the installed base of smartphone and tablet devices as well growth in the number of gamers. The global adoption of smartphones, coupled with increasingly powerful 5G networks and cloud-based infrastructure, has fueled rapid growth in mobile gaming, allowing the industry to scale rapidly at a low marginal cost.

The social casino market reached $6.3B in 2020E, growing at a 13% CAGR from 2015 to 2020 and is expected to grow at a 5% CAGR through 2023. Growth in the social casino industry in recent years has been largely driven by growth in average revenue per daily active user (ARPDAU), which has been more than offsetting declines in daily active users (DAUs). APAC continues to hold the majority share of the video game industry revenue, accounting for 48% of the market in 2020, with North America holding second place with a much lower share of 19%.

Proxies for video game engagement continue to reach new record levels as seen with Twitch and Steam viewership and in-game player count numbers. Current and future growth drivers include new ways to play (multi/cross platform, streaming), pay (full price, free-to-play, and subscription) and engage (esports and live streaming).

As gaming capabilities expand into new form factors and devices (such as Virtual Reality and Augmented Reality) new experiences evolve and monetization models are unlocked, such as subscriptions, audience/spectator microtransactions, and cloud-gaming. While younger users still comprise the majority of gamers, we expect that as they age, an increased proportion of the global population will want to play video games. This structural change will allow for increased advertising attention to new forms of media, including esports, video streams, and the games themselves.

eSports have been around for as long as the video game industry itself, and collectively refer to competitive video game play by professional and amateur gamers. But in recent years, growth in the gaming audience and player engagement has elevated eSports into mainstream culture as a legitimate professional sport with a massive global following. Advertising has the potential to be a $2B market for console gaming.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, P/FCF, FCF Growth, EBITDA Growth, EBITDA Margins

Valuation & Comps

EV/EBITDA to FCF Margin

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Videogames					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
ATVI	Activision Blizzard Inc	60.3B	17.47X	9.16%	18.74%	36.64%	3.47%	24.47%	-14.53%	-4.71%	-2.76X
NTES	NetEase Inc (ADR)	47.9B	10.79X	13.14%	8.08%	22.33%	#VALUE!	20.96%	35.67%	10.30%	-3.84X
EA	Electronic Arts Inc	34.4B	12.31X	5.91%	6.59%	32.88%	5.00%	32.34%	2.80%	3.11%	-0.11X
RBLX	Roblox Corp	19.9B	65.99X	36.18%	14.04%	9.83%	0.18%	44.03%	79.89%	-6.62%	-10.12X
TTWO	Take-Two Interactive Software Inc	17.6B	19.63X	60.68%	28.12%	22.31%	3.32%	29.64%	-18.50%	58.79%	1.59X
BILI	Bilibili Inc - ADR	9.6B	-14.38X		21.18%		-1.24%	(25.345%)	24.89%	12.99%	
PLTK	Playtika Holding Corp	3.3B	4.95X	8.91%	2.13%	35.61%	#VALUE!	38.78%	-31.87%	-7.83%	1.28X
SCPL	SciPlay Corp	2.0B	11.57X	8.07%	6.06%	25.06%	#VALUE!	(8.489%)	-2.06%	-0.10%	-1.80X
MYPS	Playstudios Inc	0.5B	8.66X	33.68%	6.92%	13.53%	144.68%		1250.00%	-10.38%	-5.54X
DDI	DoubleDown Interactive Co Ltd	0.5B	1.93X	2.48%	1.58%	31.73%	#VALUE!	11.62%	-134.19%	-11.41%	-2.61X

Management Commentary

Electronic Arts (EA) on strength of its sports franchises…. "Now more than ever, Madden NFL is deeply ingrained into the fabric of NFL fandom, reaching broader entertainment audiences. With the sport of F1 continuing its growth trajectory, especially in the U.S., we are well positioned to expand the total addressable market for our F1 franchise. We have more than 200 million players engaged in our EA SPORTS games. As we look to the future of FC, Madden NFL, F1, NHL, UFC, PGA Tour and more, we will continue growing these ecosystems to reach new fans, expand to new experiences and create more social connectivity to fuel the enjoyment of sport. EA delivered strong engagement and deeply immersive experiences across our portfolio with new EA SPORTS titles and multi-platform live services powering the business. We have a deep slate of new titles set for the second half of the year. Entertainment is a fundamental human need. And in this dynamic environment, we are focusing on our strengths, providing amazing games and live services that inspire the world to play. So as we think about the 4 key vectors of opportunity for us, play, create, watch and connect. The first thing to -- as we look at existing network of players, over 600 million, as we look at new onboarding players in the kind of Gen Z and Gen Alpha populations, what we discover is the first thing that they are expecting from us is that we expand play."

Take Two (TTWO) on growing in 2023 despite recent guidance cuts… "It's driven by the pipeline, of course. So we know what the release schedule is and we feel really good about it. And if we didn't, we wouldn't call for a sequential growth and record results in the next 3 years. But I understand the frustration. And look, we call it as we see it and I think we're known for that. Had we expected where we were right now, then we wouldn't be guiding down. We're guiding down because things have materialized in a way that's different than our expectations. Some of that is related to pipeline, but frankly, not most of it. Most of it's related to mobile, significant amount of FX as well. But there have been some modest pipeline shifts. The good news is those titles are, of course, coming. The mobile advertising business, look, these are 2 different businesses and the vast majority of our net bookings at Zynga comes from in-app purchases still. So yes, we expect the growth rate in advertising probably to exceed the growth rate in in-app purchases, certainly for the next year. Beyond that, I think it's too early to say."

OptionsHawk Executive Summary & Focus Stocks

After being a clear group to avoid in 2022 coming off the 2021 comps the videogame names are starting to look attractive again and is a resilient industry for consumer spend. **Electronic Arts (EA)** is a clear value at 12X EBITDA while offering top margins and ROIC. **Take Two (TTWO)** still trades a bit rich but should be entering a strong pipeline period to drive beat and raises. As an industry seeing plenty of consolidation, **SciPlay (SCPL)** looks to be a nice acquisition target in mobile/social games.

Restaurants – Quick-Service

Resources: QSR Magazine, NRA

Components: MCD, SBUX, CMG, YUM, YUMC, QSR, DPZ, BROS, WING, WEN, PZZA, DNUT, SHAK, SG, JACK, PTLO, ARCO, LOCO, NDLS

International & Private Peers

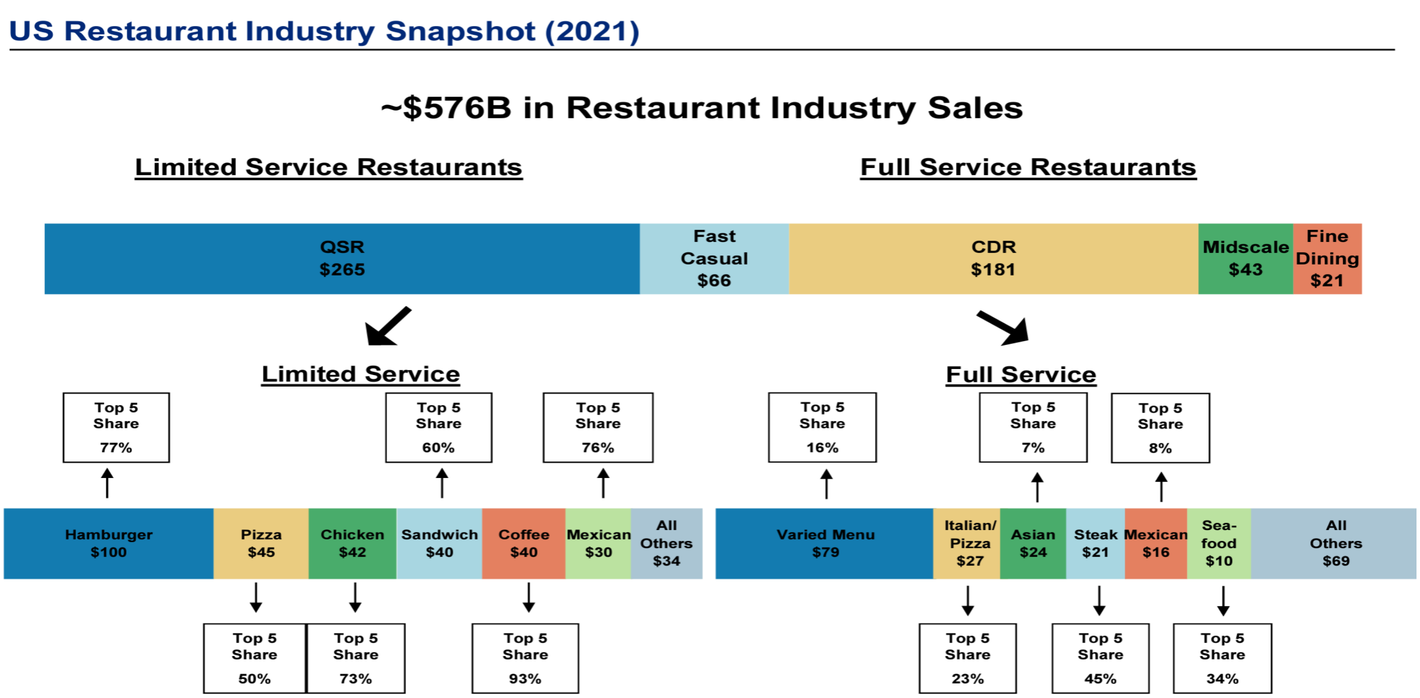
Intro

The major quick-service plays showed relative strength much of the year as a return to dining out continued and consumer spending was strong. They also managed well through inflationary pressures which could be a boost in 2023 as commodities move lower while wage pressure is another key topic. However, many of these companies are set for structurally higher margins due to digital investments. Industry comps have generally proven more resilient than might be expected. Moderating commodities inflation would provide a meaningful offset to potential demand retrenchment. Moderating commodities inflation would provide a meaningful offset to potential demand retrenchment. Large cap Quick-service restaurants are both more insulated from inflationary costs due to their franchise model and more insulated from economic cyclicality. QSR chains returned to modest unit growth in 2021 after shrinking 2.5% in the prior year and seen growing 1.1% in 2022 and 1.5% in 2023.

Industry Backdrop & Investment Considerations

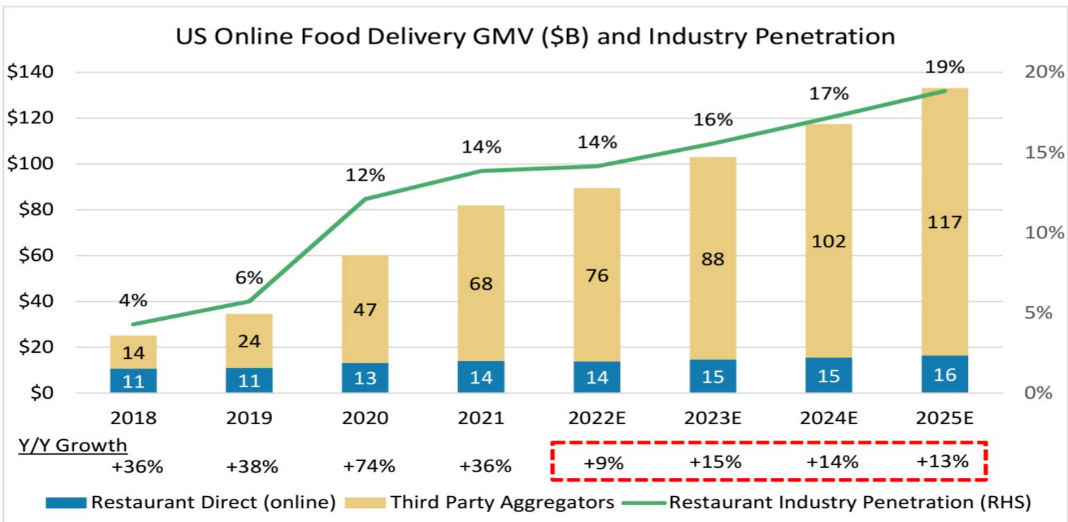
US consumers spend $1.6 trillion on food annually with $600B spent at restaurants and growth has outpaced that of overall retail sales growth. The fast-food market size was valued at $647.7 billion in 2019 and is estimated to reach $931.7 billion by 2027, growing at a CAGR of 4.6% during the forecast period. Knapp Track is a great provider of monthly insights on traffic, tickets and sales. We look at metrics such as same store sales growth, average tickets, foot traffic, sales per square foot, current ratios, inventory turnover, and unit growth outlooks.

Five significant macro drivers for restaurant sales: 1) disposable personal income, 2) non-farm payrolls, 3) inflation of food-at-home, 4) gas prices, and 5) consumer sentiment.



The US restaurant industry is composed of over 700k locations, roughly evenly split between limited-service (fast food/fast casual) and full-service (dine-in), per Euromonitor data. While the total number of restaurant units is split ~50/50 there is a sharp disparity between limited-service and full-service segments as it relates to market concentration. The limited-service industry is highly concentrated, with restaurant concepts within the top 500 US chains accounting for almost 85% of the total US limited service industry sales. On the other hand, full-service restaurants are far less concentrated with chains within the top 500 accounting for less than 30% of industry sales.

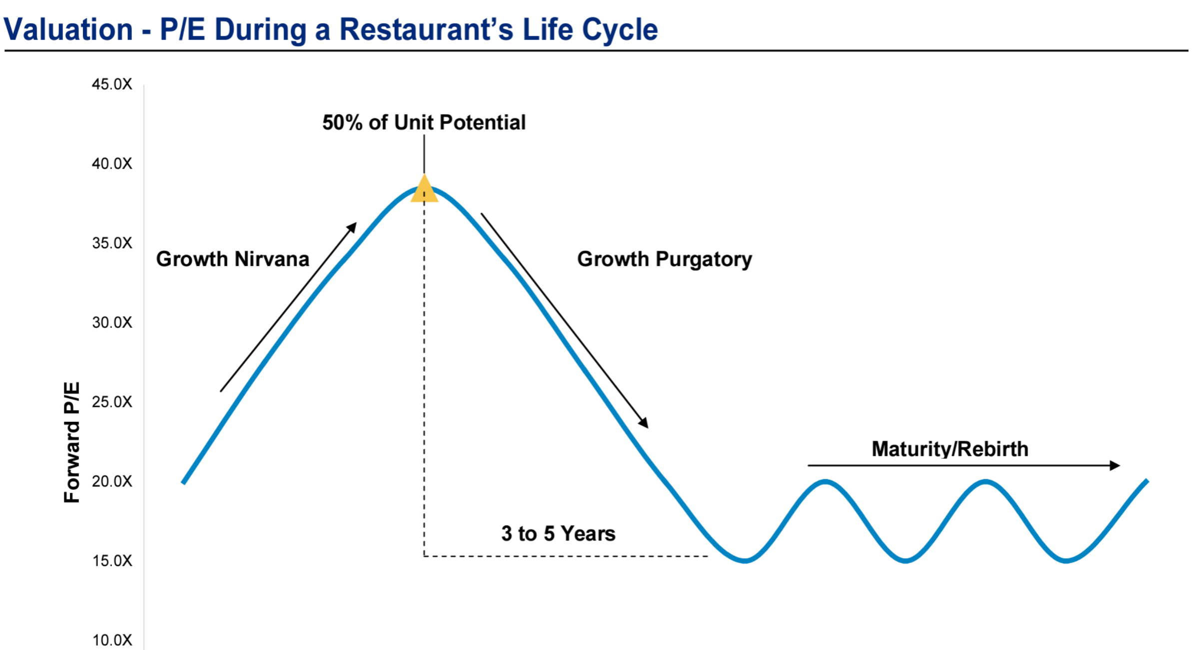
The industry has several other emerging themes such as expanding the global footprint via virtual, host and ghost kitchens. Third-party delivery and curbside pickup will remain key themes. Loyalty programs are cited as the #1 reason consumers use online ordering platforms.



Indicators, Metrics & Stock Selection Framework

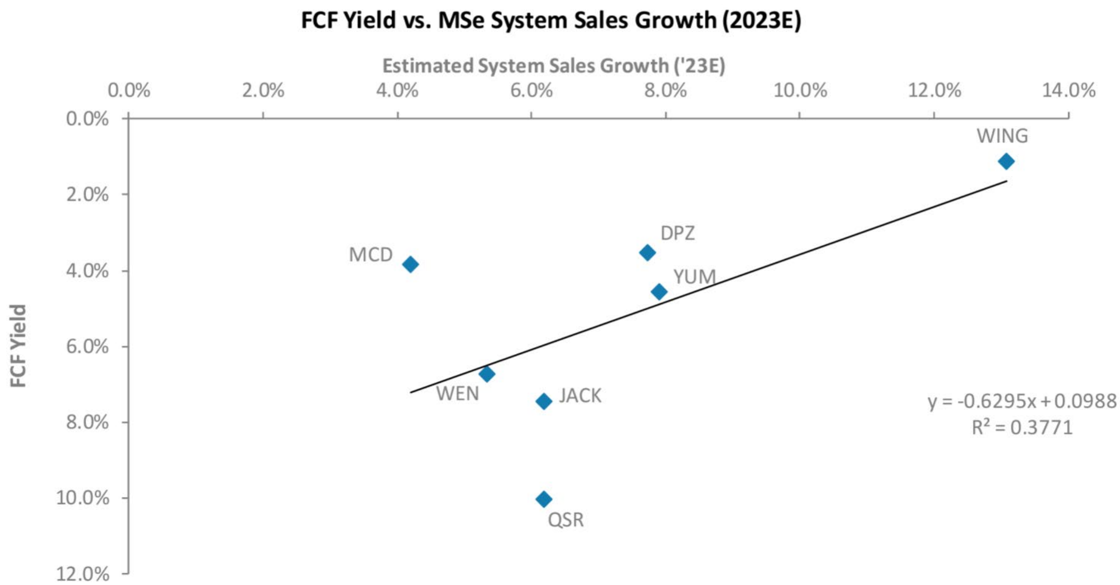
Inventory Turnover, Sales/Sq. Foot, Current Ratio, Unit Growth, EV/EBITDA

FCF is preferred for mostly franchised concepts as FCF better captures capital intensity for shareholder returns.



__Valuation & Comps__

Expectations for combined SSS and unit growth drive forward valuations in this group (R^2 0.75). Growth concepts P/E range is 25x-35x+, while more mature concepts typically trade between ~8x-25x next-twelve month estimates. Valuation also dependent on company/franchise mix, with all or near-all franchised businesses trading at higher valuations relative to company owned businesses.



Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	Inventory Turnover	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Quick-Service					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
MCD	McDonald's Corp	201.1B	19.50X	4.81%	2.72%	55.0%	2.88%	223.85%	-1.68%	-6.91%	2.51X
SBUX	Starbucks Corporati	117.3B	18.35X	13.93%	10.87%	19.95%	2.78%	5.03%	1.49%	9.64%	1.77X
CMG	Chipotle Mexican Gı	42.6B	27.92X	18.28%	13.49%	18.68%	1.79%	212.97%	5.21%	0.22%	-0.47X
YUM	Yum! Brands, Inc.	37.0B	20.75X	8.93%	5.65%	34.39%	3.45%		-9.00%	-4.68%	4.96X
YUMC	Yum China Holdings	23.9B	15.46X	17.33%	14.05%	17.69%	#VALUE!	9.34%	-28.67%	-11.59%	-2.00X
QSR	Restaurant Brands Iı	35.1B		7.16%	3.73%	37.2%	#VALUE!	20.25%	4.49%	3.14%	4.83X
DPZ	Domino's Pizza Inc	12.8B	20.97X	8.75%	3.97%	18.28%	2.49%	38.48%	-15.77%	-1.24%	6.17X
BROS	Dutch Bros Inc	5.2B	62.92X	38.22%	33.40%	14.01%	-1.70%	17.09%	-51.22%	2.26%	2.98X
WEN	Wendys Co	5.0B	15.59X	5.53%	4.35%	25.25%	2.85%	128.22%	-5.56%	-1.65%	5.07X
WING	Wingstop Inc	4.8B	51.75X	18.13%	17.83%	30.64%	1.06%		6.15%	-4.43%	4.81X
PZZA	Papa John's Int'l, Inc	3.1B	17.75X	7.3%	4.16%	9.19%	1.23%	35.73%	-21.89%	-4.04%	2.77X
DNUT	Krispy Kreme Inc	2.4B	17.65X	15.88%	10.16%	10.21%	1.96%	20.84%	-27.50%	-2.05%	4.70X
SHAK	Shake Shack Inc	2.1B	31.66X	28.34%	20.95%	8.58%	-1.24%	68.19%	125.79%	-5.07%	-1.24X
ARCO	Arcos Dorados Hold	1.6B	5.31X	7.84%	5.46%	11.14%	#VALUE!	73.53%	215.79%	34.06%	1.09X
JACK	Jack in the Box Inc.	1.4B	10.15X	6.79%	1.46%	19.33%	10.10%	141.16%	-15.22%	43.59%	5.60X
PTLO	Portillos Inc	1.5B	23.79X	8.97%	14.13%	14.31%	0.05%	36.9%	82.61%	-1.21%	3.13X
SG	Sweetgreen Inc	1.2B	-18.10X		33.11%	#######	#VALUE!	300.57%	10.07%	-9.26%	14.50X
LOCO	El Pollo LoCo Holdin	0.4B	8.86X	1.41%	4.20%	9.65%	#VALUE!	113.82%	-21.74%	1.16%	0.11X
NDLS	Noodles & Co	0.3B	8.89X	26.69%	7.59%	7.56%	#VALUE!	38.95%	-111.54%	1.16%	0.97X

__Management Commentary__

Starbucks (SBUX) Investor Day on new growth era, expansion, and margins…"Now as Howard teased in the beginning, and as we've shared throughout today in the details, the reinvention plan is set to support a new era of growth. What does new era mean? Simply put, it means accelerated earnings growing to 15% to 20% annually over the next 3 years. Come on, you got to be on the edge your seat. 15% to 20% annually over the next 3 years, up from our previous guidance of 10% to 12%, that's our new era of growth. Our building blocks can be summarized into 4 key drivers that collectively support our company's earnings growth. They are: number one, comp growth; two, store growth; three, margin expansion; and finally, disciplined capital allocation. Our reinvention plan was specifically designed to accelerate each and every one of these building blocks leading to accelerated earnings growth. Because our path forward prioritizes investments that accelerate our revenue growth through efficiency and unlocked capacity across the globe. We also see tremendous opportunity to be able to expand across the globe outside of markets like U.S. and China. Our margin is a function of pluses and minuses that, together, net to accelerated growth. We expect an outsized impact on the plus side of the equation driven by sales leverage from the accelerated revenue growth inclusive of strategic pricing, improved turnover, efficiency in our stores and labor leverage. Now we also expect headwinds related to supply chain and commodity pressures, inflationary pressures, to continue with a potential opportunity for a tailwind in the future if rates decrease."

McDonald's (MCD) on digital…. "Digital is a primary driver to improve the customer experience, reduce complexity and drive profitability. In our top 6 markets, it now represents over 1/3 of system-wide sales, fueled by over 43 million active customers on our app in the third quarter. In the U.S., our digital business is powered by over 25 million active customers driven through my McDonald's rewards. Our loyalty program is driving growth and exceeding expectations. Delivery also remains a key driver of our business to enhance convenience, we're integrating a new feature where customers can earn loyalty points order and pay for delivery within the McDonald's app. The streamlined and more rewarding experience is available to customers in the U.K. and is currently being rolled out in the U.S. Further implementation of this solution will only enhance our strong performance as the third quarter was one of our highest delivery sales quarters ever in the U.S. Chicken is a strong growth driver of comp sales in the quarter across our major markets and will remain a focus for us as we continue to grow our global market share in this important category."

Chipotle (CMG) on small town opportunity and delivery pricing…. "In the U.S., our small town strategy is also performing very well. Overall, small town restaurants have comparable margins and returns to the company average, and we're excited about the growth opportunity, which is included in our 7,000 long-term restaurant target. I'm also proud to share that opening day sales for a restaurant in a small town in Texas was a new company record. One is, remember, we're pricing -- we've got higher menu prices for our delivery business. Our delivery business is about 17%, 18% of our business. And so we actually resin charging fees. We charge virtually no fee. We charged $1 fee than plus a small commission. So our menu prices are much higher there. So that gives you what appears to be a much lower food cost, all right? So you get a benefit on the food line. The other thing when we talk about inflation over the last 2 years, food inflation has been about 20%, but labor inflation has been more like 24%. So any time we take price increase to cover labor when labor is inflating at a higher rate than food cost, again, you get some of that benefit in the food cost."

OptionsHawk Executive Summary & Focus Stocks

The large cap names all trade near 20X EBITDA but **Starbucks (SBUX)** stands out with solid top and bottom-line growth after an impressive Investor Day and will benefit from further mobility trends. **Chipotle (CMG)** remains the best-in-class growth name though it does come at a 40% valuation premium. CMG continues to absolutely smash estimates and execute flawlessly in all environments. **Dominos Pizza (DPZ)** still looks rich on valuation with comps slowing which can result in further downside. In the next market cap tier **Wendy's (WEN)** is a likely buyout play while two of the strongest growth stories are **Dutch Bros (BROS)** and **WingStop (WING)** and both carry monster premium multiples. I prefer WING which has been a favorite for many years and already at 30%+ margins. For the smaller names **Arcos Dorados (ARCO)** looks very cheap at 5.3X EBITDA with solid growth while **Shake Shack (SHAK)** a strong growth name but trades very rich and lacks the same kind of profitability as WING, so a likely short.

Restaurants – Casual & Full-Service Dining

Resources: Fast Casual,

Components: DRI, TXRH, CBRL, BLMN, PLAY, AKE, CNNE, EAT, DIN, FWRG, BJRI, DENN, RUTH, CHUY, BH

International & Private Peers

Intro

The casual dining names have a similar backdrop to quick service as 2023 looks to moderating demand along with moderating inflation. Some individual stories continue to play out with consistent favorite TXRH sitting right back near record highs. A relief to margin pressures will be the focus for investors in 2023 while also watching for comps to hold up.

Industry Backdrop & Investment Considerations

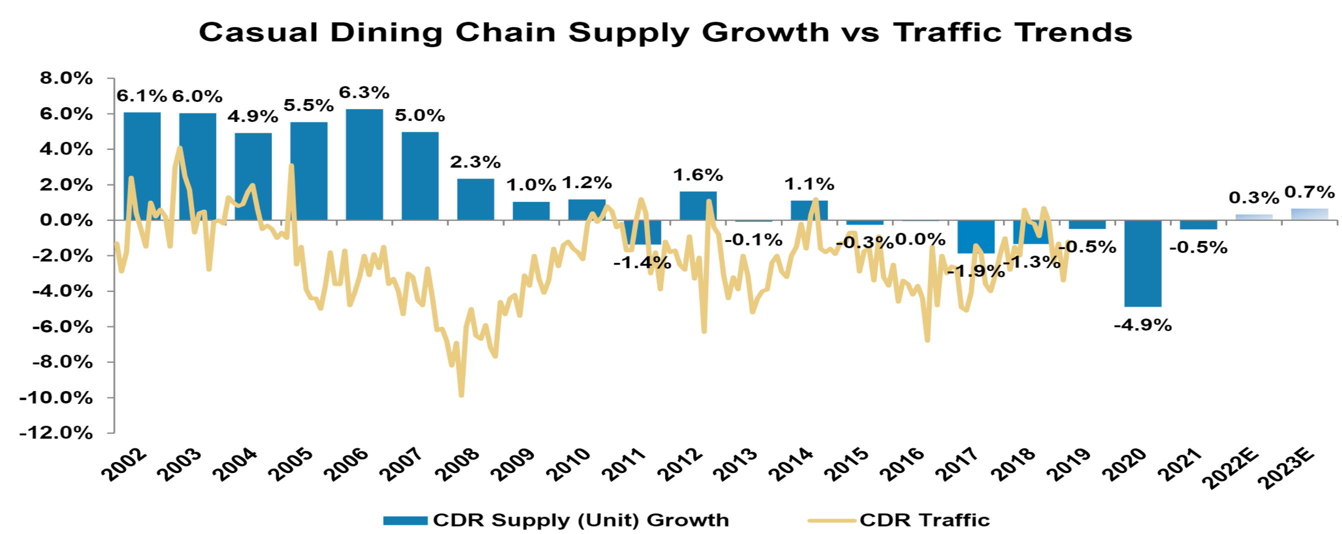
The US restaurant industry includes about 570,000 restaurants with combined annual revenue of about $600B. The full-service is a $300B segment that is very fragmented with large chains accounting for 30% of sales and 8% of total units.

Fast Casual has seen outsized growth taking market share and expectations for $210B in revenues by 2027 at a 10.6% CAGR. Fast-casual restaurants give casual-dining consumers an opportunity to trade down to lower-priced yet high-quality fresh food. At the same time, they allow quick-service customers to trade up to a “third place” environment that offers affordable food quickly at a cost that is usually only a few dollars more than typical fast food. In terms of ownership structure, among the top 150 fast casual chain restaurants, 47 percent of the units are company owned and 53 percent are franchised.

Digital Transformation, Unit Economics, and Market Share Opportunities are three key themes. Rapid digital acceleration in the restaurant industry and broad adoption of both off-premise channels and technology integration will be key for restaurant concepts as they look to capitalize on secular shifts in consumer behavior and work to offset higher costs inside the restaurant through automation, more efficient service models, and more effective 1x1 personalized marketing capabilities.

Indicators, Metrics & Stock Selection Framework

Inventory Turnover, Sales/Sq. Foot, Current Ratio, Unit Growth, EV/EBITDA. Expectations for combined SSS and unit growth drive forward valuations in this group (R^2 0.75)



Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	Inventory Turnover	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Casual Dining					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
DRI	Darden Restaurants, Inc.	17.6B	12.32X	8.39%	5.73%	13.69%	5.47%	29.32X	4.33%	7.75%	1.17X
TXRH	Texas Roadhouse Inc	6.7B	13.98X	13.61%	10.18%	10.97%	3.30%	42.27X	10.27%	2.97%	-0.25X
CBRL	Cracker Barrel Old Country Store, Inc.	2.2B	9.96X	15.06%	4.58%	6.53%	0.60%	5.07X	-17.29%	5.59%	1.88X
BLMN	Bloomin' Brands Inc	1.9B	5.02X	2.92%	5.31%	8.85%	#VALUE!	16.27X	3.33%	2.54%	1.92X
PLAY	Dave & Buster's Entertainment Inc	1.7B	6.25X	19.6%	21.25%	16.32%	8.24%	6.60X	-18.37%	19.38%	3.58X
CNNE	Cannae Holdings Inc	1.7B	-8.46X	(42.861%)	0.64%	(9.483%)	#VALUE!		-1205.15%	-22.72%	2.05X
EAT	Brinker International, Inc.	1.6B	7.59X	16.89%	3.65%	2.84%	9.50%	98.90X	-27.14%	5.88%	9.30X
DIN	Dine Brands Global Inc	1.1B	8.76X	4.25%	-10.36%	27.27%	7.55%		-1.61%	-2.74%	4.35X
FWRG	First Watch Restaurant Group Inc	0.9B	13.12X	12.12%	17.01%	9.11%	0.07%	73.51X	-11.76%	5.57%	0.74X
BJRI	BJ's Restaurants Inc	0.7B	10.03X	10.83%	4.16%	4.87%	#VALUE!	68.82X	-350.00%	17.50%	0.35X
DENN	Denny's Corp	0.6B	11.45X	(13.627%)	1.99%	16.34%	6.26%	18.05X	-29.58%	5.59%	3.04X
CHUY	Chuy's Holdings Inc	0.6B	9.80X	7.75%	8.73%	10.98%	1.38%	68.97X	-28.57%	-2.14%	-1.92X
RUTH	Ruth's Hospitality Group Inc	0.6B	7.51X	2.21%	7.77%	12.72%	#VALUE!	42.05X	-5.73%	4.07%	0.04X
BH	Biglari Holdings Inc	0.4B			#VALUE!		#VALUE!	60.14X	0.00%	#VALUE!	

Management Commentary

Darden (DRI) on slower on-premise traffic…. "Yes, I think a couple of things. The off-premise experience is a lot better across a lot of places. So people have other ways to get their food from Casual Dining than they did before. And so that could lead to a little bit less dining room traffic especially as there are still some consumers that don't want to go out to eat. While a lot of people think COVID is over, there are some that don't. The good news is if we -- if our dining rooms aren't back to full, we've got capacity. And as we continue to see some improvement, as we continue to do the things that we have been doing over the last few years, focusing on simplification, making it easier for our teams to do what they do, investing in our food, investing in our teams, then we're going to have an even better experience as guests come back, and they are coming back. So that just gives us more opportunity to grow in the long run because our dining rooms in some of our brands aren't back to pre-COVID levels, that's being offset in most of our brands by To Go."

Texas Roadhouse (TXRH) on demand holding up in 2023…. "I think for us, it's still moving forward. It's focused on driving top line sales and feeling like we have a lot of opportunity to do so. The To-Go transaction stays very sticky and looks like it's holding, along with those dining room sales going up. So that normal seasonality seems to have come back in play that we talked about in July. So we're expecting a very great holiday season heading into the fourth quarter and -- high gift card sales heading into the new year, a lot of redemptions from that perspective, which are always great things. So I think overall, we would say we feel very confident in our ability to continue to drive sales in a positive way."

OptionsHawk Executive Summary & Focus Stocks

Texas Roadhouse (TXRH) is far and away the standout name here delivering double digit growth while strong across all key metrics. In the $1B to $2B market cap range **Dave and Busters (PLAY)** Is still seeing a post-pandemic strong recovery with impressive growth yet just 6.25X EBITDA and leading margins. **First Watch (FWRG)** is a small name I believe can do very well over the long-term as it expands operations.

<u>**Business Services – Advertising & Marketing**</u>

Components: OMC, IPG, WPP, CNXC, OUT, TTEC, DLX, CCO, CMPR, PBI, QUAD

International & Private Peers: Publicis, Dentsu, Havas, Hakuhodo

Intro

There are outdoor advertising names (OUT, LAMR, CCO, JCDecaux) utilizing billboards, posters and signs outside of home. The customer engagement solutions group is highly fragmented with ATTO, TTEC in this group and competes with leaders like Teleperformance, Concentrix (SNX), Alorica, and Sitel. CMPR is a niche player capitalizing on the trend of mass customization.

The group, for the most part, sold off sharply in 2022 with a weakening outlook for advertising spending overall but the larger agency plays OMC and IPG held up rather well posting strong organic growth though the companies are expecting deceleration with Macro risks in 2023. Organic growth has been led by healthcare, media, experiential solutions and PR. Strength in media at the agency holdco's contrasts with continued softness at some publicly held digital media businesses. The digital media landscape is increasingly competitive and fragmenting and agency holdco's service global, multi-national, corporations and do not play in the SMB market that represents a major element of digital media spend in the US, notably on social media platforms. The Agency names also have more diversified revenue bases and longer duration client contracts, insulating them from the volatility seen with the digital names. Agencies still face structural issues and with organic growth set to come lower it may be a struggle to see more upside in 2023 as macro leading indicators and comments from key advertisers suggest a weakening outlook.

Industry Backdrop & Investment Considerations

The business of advertising agencies is truly a global business, with 4 large holding companies – WPP Group, Omnicom, Publicis and Interpublic (the Big 4) – accounting for nearly 70% of worldwide agency revenue. The Ad Agency market is estimated to be around $60B in 2021 and has grown at a 3% CAGR the last five years. The more mature print advertising industry is dominated by just a few players while moving towards a digital transformation and data-driven marketing solutions.

The U.S. advertising and marketing services industry includes about 38,000 establishments (single-location companies and units of multi-location companies), with combined annual revenue of about $105 billion. The customer engagement solutions and services industry, which includes services such as digital marketing and demand generation, customer acquisition, customer support, customer retention and automation, is highly fragmented and significant in size.

Clients are increasingly expanding the focus of their brand strategies from national markets to pan-regional and global markets and integrating traditional and non-traditional marketing channels, as well as utilizing new communications technologies and emerging digital platforms. The legacy agencies must reinvent themselves and pivot towards digital transformation and data.

Competition in both the advertising and marketing services and print industries is affected by real gross domestic product growth, as economic activity and advertising spending are key drivers of consumer demand. In times of economic prosperity, advertisers may increase spending to build brand awareness and to drive sales. Conversely, in times of global economic uncertainty and budget pressures, advertisers may reduce spending or shift their spending to other forms of media.

Indicators, Metrics & Stock Selection Framework

EBITDA Margins, Revenue Growth, EV/EBITDA

Organic revenue growth and operating margins are the two drivers of fundamentals. Ad agencies typically have limited operating leverage as faster revenue growth typically equates to higher headcount and higher personnel costs.

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Advertising & Marketing					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
OMC	Omnicom Group Inc.	16.5B	8.28X	5.34%	-1.72%	17.42%	9.20%	22.03%	1.42%	-2.47%	0.92X
IPG	Interpublic Group of Companies Inc	13.0B	7.99X	6.55%	-1.18%	17.55%	7.39%	17.47%	1.48%	-0.59%	0.67X
WPP	WPP PLC (ADR)	11.0B	6.02X	5.19%	2.76%	12.95%	#VALUE!	22.69%	7.22%	7.66%	2.35X
CNXC	Concentrix Corp	6.5B	8.46X		5.82%	16.36%	#VALUE!	15.73%	-0.86%	-2.49%	2.11X
OUT	Outfront Media Inc	3.0B	11.85X	8.3%	9.56%	27.15%	#VALUE!	1.01%	7.88%	0.80%	5.12X
TTEC	TTEC Holdings Inc	2.2B	9.45X	10.42%	4.69%	12.19%	#VALUE!	18.91%	-26.86%	-6.67%	2.68X
DLX	Deluxe Corporation	0.8B	5.81X	9.99%	1.66%	18.85%	#VALUE!	9.03%	-16.08%	1.36%	3.89X
CMPR	Cimpress PLC	0.7B	7.86X	23.36%	9.15%	6.48%	21.30%	(5.184%)	-123.27%	9.00%	7.70X
PBI	Pitney Bowes Inc.	0.7B			0.09%	9.3%	#VALUE!	1.82%	-48.65%	-5.24%	5.25X
CCO	Clear Channel Outdoor Holdings Inc	0.5B	10.59X	11.41%	3.64%	21.48%	-2.68%	(21.785%)	164.29%	-5.87%	
QUAD	Quad/Graphics Inc	0.2B			#VALUE!	8.04%	#VALUE!	1.75%	0.00%	0.00%	2.62X

Management Commentary

Omnicom (OMC) on its changed portfolio…." Our portfolio today isn't comparable really to when our portfolio was 3.5, 4 years ago. That -- the instances you referred to, 2019, 2020 was the end of a 5-year period in which we were disposing things. That contributed to our profit, but didn't necessarily contribute to our growth. And we were able, in good times, to find buyers who are interested in those companies, and we offloaded them. Similarly, we made investments in areas where we believe that growth would be consistent in good times and in bad -- you can see that reflected in our precision marketing assets, you can see that in the changes that were made in our public relations category and also the expansion of services in the health area. So as well as more traditional areas, we cleaned up low growth geographies and/or what we felt were product loans. It's a process which has served us well. It will continue to serve us well, I believe, as we face more challenging times if they come and we're planning that more challenging times aren't -- we're facing more challenging times because of inflation and some of the macro factors that are out there in the marketplace."

Interpublic (IPG) on media shift and its positioning…. "The data shows that for a company to continue to spend through a downturn, they wind up being stronger and better and that you really need to keep your share of voice amongst your market share. We're U.S. heavy, which we think is a strength, but if you look regionally, we've done very well in Lat Am and what we call other, which is Canada, the Middle East and Africa. I would say that there's a bit of share shift. There's more fragmentation coming on with more players and more choices, whether it's the advent of retail media coming, connected TV. And so I think there is share strip, there's further fragmentation. And then also their clients tend to be more small and midsized enterprises where we skew to larger multinational clients. So we have our media business that's done extremely well. It's growing, it has been growing, it is accretive. And we're very excited. We think that the fragmentation that's going on in the media, it is a good thing. When we think retail media is a huge opportunity and so is connected TV and all the other changes that are happening, like we mentioned, privacy. And so for us, who's a trusted, agnostic adviser to our clients, we think that there's a bigger opportunity than ever before to help our clients navigate that space."

OptionsHawk Executive Summary & Focus Stocks

The three large cap agency companies trade 6-8X EBITDA but weak topline growth seen ahead and limited EBITDA growth, so not really an area with any favorites. **Outfront (OUT)** screens well as a small cap but would caution the 5X Debt/EBITDA. Overall this is a group that lacks any real compelling investment opportunities at this time as the advertising backdrop weakens.

Business Services – IT/BPM Services

Components: ACN, INFY, CTSH, WIT, CDW, EPAM, GIB, G, GLOB, DXC, EXLS, WNS, DAVA, NSIT, TWKS, PRFT, KD, TASK, TTGT, PLUS, CNXN, GDYN, CNDT, UIS

International & Private Peers: Tata Consultancy, Capgemini, HCL Tech, NTT DATA, Fujitsu, NEC Corp, Deloitte

Intro

CIO surveys are showing a downtick in IT Services growth expectations, but resiliency is seen driven by growth and cost optimization initiatives consistent with digital transformation and outsourcing capabilities. First looks at '23 Budgets suggests relatively stable growth at 2.8%. Outsourcing in a downturn holds up far better than Consulting. IT Services companies are serving as enablers of digital transformation as they help plan, implement, and manage digital transformation projects and cloud adoptions. IT Services companies are beneficiaries of top CIO priorities such as cloud computing, security software, analytics, and digital transformation. Those with a higher mix of revenue and capabilities geared toward supporting digital transformation initiatives and cloud environments will fare best. Talent shortages remains a key headwind for firms. Disciplined tuck-in acquisitions, particularly in areas of high demand, allow IT Services companies to find and develop the new skill needed to execute on digital transformation projects.

CDW's end market diversification, evolving product breadth, and scale continue to be the differentiating characteristics that are allowing the company to take share even in a tough environment.

Industry Backdrop & Investment Considerations

Historically, the IT Services industry tends to be a late cycle beneficiary of major technological changes globally. Large Tech companies like Cisco, IBM, SAP, Oracle, and Dell also compete in this space. By 2022, 60%+ of global GDP will be digitized, with growth in every industry and almost $7 trillion in IT-related spending in 2019–2022.

IT and Business Process Outsourcing is more than a $1 trillion industry and growth set to be driven by digital and next-generation services. The global business process service industry is estimated at $200B serving commercial industries, government services, transportation, and other industries. BPM service providers work with clients to transfer their key business processes to reduce costs, improve process quality, handle increased transaction volumes and reduce redundancy

The IT spending environment is a key driver of earnings/revenues across the group, and this has historically been correlated with GDP growth.

The adoption of cloud offerings is a net positive for the IT services sector, with the greatest opportunity for TAM expansion in the public cloud followed by hybrid cloud. As businesses migrate computing workloads to the cloud, IT services companies have pivoted to offer services which assist clients with the transition. As customization becomes less labor intensive, the number of professional services required should decrease. This could be furthered by plug and play modules offered by SaaS vendors which include customization, patching and upgrades performed via the cloud.

Enterprise 4.0 is seen as an additional long-term growth driver with the potential adoption of Robotic Process Automation (RPA), IoT (Internet of Things)/Analytics and Artificial Intelligence (AI) serving as major tailwinds. Artificial Intelligence Revenue is expected to grow at a 60% CAGR through 2025. Digi-Capital forecasts that AR/VR could reach $80 billion to $90 billion by 2023.

Indicators, Metrics & Stock Selection Framework

Organic Sales Growth, EBIT Margins, P/E, EV/Sales

Valuation & Comps

EV/EBITDA to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
IT/BPM Services					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
ACN	Accenture Plc	193.9B	15.54X	8.41%	8.31%	18.17%	4.39%	34.48%	5.37%	3.76%	-0.65X
INFY	Infosys Ltd ADR	80.3B	1482.73X	13.43%	10.74%	24.36%	0.04%	14.01%	8.25%	20.02%	-0.50X
CTSH	Cognizant Technology Solutions Corp	29.9B	7.80X	7.14%	4.11%	19.33%	7.97%	16.86%	-2.20%	-4.66%	-0.50X
WIT	Wipro Limited (ADR)	26.6B	12.16X	14.07%	9.24%	17.49%	2.60%	16.82%	-7.67%	14.74%	-0.83X
CDW	CDW Corp	26.0B	14.59X	9.05%	4.87%	10.77%	#VALUE!	15.87%	24.52%	1.07%	2.21X
EPAM	EPAM Systems Inc	20.4B	21.55X	24.61%	17.51%	20.72%	#VALUE!	60.83%	24.74%	1.99%	-1.39X
GIB	CGI Inc	20.8B	11.47X	4.51%	3.87%	19.61%	6.19%	15.07%	10.95%	7.73%	1.19X
G	Genpact Ltd	8.3B	12.23X	11.21%	7.40%	19.27%	4.78%	14.99%	3.48%	-0.76%	1.22X
GLOB	Globant SA	7.6B	21.25X	19.44%	22.32%	20.82%	#VALUE!		3.17%	0.76%	-0.58X
DXC	DXC Technology Co	6.3B	3.87X	5.99%	-0.61%	18.2%	10.88%	12.9%	-4.42%	-11.69%	0.93X
EXLS	Exlservice Holdings Inc	5.8B	19.62X	7.55%	12.82%	21.27%	2.11%	21.41%	8.21%	7.49%	0.05X
DAVA	Endava PLC - ADR	4.8B	17.37X	26.42%	26.72%		#VALUE!	36.37%	30.27%	33.04%	
WNS	WNS (Holdings) Limited (ADR)	3.9B	14.55X	11.03%	10.07%		3.65%	21.85%	12.33%	12.29%	
NSIT	Insight Enterprises, Inc.	3.5B	8.51X	11.16%	3.69%	4.44%	#VALUE!	14.71%	23.46%	13.01%	1.75X
TWKS	Thoughtworks Holding Inc	3.2B	13.63X	24.48%	13.29%	20.2%	2.57%	(8.788%)	-10.65%	20.69%	0.82X
PRFT	Perficient, Inc.	2.6B	14.35X	10.84%	10.04%	23.28%	5.28%	19.96%	0.23%	-2.24%	1.72X
KD	Kyndryl Holdings Inc	2.5B		3.35%	-0.55%	10.24%	#VALUE!	(42.204%)	#VALUE!	#VALUE!	0.77X
TASK	Taskus Inc	1.7B	8.39X	18.87%	5.94%	23.89%	5.75%	15.47%	12.55%	26.78%	0.69X
CNXN	PC Connection, Inc.	1.3B	8.84X		1.12%	4.52%	#VALUE!	7.84%	17.57%	2.64%	-0.75X
TTGT	TechTarget Inc	1.3B	11.22X	15.06%	3.48%	41.88%	#VALUE!	24.41%	9.46%	12.95%	0.51X
PLUS	ePlus inc	1.3B	7.65X	4.17%	5.40%	10.19%	#VALUE!	22.82%	7.01%	6.98%	0.03X
GDYN	Grid Dynamics Holdings Inc	0.9B	11.43X	30.63%	17.71%	21.05%	#VALUE!	39.72%	138.50%	25.01%	-2.96X
CNDT	Conduent Inc	0.9B	4.38X	4.2%	-0.63%	11.05%	#VALUE!	7.41%	-19.71%	-1.73%	1.75X
UIS	Unisys Corporation	0.3B	1.79X	3.9%	-2.20%	11.38%	#VALUE!	(30.028%)	-74.16%	-9.44%	0.72X

Management Commentary

Insight Enterprise (NSIT) Investor Day on fragmentation, client needs, financial outlook and growth…"Insight has been evolving into a brand new breed of technology partner, building very specific capabilities that set us up in a unique and advantageous way. And by the way, this is especially important because the $4 trillion market that we serve and that we are participating in is growing at 6%, and it is incredibly fragmented. They need a Solutions Integrator. Clients don't have the time, the money or the appetite to put together all the pieces of the technology puzzle. It's just too complicated. They need efficient access, a simplified experience, deep expertise they can trust, someone who can architect, build and manage a technology environment. Well, let's start with accelerated profitable growth over the next 5 years and beyond. We're talking about growing faster than the market, about 200 basis points and growing our gross profits even faster than that expanding our EBITDA margin to nearly 7%, all delivering earnings growth at 20% CAGR. When we think about that, our sweet spot is actually the corporate mid-market. So think about Fortune 300 and below. We understand these clients incredibly well. We're actually one of them. We bring enormous value to them. They have very large IT budgets and very significant IT agendas. We have the product element, we have the supply chain element and we also have the technical capability in all the areas of IT today that are the fastest growing. The elements of IT that are growing in the double digits. The overall market is growing at 6, but data, cloud, AI, machine learning, all the digital aspects are growing at an even faster pace. Key drivers of growth as we move forward, core insight core services growth is going to be in the high teens, cloud services, cloud growth, also in the high teens EPS CAGR approaching 20%. And as we think about free cash flow, which we're defining as net cash flow from operations, minus capital expenditures required to support the business growth. That's going to be a conversion greater than 90% as we move forward."

PC Connection (CNXN) on its markets…. “We saw an increase in demand for software, networking and data center products. The increase in software and services demand is a result of more customers shifting their business to subscription services, cybersecurity and off-premise cloud solutions, along with other cost-saving technologies. Our growth in Q3 is largely attributable to the customized IT solutions that we integrate and deliver on behalf of our customers as they continue to work through their digital transformation and efforts to gain competitive advantage with technology. Our customers look to Connection to integrate and deliver these innovative solutions. Toward that end, we continue to leverage our managed services capability as customers turn their attention toward data centers, infrastructure and digital transformation initiatives. Our years of experience with supply chain optimization and our ability to deliver custom integrated solutions continue to be an important component of our growth and a competitive differentiator for us. Our growth was also attributed to our expertise in delivering customized solutions to our vertical markets. For example, in the finance vertical, we grew revenue 40% year-over-year and 12% sequentially as our customers were upgrading legacy hardware and focusing on securing their environment. Manufacturing revenue grew 3% year-over-year as clients focus on increasing automation and process integration as well as long-term investment in new technologies to support cybersecurity, risk reduction and growth opportunities. We expect our customers will continue to focus on data center, security and cloud transformation. We anticipate this trend will continue in the near term and will put pressure on top line revenue growth as it did this quarter. Last quarter, we indicated that year-over-year growth rates would be moderating, which they did. We expect that trend to continue for the near term. These expectations are in part due to record results recorded in the prior year period. Additionally, our customers are telling us that they're being more deliberate in sending and are being more restrictive on budget in the face of increasing economic uncertainty.”

ExlService (EXLS) on a softer outlook…. “Now when we go into the next two years, we still see a lot of uncertainty in the marketplace. The environment has significantly changed over the last 12 months. We also -- there's also the risk of potentially a recession in the next 2 years. And so that tempers our medium-term outlook. So we have been talking about a potential slowdown with investors over the last couple of conference calls. We have not really seen much of a change in our macro -- in our selling environment with our clients. We see the macro environment being uncertain. We get confidence from that by looking at our pipeline. Our pipeline has grown significantly over the last 18 months and it's still very robust. So when we look at our pipeline, we look at the success we're having in our wins, that tells us that not much has really changed going into December and the beginning of 2023. But what gives us the ability to continue to grow through an uncertain environment? In digital operations, we lead with data and using that data we digitize our clients' operations. So we'll take -- we'll win a deal to take over an operation for, say, an insurance company. And it's about -- say it's 200 people in that operation. We will embed digital to make it more efficient. Cost is going to be a big factor in an uncertain environment where they have cost pressures. And so we can help them manage through that environment going forward. And so as much as an uncertain environment could be a headwind to us, it could also provide a little bit of a tailwind to us in digital operations.”

OptionsHawk Executive Summary & Focus Stocks

Accenture (ACN) is a high-quality name but also starting to see some slowdown and trades a bit rich so not on the top list this year. **Cognizant (CTSH)** is struggling but also now trades less than 8X EBITDA so falls into a deep value buy category. **Infosys (INFY)** actually screens as the most attractive long with leading margins, rising estimates and double-digit growth ahead. **EPAM (EPAM)** is the strongest growth name and trades at a deserved premium multiple, it could once again become a major winner as it works through the issues from Ukraine/Russia. **Globant (GLOB)** consistently screens as a favorite small cap delivering the best growth in the group at a similar multiple to EPAM. **Insight (NSIT)** is steeply undervalued as a multi-year own and the recent investor day with enlightening. **Endava (DAVA)** is another excellent growth name along with **Exlservice (EXLS)** which always seems to be making new highs. Lastly, **Perficient (PRFT)** trading down to 14X offering double-digit growth and 23% operating margins looks attractive. Overall, despite some spending slowdown concerns, there are a lot of quality companies with long runways for growth in this group.

Business Services – Consulting

Components: FCN, EXPO, ICFI, HURN, CRAI, HCKT, VVI, RGP

International & Private Peers

Intro

The consulting stocks are all small caps and saw some wildly strong performances in 2022 but as indicated in the previous section, Consulting tends to be more at risk in economic downturns.

Industry Backdrop & Investment Considerations

The professional services industry is extremely competitive, highly fragmented, and constantly evolving. The industry includes a large number of participants with a variety of skills and industry expertise, including other strategy, business operations, technology, and financial advisory consulting firms; general management consulting firms; the consulting practices of major accounting firms; technical and economic advisory firms; regional and specialty consulting firms; consulting divisions of our technology partners; and the internal professional resources of organizations.

VVI operates in the Exhibition and Conference market which over $34B in 2019 with low-single digit growth from 2016. Experiential Marketing is a large, fast-growing segment of the corporate marketer's budget inside of the digital & alternative marketing segment and expected to grow at a 7% CAGR through 2024. Venus Services is a $10B market opportunity.

Catalysts for future growth across multiple industries include IT modernization, infrastructure spending, energy efficiency, data analytics, resilience planning, public health, litigation, restructuring, biomechanics and data analytics. Businesses are operating in an increasingly complex economic, legal, and regulatory environment that create both challenges and opportunities. Companies across industry sectors are seeking new strategies appropriate for the current economic environment, as well as greater operational efficiencies.

Key trends include increased government focus on environmental initiatives; efficiency and mission performance management; generational changes; the emphasis on transparency and accountability; and an increased demand for combining domain knowledge of client mission and programs with innovative technology-enabled solutions.

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Indicators, Metrics & Stock Selection Framework

Organic Sales Growth, EBIT Margins, P/E, EV/Sales

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Consulting					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
FCN	FTI Consulting, Inc.	5.5B	16.34X		7.24%	12.76%	#VALUE!	17.21%	-3.45%	0.99%	0.06X
EXPO	Exponent Inc	5.3B	32.96X	(3.989%)	7.42%	27.18%	#VALUE!	41.07%	2.40%	0.01%	-1.14X
ICFI	ICF International Inc	2.0B	14.20X	10.51%	11.26%	10.64%	#VALUE!	7.21%	10.92%	4.28%	2.89X
HURN	Huron Consulting Group Inc	1.5B	14.10X		9.73%	12.78%	#VALUE!	7.72%	6.45%	9.96%	2.27X
RAI					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
HCKT	The Hackett Group, Inc.	0.6B	8.61X		1.89%	24.85%	6.25%	31.95%	14.17%	6.19%	-0.90X
RGP	Resources Connection, Inc.	0.6B	6.02X	2.33%	4.48%	15.05%	#VALUE!	18.58%	6.87%	5.31%	-0.42X
VVI	Viad Corp	0.6B	10.50X	19.88%	9.48%	21.41%	#VALUE!	(16.795%)	-135.38%	21.54%	1.24X

Management Commentary

Exponent (EXPO) on demand trends…. "As companies push forward innovations with increasing attention to safety, health and the environment, exponent remains a necessary and critical adviser as they leverage our differentiated data analytics and unrivaled subject matter expertise to help solve their most profound challenges. Demand for our scientific and engineering expertise remains strong, with broad-based growth driven by work related to the consumer products, utilities, automotive and life sciences sectors. Within our proactive services, we saw strong demand for our work related to virtual reality, wearable technologies and energy storage. On the reactive side, we benefited from a robust litigation activity and also a diversified portfolio of product safety and recall-related work, particularly in the life sciences space. Overall, traction across our multidisciplinary offering showcases the strength of our long-term strategy. Within the automotive space, we are supporting clients through our work in batteries and energy storage, advising them on safety frameworks to mitigate risk. While still in the early stages, we see long-term growth opportunities related to electric vehicles, driven by society's ongoing focus on sustainability."

ICF International (ICFI) on Government strength…. "The fastest-growing client category by far was the federal government, where revenues increased 39% in the third quarter and are up over 29% year-to-date. Civilian agency contract spending continues to grow in line with an 8.9% increase in federal surveillance agency appropriations for fiscal year 2022. And according to Bloomberg data, IT modernization and cloud migration initiatives have been among the fastest-growing spending areas. Our recent organic investments and acquisitions have positioned us well to capitalize on these trends. Federal government agencies are also currently very active in developing the detailed formulas and procedures for implementing the infrastructure and jobs act or IIJA. ICF has already been tasked under existing federal agency contracts to support these IIJA activities, and this task been to date is valued at approximately $40 million. We continue to also see government at all levels increase spending on mitigation."

OptionsHawk Executive Summary & Focus Stocks

This is a group of small names and **ICF International (ICFI)** remains a favorite with strong growth and winning a lot of new contracts. **Viad (VVI)** should continue to recovery from the pandemic woes and trades cheap at 10.5X.

Business Services – Payroll & Staffing

Resources: SIA

Components: ADP, PAYX, RHI, BZ, AMN, NSP, ASGN, MAN, TNET, KFY, CBZ, ZIP, KFRC, CCRN, TBI, KELYA, HSII

International & Private Peers: Adecco, Randstad, TeamLease, Quess

Intro

The payroll firms face macro uncertainty and the likelihood of a slowing jobs market but to this point trends have remained strong outside of some impact of SMB closures. Strong hiring, pricing and yield-driven float-related upside have more than offset that impact. ADP suggested that based on the current trajectory of interest rates and float balance, annualized float income could reach roughly $1B over the next couple of years. ADP has seen labor markets remain largely resilient and client bankruptcies low. In a broader economic downturn, ADP believes retention rates will be under some pressure (especially at the small end of the market), but expects the more economically sensitive metric to be bookings. bookings. Ultimately, management anticipates pays per control will return to their pre-pandemic average level of 2%-3%, vs recent elevated levels (7% in F4Q), as pandemic-related tailwinds/pent-up demand wanes.

The staffing market is seeing a softening macro but still healthy labor market with tightness and strong wages. The Business Roundtable's 3Q22 overall CEO outlook index dropped to 84.2 from 95.6 2Q and 114.0 a year ago. The 3Q22 CEO employment outlook index declined to 78.4 from 89.4 in 2Q and 108.1 last year. The National Federation of Independent Business' small business outlook for general business conditions fell to a net-negative 46%, down from (44)% in September, still at historically low levels.

Industry Backdrop & Investment Considerations

Annual global staffing industry revenues are near $500B with small businesses representing a large and underserved market. Tech staffing (KFRC, ASGN) is expected to be a $32B market in 2021 and has doubled in ten years and IT staffing is seeing strong demand after the pandemic accelerated the need for digital transformations. Over the next decade, demand for skilled workers will outstrip supply, resulting in a global talent shortage. Organizations must make talent strategy a key priority and take steps now to educate, train and upskill their existing workforces.

US staffing revenue will grow by 16% this year to a record total of $157.4B according to the Staffing Industry Report (SIA). The new forecast also projects staffing industry revenue growth for 2022 at 4%. The largest industry segment, temporary staffing, is forecast to grow its revenues at an annual rate of three percent in 2020 to $134.5B, up from $130.9B in 2019. Within the temporary staffing segment, professional staffing is expected to grow its revenues three percent in 2020 to $81.6B, up from $78.8B in 2019. The temporary staffing industry is historically cyclical and typically has a strong correlation to employment and GDP growth. Permanent placement services revenues are forecast to grow two percent in 2020 to $21.7B, up from $21.2B in 2019. On a more niche level the Executive Search market (HSII, KFY) is a $14B market and also private players Spencer Stuart and Russell Reynolds as leaders as well as International players Egon Zehnder and Caldwell Partners.

The global HCM market is large, growing and evolving as shown below at a $150B opportunity growing 5-6% annually. Many organizations have faced declining payrolls and headcounts, while others have experienced almost unprecedented levels of demand. Leading HCM vendors have focused substantial time and capital to meet ever-changing reporting and compliance demands and have made major investments in new employee support features and tools.

Technology is influencing this industry via data analytics, customer engagement, personalization, and performance measurement. The dynamics of the workforce have changed sharply since the pandemic with remote work a major theme. Organizations are increasingly choosing to address their workforce needs in more flexible ways with a growing shift in workforce strategy towards a project-based orientation with an enhanced emphasis on business agility. Permanent professional personnel positions are being reduced as organizations engage agile talent for project initiatives and transformation work.

Indicators, Metrics & Stock Selection Framework

Organic Sales Growth, EBIT Margins, P/E, EV/Sales, EV/EBITDA

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Payroll & Staffing					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
ADP	Automatic Data Processing Inc	107.9B	22.19X	8.24%	7.08%	27.34%	#VALUE!	22.98%	19.18%	10.13%	0.34X
PAYX	Paychex, Inc.	44.2B	19.86X	6.94%	6.29%	44.74%	#VALUE!	11.76%	12.30%	8.89%	-0.19X
BZ	Kanzhun Ltd	8.6B	59.13X	66.98%	36.05%	25.87%	#VALUE!	########	2.14%	7.21%	-11.03X
RHI	Robert Half International Inc	8.2B	8.00X	14.93%	-5.05%	12.95%	8.64%	61.44%	-1.40%	-2.13%	-0.62X
AMN	AMN Healthcare Services, Inc.	4.8B	6.57X	5.24%	-17.89%	15.97%	11.31%	22.19%	27.09%	9.54%	1.00X
NSP	Insperity Inc	4.5B	12.57X		8.44%	5.55%	#VALUE!	(5.635%)	21.81%	2.34%	-0.63X
MAN	ManpowerGroup Inc	4.4B	6.32X	18.24%	-5.98%	3.93%	10.12%	11.13%	-1.39%	-8.45%	0.60X
ASGN	ASGN Inc	4.3B	9.33X	10.84%	4.29%	12.41%	7.11%	5.32%	5.31%	4.00%	1.19X
TNET	TriNet Group Inc	4.2B	6.74X	6.16%	7.50%	46.88%	#VALUE!	52.22%	25.51%	318.41%	-0.01X
KFY	Korn Ferry	2.7B	5.97X	(6.63%)	-2.23%	18.01%	#VALUE!	33.39%	-20.54%	7.49%	-0.88X
CBZ	CBIZ, Inc.	2.5B	14.74X	4.57%	5.08%	12.63%	#VALUE!	8.52%	5.24%	27.80%	1.45X
ZIP	Ziprecruiter Inc	1.9B	9.91X	25.0%	3.89%	22.76%	#VALUE!	(30.834%)	-481.82%	23.71%	-0.70X
CCRN	Cross Country Healthcare, Inc.	1.1B	3.85X	5.67%	-20.06%	10.03%	#VALUE!	33.54%	32.03%	16.33%	0.60X
KFRC	Kforce Inc.	1.1B	8.22X	8.27%	-2.74%	8.41%	#VALUE!	29.93%	0.24%	0.28%	-0.12X
TBI	Trueblue Inc	0.6B	5.65X	27.36%	-4.84%	6.33%	10.55%	14.14%	2.28%	-5.53%	0.29X
KELYA	Kelly Services, Inc.	0.6B	4.50X		4.20%	1.64%	#VALUE!	5.1%	-13.47%	-3.26%	-1.68X
HSII	Heidrick & Struggles International, In	0.6B	1.03X	34.32%	-8.75%	12.81%	#VALUE!	(53.586%)	-0.80%	0.95%	-3.26X

Management Commentary

Automatic Data (ADP) on the state of the economy…. "So I guess just to start, since we serve companies across the spectrum, clearly, we do care about all major economic indicators, we track, whether it's PMI, consumer spend. We're in some ways exposed to all of it given our client base, but clearly, the elements that matter most to us are things that affect employment, either directly or indirectly. Data there suggests clearly, we're still adding heads to the overall labor force, which is good in many ways, and it's challenging, I think, in many ways as well. Good, of course, in the sense that for us, we derive some of our revenues from that. So we're happy to see that our clients continue to add that they're optimistic about their ability to grow and therefore, they're investing in their own labor forces. The other things that we track, just given our exposure to companies of all sizes, small businesses demonstrate a lot of cyclicality, as we all know. And so formations and bankruptcies matter a lot to us. And we track public data formations and that has an impact on our ability to drive new business bookings growth among our small business target market. That's pulled back since the early days of the pandemic, but that's still at healthy levels. Our mix from a vertical standpoint, probably mirrors the overall market for our Employer Services business, which is our major segment. The PEO business, which is faster growing and now constitutes over 35% of our revenue, that business does have clear selection bias. So again, from a vertical standpoint, the PEO is probably positively mix compared to the typical U.S. company in our ES segment. So those 2 things matter. And generally, what you see then is the average PEO client tends to fare pretty well in a downturn. Now that it's such a big part of our business, it does matter. So we're happy about that, and we would expect the PEO to continue to do well."

Robert Half (RHI) on staffing markets… "lobal labor markets remain tight, and clients continue to hire, albeit at a more conservative pace. Demand for talent remains high, notwithstanding the increasingly uncertain economic outlook, although the sales cycle has lengthened. Many clients are becoming more selective and requesting to see more candidates for their open positions. They're adding more steps to their hiring processes and prioritizing on-site or local hybrid candidates who take longer to hire. At the same time, talent shortages persist. In the United States, job openings and quit rates remain at elevated levels, although modestly off their highs. The unemployment rate stands at 3.5%, a 50-year low, while the rate for those with a college degree, more representative of our candidate base, is half that at 1.8%. Many candidates continue to prefer remote and hybrid working models, a structural shift that's expected to remain. Sourcing from this talent pool plays to our numerous strengths, including our global brand, office network, candidate database and advanced AI-driven technologies. Many times, clients' very specialized needs are only available on a remote basis. Protiviti's pipeline remains robust and is a little impacted by current economic conditions. While short-term talent solutions results may be impacted by a more uncertain macroeconomic environment, we remain optimistic about our overall outlook."

CBIZ (CBZ) on client conversations…. "Before we move to Q&A, I want to touch on what we're hearing from our clients, the fundamental attributes of our business that we believe will allow us to continue our strong performance even if the business climate becomes more challenging and provide a brief update on our M&A activity. The fundamental attributes of our business model include that approximately 75% of our revenue trumps from essential and recurring services. That's work that our clients need us to perform regardless of the business climate. And of the remaining 25% of the more project-oriented work, we often see continued demand for a good portion of that work even in slower economic periods, although the service is provided and the scope of engagements may be different. Other positive attributes of our business are that we enjoy very high rates of client retention at approximately 90%. Finally, as I previously mentioned, we continue to make significant progress in driving improved pricing for the core services provided by our financial services group. We are confident in our ability to maintain the rates that we have in place and feel that there is still more room to continue to secure pricing increases in the future. Moreover, our continued investments to expand our service offerings and add people with specialized depth of expertise also position us to support our clients in new ways and to help them navigate and find opportunities in more challenging business climate. As we demonstrated throughout the pandemic, revenue generated from these types of services helped to mitigate the impact of other areas of our business that may be that may experience slower demand in this kind of a landscape."

OptionsHawk Executive Summary & Focus Stocks

The two large caps, ADP and PAYX continue to offer solid top and bottom-line growth, the latter at higher margins and cheaper valuation, so **Paychex (PAYX)** makes the cut as a preferred name while ADP in the quality, but not currently bucket. The smaller cap names offer modest growth but valuations are cheap while estimates are likely to come in further. **TriNet (TNET)** a quality name that is looking cheap at 6.75X despite offering solid growth and margins while **CBIZ (CBZ)** a strong idiosyncratic story. I still like the long-term opportunity for **Zip Recruiter (ZIP)** which is now undervalued and may be an attractive M&A target.

Business Services – Facility & Uniform

Components: CTAS, MSA, UNF, ABM, BRC, CDRE, HCSG, SP, CVEO

International & Private Peers

Intro

This is a small niche group of facility and uniform service names with Cintas (CTAS) the main leader. This group also includes SP which is in the parking management, ground transportation services and baggage service industries that are large and fragmented. Brady (BRC) another niche name here is involved with identification products and workplace safety and also included MSA Safety (MSA). A commonality in the group is ties to the healthy of the labor market which translate into demand for these products.

CTAS is seeing strong momentum with new business trends, pricing power, retention rates, and cross-sell/upsell activity. However, CTAS is not immune to labor market pressure and customers/potential customers pulling back on spending. CDRE provides safety and survivability equipment for first responders which includes body armor, explosive ordnance disposal, duty gear, and other protective and law enforcement equipment.

Industry Backdrop & Investment Considerations

The Janitorial Industry comprises establishments primarily engaged in cleaning building interiors, interiors of transportation equipment, and/or windows. Industry activities include contract cleaning services for factories, retail outlets, shopping centers and malls, business and government offices, trains and airlines and housecleaning services. It is a highly fragmented industry. The two largest players in the industry are ABM Industries and ServiceMaster. Estimates for the total market for janitorial services range from $35 billion to $49 billion. The industry is not substantially capital intensive, but it is highly labor intensive. Industry growth is related to growth in the general real estate market.

The safety products market is highly competitive, with participants ranging in size from small companies focusing on a single type of PPE to several large multinational corporations that manufacture and supply many types of sophisticated safety products. Firefighter Safety, Gas Detection, and PPE markets are estimated near $9B in size. Nuclear and Cleanroom garments and services a $1B market, first aid service, training and products a $1.5B market while industrial uniforms, protective wear and work clothing a $39B market.

Uniforms are very fragmented markets with CTAS/UNF dominating market share are Aramark (ARMK) also a player. Textile rental services is a $39B market with the top three providers (CTAS, ARKMK, UNF) having a 26% market share. Uniform and Dust Control market is a $10.3B annual market with the same top three players having a 65% market share.

The market shift towards more service-oriented economy will increase overall demand for uniform rentals. Regulatory pressures increase demand for safety workwear and managed outsourced programs for hygienically clean garments and facility service products.

Indicators, Metrics & Stock Selection Framework

A combination of high asset turnover and strong FCF conversion translates into robust CROCI ratios within Business Services. Margin expansion is valued, though to a lesser extent than organic revenue growth, with investors tolerant of reinvestments by strong capital allocators to fund growth. Margin expansion through cost cutting without the presence of attractive organic revenue growth is generally not rewarded in valuation multiples. The factors that drive healthy organic revenue growth, specifically, favorable exposure to thematic trends, an ability to gain market share and presence of a transformative catalyst, will yield outsized earnings and stock price performance.

Organic Sales Growth, EBIT Margins, P/E, EV/Sales, EV/EBITDA

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Facility & Uniform					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
CTAS	Cintas Corporation	46.6B	23.01X	10.36%	6.49%	23.23%	2.87%	14.34%	9.76%	11.00%	1.40X
MSA	MSA Safety Inc	5.3B	17.13X		6.56%	22.7%	#VALUE!	10.21%	6.99%	0.82%	1.26X
UNF	UniFirst Corp	3.5B	10.63X	9.23%	4.92%	18.86%	2.00%	7.4%	-2.46%	1.17%	-1.01X
ABM	ABM Industries Inc	2.9B	8.01X	7.92%	4.07%	6.5%	8.01%		1.67%	1.44%	2.22X
BRC	Brady Corp	2.3B	9.90X	0.03%	2.67%	18.62%	#VALUE!	13.47%	14.47%	-0.34%	-0.07X
HCSG	Healthcare Services Group, Inc.	1.0B	16.14X	29.59%	1.47%	1.68%	-18.15%	(4.685%)	-26.60%	-2.26%	-3.72X
CDRE	Cadre Holdings Inc	0.8B	12.38X	9.92%	8.94%	14.82%	4.22%	4.68%	-77.51%	2.99%	1.82X
SP	SP Plus Corp	0.7B	8.33X	8.72%	3.68%	15.21%	#VALUE!		10.96%	19.69%	2.31X
CVEO	Civeo Corp	0.4B	5.19X	14.52%	-2.67%	19.01%	#VALUE!	0.24%	-34.38%	11.75%	0.94X

Management Commentary

SP Plus (SP) on the Aviation business…. "This has been a strong year for new contract wins in our Aviation segment. And in addition to new locations, we've been able to sell-in additional products and services at existing locations. Our Aviation business is still in recovery mode, and we still see significant additional upside as travel trends continue to improve and demand increases for our services that reduce friction and ease congestion. Historically, our business model has been recession-resistant through past downcycles. And now that management contracts represent 85% of our Commercial segment, we believe that resilience is further enhanced. Additionally, our technology offerings, which we've expanded with the recent acquisition is not just a differentiator but a profit driver for our clients, which is increasingly important in more challenging economic environments. And we're continuing to make investments in business development and other resources to better position us to take advantage of our expanded addressable market."

Cadre (CDRE) on Police budgets…. "With the focus on crime during this midterm election cycle, we continue to see a push to refund police budgets rather than defund. Additional long-term tailwinds include the American Rescue plan funding more police as well as anticipated long-term demand resulting from the Ukraine conflict. These represent long-term opportunities supporting demand for Cadre's mission-critical products, and we continue to anticipate our total addressable market to grow, particularly internationally. North American police budgets remain healthy as we are seeing signs of increasing spend per officer. Hiring, however, remains an issue and departments are still struggling to fill open positions. We expect it to take some time for officer headcount to return to historical levels. Further improving gross and adjusted EBITDA margins over the long term remains a priority, and we will continue to seek to achieve cost structure optimization to drive operating leverage and expect margin expansion over time. Finally, we will continue to see compelling M&A opportunities that expand our product and technology offerings, enter new markets and grow our geographic footprint. We remain extremely optimistic about our long-term prospects underpinned by this robust pipeline and the strong long-term macro tailwinds driving demand and visibility for Cadre's mission-critical products, both domestically and internationally."

MSA Safety (MSA) on its business segments…. "When you look at our product portfolio, I like to break the portfolio into 3 key areas. Number 1 is firefighter safety. Firefighter safety represents about 40% of our business. We're #1 in the world when it comes to protecting the firefighter from head to toe. We're #1 in helmets, #1 in breathing apparatus, #1 in turnout gear and their clothing. There are moats around that business. There's high barriers to entry and standards and regulations. Just in the North American market, we had 6 competitors in the fire service market. We have very strong market share, which provides us with good pricing power in the space. And we continue to gain market share, 1 out of every 2 breathing apparatus deals we sell are competitive conversions. So we continue to eat in the market share. We've expanded that into the international market, where we're doing quite well internationally. And if there's an economic downturn, this business doesn't get impacted. Gas Detection business break -- that's about 1/3 of our business, break that into 2 categories. There's fixed gas and flame detection, fixed gas and flame detection. Those are products that you install to protect assets, infrastructure and the environment. And fall protection is our smallest category. That's where we're distant #3 on a global basis. Falls are the #1 killer of construction workers here in the U.S. We think that there's some opportunity to invest in R&D and come up with better solutions for customers and users to better protect their lives on the job site."

OptionsHawk Executive Summary & Focus Stocks

Cintas (CTAS) continues to execute well and is a best-in-class name, though now a bit rich at 23X EBITDA. **UniFirst (UNF)** feels like an eventual M&A target trading cheap at 10.5X. **ABM (ABM)** is a favored small cap cheap at 8X with steady growth and strong FCF, albeit at lower margins and facing plenty of headwinds. **Cadre (CDRE)** is the most intriguing name in this group with an $800M market cap trading 12X with near double-digit growth.

Business Services – Education

Components: EDU, LOPE, GHC, TAL, LAUR, ATGE, STRA, AFYA, LRN, PRDO, FC, VSTA, APEI, UTI

International & Private Peers

Intro

The Education group sharply outperformed markets in 2022 and while headwinds such as rising inflation and a tight labor market persist, they also appear to have peaked. Education stocks are a group that tends to outperform in a recession as people look to position themselves favorably in a tougher job market and enrollments are seen inflecting positively in 2023.

Industry Backdrop & Investment Considerations

Developing nations such as China and India often rely on education and training services to help support economic growth. The US education and training services industry includes about 67,000 establishments (single-location companies and units of multi-location companies) with combined annual revenue of about $43B. The global online education market is expected to reach approximately USD $133B by 2023, growing at a CAGR of 28.55% from 2017 to 2023.

According to the *Training* magazine 2020 Training Industry Survey, the total size of the U.S. training industry is estimated to be $82.5 billion. The training industry is highly fragmented and includes a wide variety of training and service providers of varying sizes.

Educational Services is widely considered a counter-cyclical industry. That is to say, typically, when the economy is doing poorly and unemployment is rising, more working adults, as their career prospects start to dim, decide to upgrade their education. This, in turn, leads to higher enrollment and increased profit at the schools.

A few on the stronger trends in education include high demand for online education, cloud-based solutions offering lower costs, improved accessibility and faster deployment, increased adoption of video content, virtual instructors, and higher enrollments with an increased focus on quality learning. Education technology (EdTech) is a term used to describe the industry that combines education and technological advances, revolutionizing the conventional landscape of education. According to Holon IQ, the global education market has reached a value of over $6 trillion with only $150B of market capitalization. Even though digitization only occupies 2.6% of the total educational expenditures as of 2018, indicating $152B of EdTech expenditures, digital spend is expected to increase to a $342B scale, taking 4.4% of total educational expenditures by 2025. Here are a few major segments within the EdTech realm, including early childhood, K-12, higher education and lifelong learning. The K-12 software platform and tools market is the dominant segment within the EdTech industry. This portion of the K-12 market had a market value of $1.71B in 2018 in the U.S. and is expected to be worth more than $1.83B by 2020. Compared to other segments within the U.S., K-12 has occupied 46% of the EdTech market while higher education and lifelong learning together occupy the other 54%.

Indicators, Metrics & Stock Selection Framework

Enrollments, Revenue Growth, Operating Margins, FCF Growth

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Education					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
EDU	New Oriental Education & Tech Grp (AD	5.5B	4.12X	45.21%	14.09%	2.26%	#VALUE!		-123.43%	-6.88%	
TAL	TAL Education Group (ADR)	4.2B	23.72X	150.87%	20.33%		#VALUE!	(27.779%)	-109.44%	-75.88%	
LOPE	Grand Canyon Education Inc	3.2B	11.38X	2.11%	4.76%	25.44%	6.12%	28.06%	-0.60%	-1.23%	-0.73X
GHC	Graham Holdings Co	2.9B	8.29X	47.94%	1.91%	7.82%	12.08%	3.0%	31.62%	7.95%	-0.25X
STRA	Strategic Education Inc	2.0B	10.79X	7.71%	4.39%	12.01%	4.51%	3.48%	-24.71%	-1.08%	-1.17X
ATGE	Adtalem Global Education Inc	1.7B	5.91X	4.97%	3.35%	23.14%	9.83%		37.46%	3.24%	1.38X
LAUR	Laureate Education Inc	2.3B	6.29X	7.83%	9.31%	24.19%	7.41%	(167.521%)	-39.86%	4.17%	-0.37X
AFYA	Afya Ltd	1.4B	9.68X	17.3%	13.32%	39.4%	#VALUE!		37.67%	35.94%	1.70X
LRN	Stride Inc	1.4B	6.52X	15.87%	7.92%	0.72%	12.65%	12.7%	-13.71%	6.16%	15.77X
PRDO	Perdoceo Education Corp	0.9B	2.54X		-3.45%	22.97%	#VALUE!	(0.001%)	20.45%	4.02%	-3.36X
FC	Franklin Covey Co.	0.7B	12.60X	16.55%	12.20%	16.94%	#VALUE!		59.51%	15.87%	-0.58X
VSTA	Vasta Platform Ltd	0.3B	6.42X	18.01%	19.54%	12.13%	#VALUE!	(1.811%)	-191.67%	30.43%	5.05X
APEI	American Public Education, Inc.	0.3B	4.12X	6.33%	2.74%	6.33%	#VALUE!	7.02%	-568.25%	-3.05%	-0.74X
UTI	Universal Technical Institute, Inc.	0.2B	3.07X	45.22%	18.22%	12.68%	#VALUE!	26.93%	38.57%	27.85%	-0.27X

Management Commentary

Grand Canyon (LOPE) on new enrollments and programs…. "GCE continues to work with GCU to roll out new and relevant programs. Since the transition 4 years ago, GCU has rolled out 135 new programs, emphasis and certificates, 13.7% of new students enrolled in these programs in the latest quarter. This has resulted in the third quarter new online enrollments growing in the mid-teens over the prior year, and we are currently projecting new enrollment growth in the fourth quarter to be similar. Based on these trends, we should return to total online growth in the first half of 2023. It is important to note that this return to positive growth has been accomplished with no loss of strength in the quality of GCU's online student body. And as a result, no degradation of the quality metrics, including good graduation rates, low cohort default rates and continued low student debt levels. Revenue per student continues to grow on a year-over-year basis primarily due to increased room, board and other ancillary revenues from GCU's traditional ground students as compared to the prior year period and the growth in the enrollment for ABSN hybrid students. Service revenue per student for hybrid ABSN students generates a significantly higher revenue per student than we earn on the other students, as these agreements generally provide us with a higher revenue share percentage."

Franklin Covey (FC) on its attractive markets…. "As you can see in Slide 13, our focus is on 3 large and growing markets, the Enterprise learning market where our total addressable market is $99 billion and growing by approximately $3 billion a year, the Education market where our total addressable market is $59 billion and growing approximately $1 billion a year, and the market where business leaders invest dollars directly from their operating budgets in order to improve their organization's performance. Here the total addressable market is not defined but organizations, operating budgets are in the trillions of dollars and growing. Each of these markets is highly fragmented with the largest players accounting for only approximately 1% to 2% of sales. It's the size of these markets and their fragmentation that provides us with tremendous headroom for growth and our strength puts us in a position to increase our share of these markets, we think, particularly in difficult times. As substantially all of our business become subscription and subscription services over the next few years, we expect our overall growth in revenue and profitability to accelerate."

OptionsHawk Executive Summary & Focus Stocks

It is too hard to predict China, so I am not comfortable owning any of those plays, a big part of this group. In the US group valuations are cheap and **Adtalem (ATGE)** a name I profiled early in 2022 remains my favorite of the group. **Franklin Covey (FC)** was highlighted earlier in this report and is a quality small cap. **Afya (AFYA)** screens as the best growth name with high margins but carries the risk of being a Brazilian company.

Business Services – Healthcare & Childcare

Components: SCI, PLNT, BFAM, MMS, HI, LTH, XPOF, MATW, CSV, WW, FXLV

International & Private Peers

Intro

This is another hodgepodge group that lacks a lot of close comparable companies and includes the death care services, daycare provider, fitness centers, and healthcare services.

PLNT recently hosted its first investor day expecting to double membership and exceed the 4,000 US unit potential while also looking to enter new international markets. PLNT is also seeing a lot of success with its digital efforts and new app. PLNT fortified its competitive position in recent years, and came through Covid with no closures, while +25% of industry capacity closed. BFAM continues to struggle with labor shortages, lower enrollments and higher wages pressuring margins. SCI and CSV will continue to face pressures from a more rapid normalization of death rates but continue to win market share in a fragmented industry.

Industry Backdrop & Investment Considerations

The funeral services industry is very fragmented with Service Corp. (SCI) the leader having around 15% market share and independents accounting for 80%. The global death care services market is massive, expected to hit $110B in 2022 with the US market seen reaching $68B in 2023 at a 4% CAGR. Funeral home and cemetery businesses provide products and services to families in three principal areas: (i) ceremony and tribute, generally in the form of a funeral or memorial service; (ii) disposition of remains, either through burial or cremation; and (iii) memorialization, generally through monuments, markers or inscriptions.

According to the International Health, Racquet & Sportsclub Association the U.S. health club industry generated approximately $33B in revenue in 2021. The industry is highly fragmented, with 39,570 clubs across the U.S. serving approximately 62.5 million members, according to IHRSA. The global home fitness equipment market saw a compound annual growth rate (CAGR) of 40.4% from $6.76 billion in 2019 to $9.49 billion in 2020 but is expected to decline 3.16% by 2023. The pandemic helped the global fitness app market reach a valuation of $4.4 billion in 2020 and is expected to a CAGR of 21.6% from 2021 to 2028. The fitness tracker market reached $36.34 billion in revenue in 2020 and is expected to experience a 15.4% CAGR from 2021 to 2028.

The global market for child care reached a value of nearly $339B in 2018, having grown at a CAGR of 8.3% since 2014, and is expected to grow at a CAGR of 11.3% to nearly $525B by 2022. BFAM is the leading provider of employer-sponsored center-based childcare, back-up care, and workforce education and estimates approximately six times more market share in the United States than its closest competitor. In child-care demographic tailwinds from changing work dynamics continue to support the industry as seen below while adjacent services like back-up care and educational advisory are providing higher growth and margin contributions.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, FCF Yield, Revenue Growth

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Healthcare & Childcare					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
SCI	Service Corporation International	10.7B	11.78X	5.34%	-1.42%	25.32%	4.58%	11.56%	23.33%	10.26%	3.96X
PLNT	Planet Fitness Inc	7.2B	24.10X	14.96%	15.34%	38.42%	2.57%	12.01%	4.95%	0.92%	4.29X
MMS	Maximus Inc	4.4B	12.73X		3.30%	12.7%	#VALUE!	4.72%	-7.27%	5.58%	2.26X
BFAM	Bright Horizons Family Solutions Inc	4.0B	15.84X	17.06%	10.48%	14.91%	4.36%	6.32%	-19.25%	-3.75%	2.76X
HI	Hillenbrand, Inc.	3.4B	7.41X	8.33%	2.93%	17.96%	7.88%	10.97%	10.00%	13.34%	1.78X
XPOF	Xponential Fitness Inc	1.1B	19.56X	30.2%	17.73%	31.37%	#VALUE!	13.5%	-93.24%	14.31%	1.31X
LTH	Life Time Group Holdings Inc	2.6B	16.32X	19.33%	22.33%	13.68%	1.22%	(6.285%)	-71.23%	-2.11%	7.05X
MATW	Matthews International Corp	0.9B	7.60X	7.94%	2.14%	12.22%	#VALUE!	3.99%	-2.54%	4.60%	3.27X
CSV	Carriage Services, Inc.	0.4B	9.10X	17.29%	2.13%	26.12%	#VALUE!	6.94%	-17.11%	-1.95%	6.30X
FXLV	F45 Training Holdings Inc	0.3B	15.63X	67.65%	-1.67%	20.94%	#VALUE!	(604.131%)	-226.50%	-50.71%	2.54X
WW	WW International Inc	0.3B	7.55X	13.29%	-9.42%	29.81%	11.66%	12.27%	-380.48%	-6.42%	4.21X

Management Commentary

Service Corp (SCI) on excess deaths…. "Now fast forward to the third quarter. I think we are finally seeing the expected decline in volumes as a result of COVID slowing down finally. But what I'll tell you is the funeral volumes that have come through over the past six months have continued to be very strong, even absent the COVID impact that we've seen on our business. And the CDC has mentioned these as excess deaths that we've been seeing coming through. It could be related to the deferred health care where stage one cancer could have been caught early had the screenings taking place. But unfortunately, now that's occurring and it's being found at stage three and four. So we're seeing the impacts of deferred health care during the COVID crisis. We're seeing the impacts of psychological impacts such as suicide, drug overdoses, alcoholism. So there are about 22,000 funeral homes in North America between the funeral -- between U.S. and Canada. And so it's definitely a very -- it's a nice tight out there."

Planet Fitness (PLNT) on gym closures…. "As I mentioned earlier, so 10,000 gyms in the country have closed, 25% of the industry is permanently shut down from COVID. And because of our unit economics, roughly 40% EBITDA margins in our stores pre-COVID and the strength of our franchise system and our team here at the office -- we didn't lose a single store because of COVID. And in fact, while the industry shrunk, we opened 260 stores in 2020 and 2021 combined. So again, this flywheel spinning, and we're getting back on track for growth and that marketing machine going in digital as well, pushing sales, pushing joins to get people off the couch again for the very first time. Gen Z has really taken off and we keep seeing a newer generation, their propensity to join gyms and work out is higher than the previous generation."

OptionsHawk Executive Summary & Focus Stocks

Planet Fitness (PLNT) is a solid business with a strong growth outlook as it recovers from the pandemic and emerges even stronger, a bit pricey but expect a positive revision cycle to support shares. **Bright Horizon (BFAM)** is a former compounder hit hard by the pandemic has a similar set-up for strong growth and think many of its headwinds are abating and can return to being a great investment. **XPO Fitness (XPOF)** is a top small cap I profiled a few months ago and really like its opportunity for growth long-term.

Travel & Leisure – Hotels & Resorts

Components: MAR, HLT, HTHT, H, IHG, CHH, WH, VAC, HGV, TNL, PK, PLYA, GHG

International & Private Peers

Intro

Q3 reports across the Lodging group show stable demand but the post-pandemic recovery is starting to flatten out while margin recovery remains a key theme. The average 4Q22 RevPAR outlook is +80bps ahead of Q3 relative to 2019. Companies pointed to sustained leisure demand, the return of group business and improvements in business transient activity driving the quarter. Bookings, leads, and meeting planner activity all remain healthy. China remains volatile but could be an opportunity in 2023. Amid rising construction costs, supply chain and China delays and a tightening financing environment, investors were expecting slippage from the C-corps on net unit growth and pipelines, but unit growth was +4.1% Y/Y and pipelines were up sequentially +3% Q/Q. The one place with some evidence of softness is in low-end Economy chain scale) WH, CHH). Labor is still a challenge but the hiring environment is generally improving at the margin.

Industry Backdrop & Investment Considerations

The global lodging business is a highly fragmented industry. Marriott International, the world's largest hotel company, accounts for just 7% of total global rooms, followed by Intercontinental Hotels Group, Hilton Worldwide and Wyndham Worldwide, all at just over a 4% share with more than 700,000 rooms each. In the U.S., which is the world's most developed and branded hotel market, no single company currently makes up more than 15% of total rooms.

Total U.S. travel is a $1.1 trillion market, with corporate travel representing about 1/3 of that and Lodging equal to 18% or $242B. Lodging demand is highly cyclical, but it also grows substantially over time. Corporate travel represents 46% of total hotel spending.

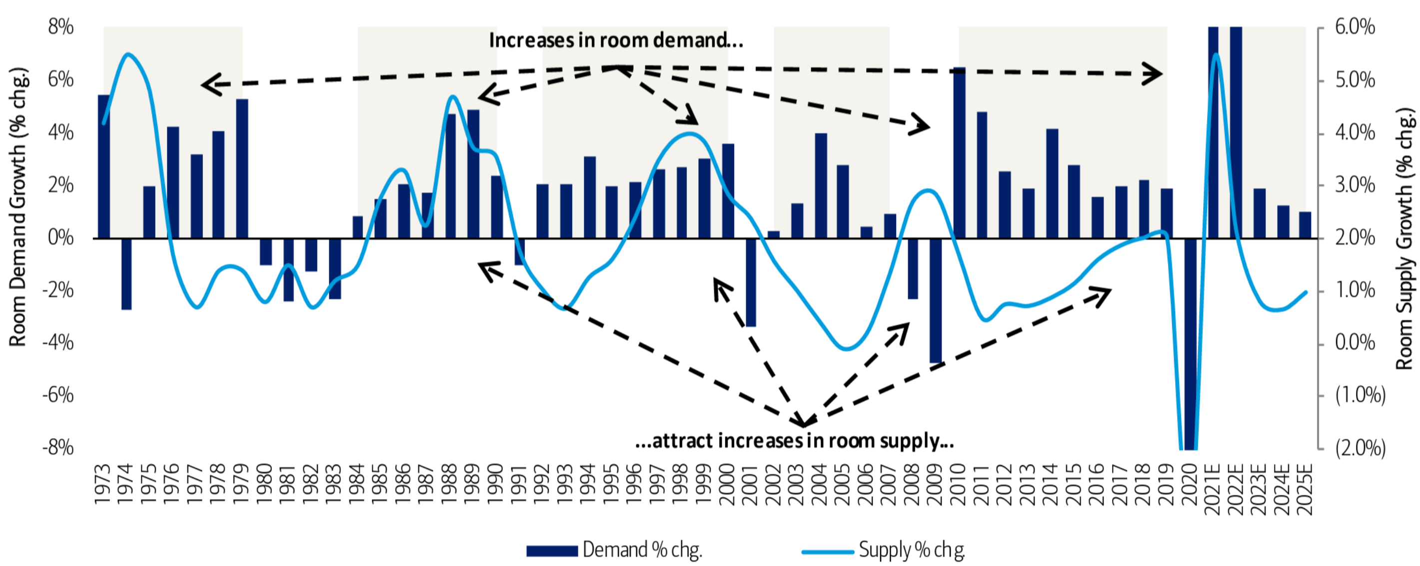
Demand in the lodging cycle moves with the U.S. economic cycle and tends to be in lock step with to slightly lag the overall U.S. economy. Importantly, while leisure makes up a significant proportion of lodging room nights, lodging cycles and indicators are much more highly correlated with business indicators (S&P profits, non-farm payrolls) than consumer indicators like consumer confidence or retail spending. Lodging stocks tend to peak before RevPAR peaks as the stock market tends to lead the economy while RevPAR is coincident with or lags the economy.

Company Name	Marriott	Hilton	IHG	Hyatt	Wyndham	Choice
Current Hotels	7,856	6,893	6,028	1,194	9,000	7,000
Current Hotel Rooms	1,451,735	1,086,520	882,897	290,987	818,900	574,888
Current Timeshare Rooms	22,701	11,801	0	1,038	3,842	0
Room Pipeline	495,000	413,000	278,275	113,000	208,000	83,000
Pipeline as % of Current System	34%	38%	32%	39%	25%	14%
% of Pipeline International	51%	60%	65%	59%	62%	11%
Operating Statistics						
Net Unit Growth (2019)	4.9%	6.4%	5.6%	11.6%	2.6%	3.0%
Net Unit Growth (2022)	3.0%	4.9%	N.M.	14.5%	1.9%	-5.8%
Absolute Systemwide RevPAR (2019)	$117.10	$109.33	$76.89	$138.31	$40.92	$44.52
Owned EBITDA Growth	-10.0%	10.5%	N.M.	2604975.0%	20.9%	0.0%
Adjusted EBITDA (2019)	$3,575	$2,308	$329	$754	$613	$365
2022E Adjusted EBITDA Margin	71.9%	67.5%	N.M.	25.1%	78.8%	74.0%
2022E Net Leverage	2.5x	3.2x	N.M.	3.4x	2.9x	0.6x
2019 Geographic Earnings Mix						
US	66%	75%	52%	35%	70%	95%
Asia Pacific	14%	8%	8%	12%	11%	1%
Europe	10%	10%	22%	6%	8%	1%
Americas	6%	4%	18%	45%	8%	3%
Middle East / Africa	4%	3%	0%	2%	2%	0%
Business Model Earnings Mix (pre-corporate overhead)						
Owned/Leased (including JV's)	8%	8%	3%	44%	0%	3%
Management/Franchise Fees	92%	92%	97%	56%	100%	97%
2019 Chain Scale Exposure (by systemwide room count)						
Luxury	11%	6%	10%	34%	0%	0%
Upper Upscale	43%	26%	2%	45%	0%	0%
Upscale	35%	31%	20%	21%	6%	10%
Upper Midscale	10%	36%	64%	0%	17%	38%
Midscale	0%	2%	4%	0%	25%	33%
Economy	0%	0%	0%	0%	51%	19%

Indicators, Metrics & Stock Selection Framework

RevPAR is an indicator often used in the Hotel/Resort space as a key performance indicator and has the highest correlation with changes in employment while Average Daily Rate (ADR) is seen equally as important. Total Available Rooms, Average Occupancy Rate, and Gross Operating Profit Per Available Room are other metrics of note. STR Global is a provider of industry data that can be helpful staying on top of trends. Lodging is highly cyclical and very correlated (80%) to employment, but not correlated to house prices (2%).

Long-term Lodging cycles are characterized by long periods of demand growth and short sharp declines; usually caused by demand shocks



Valuation & Comps

Avg. 2023E EV/EBITDA by segment: Lodging C-Corp 13.3x, Lodging REIT 10.2x, and Leisure 9.6x

			Dividend		Total Ent.	EV to Adjusted EBITDA			Price/ EPS or FFO		FCF Yield/ Cap Rate		Net Leverage	
Company	Rating	YTD Return	Yield	Mkt Cap	Value	2022E	2023E	Recovery	2022E	2023E	2022E	2023E	2022E	2023E
Lodging C-Corp														
Hilton Worldwide [3]	BUY	-18.7%	0.5%	35,386	43,096	17.7x	14.8x	18.7x	29.0x	22.7x	3.5%	5.2%	3.2x	3.0x
Marriott International	BUY	-7.2%	0.0%	50,066	59,004	15.9x	13.3x	16.5x	23.8x	18.6x	4.3%	5.7%	2.4x	2.4x
Hyatt Hotels Corp	BUY	-6.7%	0.0%	9,064	12,593	13.2x	10.2x	16.7x	NM	NM	5.9%	5.9%	2.7x	1.7x
Choice Hotels	BUY	-26.7%	0.1%	6,352	6,683	14.8x	13.9x	17.5x	23.6x	19.3x	3.6%	5.0%	0.6x	1.6x
Wyndham Hotels	BUY	-27.0%	2.1%	6,120	7,825	12.9x	12.1x	12.7x	18.1x	16.6x	6.6%	6.9%	3.0x	3.1x
C-Corp Average		-18.7%	0.1%	9,064	12,593	14.8x	13.3x	16.7x	23.7x	19.0x	4.3%	5.7%	2.7x	2.4x

Management Commentary

Marriott (MAR) on demand…. "But as we've talked about, we've been really pleased with the resilience of demand and the strength of it across the business segments albeit with business transient a bit behind the others but still improving. And we look, for example, at the month of October, and despite the reality that we clearly have an uncertain macroeconomic environment as we move into '23, we continue to see really strong demand. So kind of across the board, we continue to see kind of the power of people's love for travel, pent-up demand, pent-up savings, recovery in certain markets. Asia Pacific outside of China, for example, continues to make great progress Europe also just absolutely screaming with the weaker pound and euro. And then as you look at the rate component of that, it continues to be very strong on the group side, which is a good reminder that right now, groups are basically being willing to trade flexibility for price. And we see that trend continuing, which I know we're going to -- you're going to want to talk about kind of how we see things next year, and that's one of the elements that does make things a bit uncertain just because there's so much more in the year for the year bookings."

Hilton (HLT) on strong rates…. "ADR also continued to strengthen, improving quarter-over-quarter and up 11% versus 2019. Rates across all segments surpassed 2019 levels with leisure transient rates up in the high teens in both business transient and group up in the mid-single digits. All of this translated into third quarter system-wide RevPAR growth of approximately 30% year-over-year and 5% compared to 2019 levels, with each month surpassing prior peaks. We expect business transient RevPAR to continue to see gradual recovery, primarily driven by rising demand as companies encourage their people to get back on the road. Despite near-term macro headwinds, we're not seeing any signs that fundamentals are weakening. Rising demand, coupled with historically low industry supply growth, should continue to drive strong pricing power. Consumers are shifting back to spending on experiences, international borders are reopening and pent-up demand is being released across all segments. Consumers still have an estimated $2.4 trillion of excess savings accumulated during the pandemic, or approximately 55% more in their checking and savings accounts than they did in 2019. Additionally, according to a recent global Hilton study, 85% of business travelers hope to travel as much or more next year."

OptionsHawk Executive Summary & Focus Stocks

Hilton (HLT) remains the preferred lodging name with its capital-light model and solid growth outlook with upward revisions. **Choice (CHH)** looks rich on valuation with lower growth and exposure to lower income consumers who will pull back spending. **Hilton Grand (HGV)** looks cheap on the timeshare space and screens favorably to VAC. There are no real standout small caps with large caps preferred in this group.

Travel & Leisure – Casinos & Gaming

Components: LVS, MGM, CZR, WYNN, CHDN, BYD, PENN, DKNG, RRR, MLCO, MCRI, GDEN, BALY

International & Private Peers

Intro

The casino/gaming group is generally first broken down into a regional basis so Vegas, Regional, Macau, and now Online a newer emerging category.

The casino group is one I favored in 2H22 on the potential 2023 surge coming with strong growth seen as Macau bottoms and China reopening being a huge potential catalyst. Vegas and Regional are facing tougher comps but demand continues to run strong. Promotional activity continues in Digital with the land-grab. The eroding Macro backdrop could present some risks to earnings estimates in the US. US gross gaming revenue (GGR) may contract in the year ahead as consumer spending slows and share of wallet for gambling reverts closer to historical levels. Casinos were historically viewed as "recession proof" until dramatically disproven in the 2008-09 recession. In Macau/Singapore, changes to the regulatory environment will permanently impair VIP spend, but a recovery in mass is expected to take place similar to what we saw in the US. There is still uncertainty on 1) the actual timing of reopening, 2) China geopolitics and 3) capital requirements in the market that could weigh on free cash flow and capital returns.

US OSB/iGaming gross gaming revenue is expected to grow 23% annually from 2022-25 to a $22.5B total addressable market as rising participation and frequency of betting drive higher share of wallet to converge with mature markets. Inflection in profitability may be a key catalyst as promotions and marketing rationalize with fewer new state launches.

Industry Backdrop & Investment Considerations

The gaming industry is characterized by a high degree of competition among a large number of operators, including land-based casinos, riverboat casinos, dockside casinos, video lotteries, video gaming terminals at taverns in certain states, sweepstakes and poker machines not located in casinos, Native American gaming, emerging varieties of Internet and fantasy sports gaming, increased sports betting and other forms of gaming.

Overview of gaming companies and key operating metrics

	LVS	WYNN	MGM	CZR	BYD	RRR	PENN	CHDN
Company Overview								
Operator type:	WholeCo	Mixed (WholeCo/OpCo)	Mixed (WholeCo/OpCo)	Mixed (WholeCo/OpCo)	Mixed (WholeCo/OpCo)	WholeCo	OpCo	WholeCo
Number of Casino Operations	6	5	29	46	28	16	44	25
Properties/Brands	Venetian; Sands	Wynn; Encore	MGM Grand; CityCenter; Bellagio; Mandalay Bay, Cosmopolitan	Harrah's; Caesars Palace; Horshoe; Tropicana (AC)	Sam's Town; Orleans; Kansas Star; Aliante	Station Casinos, Wildfire, Red Rock Resort	Hollywood, Barstool	Churchill Downs Racetrack; Kentucky HRMs; Rivers Des Plaines (JV)
2023E Operating Statistics								
2023E Total Net Revenue	$8,637	$5,497	$14,115	$10,495	$3,576	$1,659	$6,666	$2,394
Revenue Growth (vs. 2019)	-26%	-17%	12%	1%	8%	-6%	26%	80%
% Gaming (2021)	68%	56%	55%	61%	80%	71%	81%	44%
% Non-Gaming (2021)	32%	44%	45%	39%	20%	29%	19%	56%
2023E Adj. EBITDAR	$3,111	$1,666	$4,397	$4,004	$1,377	$739	$2,056	$1,028
2023E EBITDAR Margin	36%	30%	31%	38%	39%	45%	31%	43%
2019 EBITDAR Margin	39%	26%	24%	27%	27%	24%	30%	34%
2023E Margins vs. 2019A	-3%	5%	7%	11%	12%	21%	1%	9%
2023E EBITDA by Geography								
Las Vegas	0%	44%	65%	49%	37%	100%	0%	0%
U.S. Regional	0%	14%	26%	50%	63%	0%	100%	100%
Macau	56%	44%	9%	0%	0%	0%	0%	0%
Singapore	44%	0%	0%	0%	0%	0%	0%	0%

Macau is a massive market estimated at $38B in 2019 while Las Vegas was just $7B. However, Macau EBITDA is just 1.6X Las Vegas as it operates at much lower margins and less contribution from non-gaming revenues. Gaming is 92% of Macau revenues and just 28% of Vegas.

The gaming market is also broken into sub-segments VIP and Mass markets. The industry is driven by tourism/travel as well as increased capacity via hotel supply. The US gaming industry does $75B in gross gaming revenues (GGR) with tribal gaming accounting for 45% and growing a bit faster than commercial gaming.

The estimated TAM for online sports betting in 2033 is $37.5B representing a 40% CAGR from the 2019 base, a massive long-term growth industry. i-Gaming has an even larger potential TAM but currently estimated at a $15.5B market for 2033 growing at a 28% CAGR.

The crosscurrents of a healthy consumer backdrop and structural changes from the launch of online sports betting offer a bullish fundamental set-up for the gaming industry in aggregate.

The regulatory positive tailwinds with sports betting in the US is a growth driver across the gaming sector while Macau has continued to struggle for the large casino operators. Regional gaming plays are benefitting from expanded legalization allowing for launches of new mobile betting platforms. The main themes currently in the group include a Macau recovery on hold due to government restrictions, leisure on a slow and steady recovery in Vegas, regional gaming margins moving structurally higher, and major enthusiasm in iGaming & sports betting.

A digital shift is underway as marketing drives awareness and increased share of wallet, with potential for adjacencies in media/advertising, ecommerce, and more if apps can develop a large user base. These factors should drive opportunities for brick-and-mortar casinos to rethink their business models by collecting, analyzing, and leveraging more data, tailoring the product/servicing offering, and attracting younger consumers while still enhancing engagement among core consumers.

Indicators, Metrics & Stock Selection Framework

Gaming stocks historically outperformed the S&P 500 in both rising interest rate and inflationary environments.

EV/EBITDA, EBITDA Growth, FCF Yield, CROCI

Valuation and Comps

U.S. Gaming trades at 7.7x 2023E EBITDA (7.4x ex sports) with 12.3% FCF ex sports ; REITs trade at 14.5x 2023E EV/EBITDA

		2022 YTD	Dividend	Equity	Ent.	Ent. Value / Adj. EBITDA			2023 Digital Value		FCF Yield			Net Leverage	
Company	**Rating**	**Price Return**	**Yield**	**Mkt Cap**	**Value**	**2022E**	**2023E**	**'23 Ex. Sports**	**Total**	**Per Share**	**22E**	**23E**	**Ex. Sports**	**2022E**	**2023E**
Gaming - U.S. (Shaun Kelley)															
Las Vegas Sands	U/P	-2.6%	0.0%	$28,001	$41,894	NM	12.9x	12.9x	$0	$0	10.4%	5.9%	5.9%	10.7x	2.6x
Wynn Resorts	NEUTRAL	-29.2%	0.5%	$6,910	$17,332	23.6x	9.5x	9.5x	$87	$1	0.6%	10.3%	10.5%	13.0x	4.3x
MGM Resorts	NEUTRAL	-26.6%	0.0%	$13,829	$30,320	8.0x	6.5x	5.8x	$3,000	$7	9.6%	10.5%	13.5%	4.1x	3.2x
Penn National	BUY	-38.6%	0.0%	$5,586	$13,842	6.8x	6.8x	6.3x	$1,187	$7	11.6%	13.6%	17.3%	4.1x	4.2x
Caesars Entertainment	BUY	-53.8%	0.0%	$9,247	$30,989	8.0x	7.4x	7.0x	$1,791	$8	16.0%	16.7%	20.7%	5.6x	5.1x
Boyd Gaming	BUY	-16.6%	0.8%	$5,993	$9,183	6.7x	6.5x	6.2x	$413	$4	12.0%	12.8%	13.8%	2.3x	2.2x
Red Rock Resorts	U/P	-28.1%	2.5%	$4,160	$6,300	8.6x	7.9x	7.9x	$0	$0	10.7%	10.7%	10.7%	3.5x	3.5x
Churchill Downs	BUY	-16.8%	0.3%	$7,761	$9,761	13.2x	11.3x	11.3x	$0	$0	8.2%	11.0%	11.0%	2.2x	3.6x
Gaming U.S. Average		**-27.4%**	**0.2%**	**$7,335**	**$15,587**	**8.0x**	**7.7x**	**7.4x**			**10.6%**	**10.8%**	**12.3%**	**4.1x**	**3.6x**

Digital gaming per share build; the group has an average "core" EBITDA multiple of 6.9x and FCF yield of 15%

	DraftKings	Penn National	MGM	Caesars	Boyd Gaming	Wynn Resorts
Online Market Size (2023)	$13,978	$13,978	$13,978	$13,978	$13,978	$13,978
Online Market Size (2025)	$19,871	$19,871	$19,871	$19,871	$19,871	$19,871
Illustrative Market Share	20-30%	3-5%	15-20%	5-8%	20-30% (via Investment)	0-2%
2023E Revenues	$2,797	$619	$2,097	$934	$2,883	$105
2025 Implied/Potential Revenue	$4,027	$596	$2,981	$969	$4,098	$149
Multiple Credit	100.0%	67.0%	100.0%	67.0%	100.0%	50.0%
2023 Revenue Multiple	2.9x	1.9x	2.9x	1.9x	2.9x	1.4x
2025 Revenue Multiple	2.1x	1.4x	2.1x	1.4x	2.1x	1.0x
Implied Value (2023)	$8,005	$1,187	$3,000	$1,791	$413	$87
Ownership	100.0%	100.0%	50.0%	100.0%	5.0%	58.0%
Shares Outstanding	473	172	415	214	107	115
Value/Share	**$16**	**$7**	**$7**	**$8**	**$4**	**$1**
Current Share Price	**$16**	**$32**	**$33**	**$43**	**$55**	**$60**
Share Price Ex. Sports Betting		$25	$26	$35	$51	$59
Enterprise Value		12,929	25,896	28,259	8,489	15,773
EBITDAR (Sales for DKNG)		2,062	4,465	4,049	1,377	1,667
FCF/Share		$3.73	$3.48	$7.15	$7.00	$6.23
Core EV/EBITDAR		**6.3x**	**5.8x**	**7.0x**	**6.2x**	**9.5x**
Core FCF Yield		**14.9%**	**13.5%**	**20.5%**	**13.8%**	**10.5%**

Management Commentary

Las Vegas Sands (LVS) on Macau…. "We are big believers in Macau as a world center of tourism and leisure. We have been the biggest investor and operated non-gaming businesses over the past 2 decades in Macau. We absolutely welcome the opportunity to invest even more in nongaming products and offerings in Macau. We have great confidence in Macau's tourism recovery as long-term growth prospects as we do most of our -- we'll do our utmost to support Macau's economic diversification and its evolution as Asia's leading destination for MICE and leisure visitors. We consider our existing portfolio of resorts in Asia to be an ideal platform for growth in the years ahead. In addition, we continue to pursue opportunities to develop new large-scale land-based destination resorts in both the U.S. and Asia."

MGM (MGM) on its Digital business…. "BetMGM remains the clear leader in iGaming with a 29% market share, and BetMGM commands 22% share in active markets when combining U.S. sports betting and iGaming. As we hit the halfway point of the NFL season, we're encouraged by the preliminary metrics, reinvestment has remained within our expectations and market appear to be acting more rationally. As BetMGM shared in May at its Investor Day, our strategy is to focus on profitability by allocating spend to geographies with the highest ROI and targeting bonusing. We believe this is being executed exceptionally well. Overall, customers who play online at our properties have increased engagement and our lower cost per acquisition which reflects the operating leverage we can and will drive into the future. BetMGM is firing on all cylinders, demonstrating tremendous growth and remains on track to achieve profitability during 2023. We also expect further global digital growth with LeoVegas, MGM China and Macau market are showing some productive signals, and we believe we are well positioned with respect to licensing renewals."

Caesar's (CZR) on Regional tailwinds…. "Regional is obviously quite strong as well, had a little bit of margin improvement there. Strongest third quarter that we've ever had in regionals. And then we've got, as Anthony touched on, we've got Lake Charles coming. We've got temporary casinos in Columbus, Nebraska; Danville, Virginia that will hit next year. We've got the completion of the Atlantic City spend as well, and the Harrah's Hoosier Park in Indianapolis -- outside Indianapolis should finish by the middle of next year. So a number of tailwinds cash that you allowed us to invest as shareholders that you're going to see the fruits of going into the rest of '22 and into '23. In digital, October digital inflected to positive EBITDA for us. So we are extremely pleased that's 12 months ahead of the schedule that we anticipated."

OptionsHawk Executive Summary & Focus Stocks

Of the five largest market cap names **Las Vegas Sands (LVS)** looks best positioned for the Macau recovery and upwards earnings cycle along with WYNN. **MGM** is the value name trading very cheap and having levers to allocate capital. **Churchill Downs (CHDN)** is the preferred own of the smaller names with the Regionals facing weaker numbers moving forward. **DraftKings (DKNG)** remains in trouble with the lack of profitability and promotional activity trying to compete against larger entrants. **Caesars (CZR)** has always been a favorite operator in this space and continues to look better than the other regionals.

Travel & Leisure – Gaming Equipment

Components: LNW, IGT, SRAD, EVRI, GENI, ACEL, RSI, INSE, AGS, NGMS

International & Private Peers: Aristocrat, Konami

Intro

The same trends impacting casinos flow through to the equipment/service providers so investments into the digital space remain a focus while the replacement cycle is likely to slow in the US. SRAD is an intriguing tech play but sports rights cost inflation is weighing on margins. LNW is a turnaround story gaining share across multiple gaming categories. NGMS is an interesting play in the growing iLottery and iCasino space.

Industry Backdrop & Investment Considerations

ACEL outlines that "Gaming as a Service" is a large TAM and the fastest growing segment in gaming. DKNG estimates the US sports betting industry is a $23B market at maturity and iGaming is a $40B TAM. The global casino gaming equipment market is estimated at $70B in 2020 and seen reaching $173B by 2027, growing at a 13.8% CAGR.

The new entrants to the sports analytics/data realm are looking to play a role in two massive markets of gaming and media delivering a more immersive experience for fans. The collection of high quality, live sports data has become indispensable for sportsbooks as in-game betting has continued to grow rapidly across the world.

It remains the early innings of the rollout of a $30B+ US digital gaming industry and the Latin American mobile gaming market is expected to triple in size from 2020 to 2026. Sports betting is the fastest growing category within the broader gaming market. The global sports betting market is projected to grow from $47 billion in 2021 to $81 billion, representing a combined 2025 market estimate for the rest of the world plus a United States market estimate for 2030.

Indicators, Metrics & Stock Selection Framework

EV/Sales, EV/EBITDA, Revenue CAGR, EBITDA CAGR

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Gaming Equipment					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
LNW	Light & Wonder Inc	6.2B	9.96X	10.15%	6.38%	36.27%	-7.58%	(1.176%)	4728.75%	1.59%	2.98X
IGT	International Game Technology PLC	5.0B	6.47X	4.58%	-0.97%	37.92%	6.27%	3.03%	34.06%	-0.79%	3.38X
SRAD	Sportradar Group AG	3.1B	21.32X	24.73%	22.47%	20.4%	19.93%	3.86%	10.06%	6.08%	-1.90X
EVRI	Everi Holdings Inc	1.4B	5.53X	4.04%	5.08%	47.3%	11.74%	17.87%	-8.17%	6.97%	1.86X
RSI	Rush Street Interactive Inc	0.8B	-8.60X		18.32%	(8.43%)	-12.17%	7.6%	162.50%	-4.10%	3.98X
ACEL	Accel Entertainment Inc	0.7B	6.03X	9.57%	9.26%	15.4%	16.07%	22.5%	-3.60%	-1.64%	1.60X
NGMS	NeoGames SA	0.4B	9.18X	9.72%	55.38%	28.27%	6.91%	27.74%	-262.50%	140.77%	1.63X
INSE	Inspired Entertainment Inc	0.3B	5.53X	9.0%	10.85%	37.12%	7.66%	#######	-150.28%	35.26%	2.12X
AGS	Playags Inc	0.2B	5.28X	3.65%	4.59%	44.04%	70.39%	(3.983%)	-408.33%	4.85%	3.78X

Management Commentary

Light and Wonder (LNW) on turnaround…. "With the heavy lifting done around the transactions and the balance sheet, we are now a rebranded company with 3 complementary business units and our R&D engine at the center of our universe. With a sharpened focus and a clear road map to win, we are executing on our growth strategy to take share. With games and platforms at our center, we are harnessing one of our key competitive advantages, robust data analytics can play insights from across the organization to enhance our game product road map and our success. In Gaming, we continue to build on our momentum, making great progress in delivering gains in each business line. And with competitive cabinets in each critical segment, enhanced systems and table offerings, we are well positioned to benefit as operators continue to invest in their floors. Cashless was again a topic of interest this year at G2E, and our leading iVIEW 4 hardware continues to drive growth in our systems business and cashless enablement. Demand for the iVIEW 4 product remains strong, with unit sales nearly doubling year-over-year and is now deployed across approximately 2/3 of the swap machines connected to our systems platform. Moving to iGaming. We have an unrivaled offering for our partners and players. Our land-based and digital-native content, unmatched iGaming platform and leading PAM enables us to participate in every part of the value chain. In the quarter, U.S. growth remained strong with revenue up approximately 39% year-over-year, driven by overall market GGR growth."

International Game Tech (IGT) on sports betting and scaling…. "IGT's proposition becomes even more compelling with world-class data analytics and user engagement tools that can create a real-time personal offering and recommendations for individual players. For sports betting, IGT solutions are powering over 80 sports books and the portfolio of turnkey customers continues to expand. The new peak bar top with sports betting cabinet, we just introduced the G2E is getting a lot of attention, including winning the land-based Product of the Year Award at the 2022 Global Gaming Awards in Las Vegas. The digital embedding segment is already profitable even as we are making outsized investments for future growth. The SaaS-like business model means that profit margin should expand as we gain scale. You should see that dynamic unfolding beginning next year as we continue to work on the iSoftBet integration for the rest of 2022."

Sport-Radar (SRAD) on recession impact…. "To address that, I would like to spend a few minutes on Sportradarâ€™s growth model, which is based on four levers: number one, Sportradar serves a global betting market that is expected to grow 11% annually throughout 2027. Historically, the global betting markets have grown throughout all crisis with the only exception being in 2020 when due to the pandemic, a large number of sports competition were suspended. Second, Sportradar consistently managed to grow almost 3x faster than the underlying market due to our ability to open cross-sell customers, moving them higher up the value chain and expanding into new regulated markets. Our model enabling us to grow 6% in 2020 despite the underlying betting market contracting by around about 11%. Number three, based on the growing revenues, we can expand our margin by leveraging significant scale in our business model with a streamlined organization for global content acquisition, global product development and global technology and infrastructure. And lastly, our profitability generates significant growing cash flow that we invest into our future, expanding our product portfolio, geographical reach and increasing our addressable market."

OptionsHawk Executive Summary & Focus Stocks

We are dealing with all small caps in this group and **Light & Wonder (LNW)** is an attractive turnaround story with its transformation. **Sportradar (SRAD)** is the top growth play and down to 21X EBITDA, a name I believe in the long-term story and potential to grow much larger. **Inspired (INSE)** and **Neo (NGMS)** are two intriguing small cap growth names already profitable that screen well as M&A targets in this group.

Travel & Leisure – Theme Parks & Cruises

Components: DIS, RCL, CAR, CCL, MTN, NCLH, HTZ, SEAS, FUN, SIX

International & Private Peers

Intro

This is a smaller group consisting of theme parks & resorts, cruise-liners, and car-rentals. MTN is one of the more interesting names with its ski resort moat with the bull case revolving around pricing power, cost leverage and a transition to a more recurring revenue model while EBITDA has slowed, and M&A opportunities have faded. RCL recently held an Investor Day and sees plenty of upside from the cruise industry increasing its low penetration and closing the value gap to land-based holidays. Cruise companies have noted strong booking momentum for 2023/2024 as the industry is still recovering from the pandemic and pricing remains very strong.

Industry Backdrop & Investment Considerations

Amusement parks are poised to benefit from a shift toward an "experience economy", face no threat from e-commerce. High barriers to entry limit competition and companies have multiple long-term organic growth opportunities. However, the industry is cyclical with fundamentals tied to employment. Over the past 5 and 10 years the industry has grown 7% and 5%, respectively, well outpacing GDP growth. Revenue across the industry is relatively evenly split between destination parks (53%) and regional parks (47%). Despite high capital intensity and cyclicality, amusement parks on average boast the highest EBITDA margins in consumer. Domestic supply growth in the amusement park industry is virtually non-existent, a positive for incumbents. Park supply per capita has actually been declining for the last 10-15 years.

Snow sports tourism contributes about $20B to the U.S. economy each year.

The cruise industry was one of the fastest growth areas of leisure travel, revenues growing from approximately $15.7B in 2010 to an estimated $31.5B in 2020 before COVID. The cruise industry has never really enjoyed long-run pricing power or great through-cycle ROCE.

The car rental industry was valued at $88B globally in 2018. Car rental volumes tend to be associated with the travel industry, particularly airline passenger volumes, or enplanements, which in turn tend to reflect general economic conditions. The operations are also seasonal, with the third quarter of the year historically having been the strongest due to the increased level of leisure travel during the quarter. The car rental industry is an early-cycle outperformer whose business model is dependent upon several factors outside of its own control – namely growth in leisure/corporate travel as well as supply/demand for automobiles. The three largest drivers of Rental Car company profitability are pricing, vehicle cost, and volumes. In the US, the rental car industry is dominated by three players (Enterprise, Hertz, and Avis) that amount to 95% of the market.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA Margins, Revenue Growth, FCF Yield, CROCI, EBITDA CAGR

Valuation and Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EBITDA CAGR (FY23 to FY24)	Revenue CAGR (FY1-2)	EBITDA Margin	FCF Yield (Mkt. Cap)	ROIC	EPS Est. Change	Revenue Est. Change	Debt /EBITDA
Theme Parks and Resorts					#VALUE!		#VALUE!		#VALUE!	#VALUE!	
DIS	Walt Disney Co	171.7B	14.58X	21.86%	7.26%	11.59%	2.66%		-7.85%	6.02%	4.04X
RCL	Royal Caribbean Cruises Ltd	14.1B	53.07X	21.92%	44.12%	24.8%	-11.16%	#######	112.07%	-4.33%	7.22X
CCL	Carnival Corp	11.2B	-23.96X	22.85%	73.56%	7.04%	-51.12%	#######	85.83%	-16.53%	22.66X
MTN	Vail Resorts, Inc.	10.6B	13.55X	6.95%	5.30%	(34.983%)	5.47%	3.79%	9.88%	18.87%	-4.20X
CAR	Avis Budget Group Inc	7.9B	6.29X	(6.071%)	-1.96%	41.16%	#VALUE!	11.95%	134.04%	14.86%	3.02X
NCLH	Norwegian Cruise Line Holdings Ltd	6.4B	-30.56X	19.84%	76.67%	1.74%	-19.50%	#######	230.97%	-13.41%	107.02X
HTZ	Hertz Global Holdings Inc	5.3B	8.60X	(14.893%)	3.72%	24.76%	#VALUE!	20.61%	5.22%	3.11%	5.93X
SEAS	SeaWorld Entertainment Inc	3.5B	7.57X	3.67%	2.54%	48.51%	8.29%	15.55%	-2.21%	0.65%	1.80X
FUN	Cedar Fair, L.P.	2.2B	7.87X	4.14%	2.15%	42.94%	5.33%	(2.644%)	48.38%	0.60%	1.52X
SIX	Six Flags Entertainment Corp	1.8B	10.07X	8.84%	6.57%	44.79%	13.09%	9.91%	-39.16%	-18.00%	2.61X

Management Commentary

Royal Caribbean (RCL) on business trends…. "As our third quarter results clearly demonstrate the strength of our vacation platform, which includes our leading global brands, the best and most innovative ships in the industry and a powerful and nimble commercial apparatus, coupled with strong execution by our operating teams have delivered another quarter of strong performance that exceeded our expectations. Our entire fleet is operating globally in our key destinations. Demand for our experiences was very strong, and we achieved 96% load factors overall, with the Caribbean at close to 105% at record pricing and high satisfaction scores. Our formula for success is based on moderate capacity growth, moderate yield growth and strong cost discipline. Overall, across markets, brands and products, we continue to see a financially healthy, highly engaged consumer with a strong hunger to dream and seek a variety of vacation experiences. Our commercial apparatus is seeing elevated booking activity across channels as we help our customers design their dream vacations. Our guests are willing to spend more than ever with us to create those memories. All this is translating into strong booking activity. During the third quarter, we saw both strong demand for close-in sailings and accelerating demand for sailings in 2023. We received twice as many bookings for 2023 sailings in Q3 as we did in Q2, resulting in considerably higher booking volumes than during the same period for 2019 sailings. The value proposition of cruising remains incredibly attractive, and we have an opportunity to close the gap to other land vacation alternatives as we grow our addressable market. We continue to expect the business to accelerate as we close out 2022 and set a strong foundation for us to deliver record yields and adjusted EBITDA in 2023."

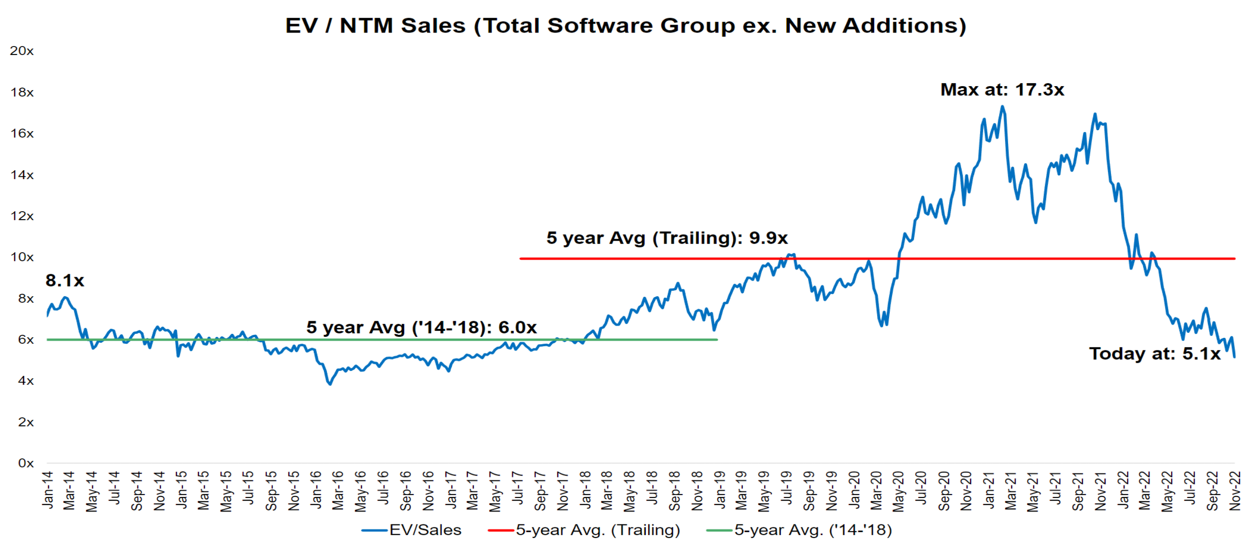
SeaWorld (SEAS) on industry trends and recession performance…. "As you can see, we believe our business demonstrated resiliency in both 2001/2002 recession and the 2008/2010 recession. As we have discussed before, we offer tremendous value to our customers. And given our attractive value proposition and the drive-to nature of our parks and how our business has performed in past recessionary periods, we expect it will perform relatively well in future recessionary environments. So what I would tell you is what I do look at is the growth in the consumer spending in our parks. I think that's a pretty good indicator that people are coming out even in a high inflationary environment, and they're spending money in our parks. And that's a testament to the investments we've made in our parks, the events we're doing, the offerings that we have. And so I feel good about our ability even in these last couple of quarters where we've seen inflationary impacts. Obviously, people are still coming out and spending in our parks. On pricing, we continue to see strong consumer spending in our parks. I think we've done some good things around what we offer. We posted a slide and I talked about it about the value of coming to our parks relative to maybe other entertainment options. It's a very good value to come to one of our parks. And I think that gives me confidence that we can continue to showcase that value and probably gives us opportunities, obviously, to grow pricing."

OptionsHawk Executive Summary & Focus Stocks

Disney (DIS) was previously discussed in the Streaming Media group as a top name at attractive valuation. **Royal Caribbean (RCL)** should continue momentum with upward revisions on strong bookings and pricing as the industry emerges stronger out of the pandemic. Car Rentals look to be great shorts led by **Hertz (HTZ)**. Of the smaller Parks names **Vail (MTN)** a former compounder trades rich considering pedestrian growth while **Six Flags (SIX)** screens most attractive at 10X EBITDA with solid growth, margins and FCF.

Technology

Tech was a sector that was hit the hardest in 2022 due to compressing multiples that reached bubble-type levels during the 2021 liquidity surge and with the prospects of higher rates investors shed unprofitable companies in favor of company's earnings profits and cash flow. Software was a major spot of weakness containing many long-duration companies and now also facing some IT budget cuts dampening demand. Software continues to see a ton of forward growth potential, but companies have to be more mindful of the environment, slowing spending and focusing on operational efficiencies. The Digital Transformation market is seen surpassing $1 trillion by 2025 at a 16.5% CAGR. The $1 trillion IoT market is seen returning to double digit growth with an 11% CAGR through 2024. Over the next 5 years, all growth in traditional tech spending will be driven by just four platforms: cloud, mobile, social and big data/analytics. Meanwhile, cost savings generated by cloud and automation will see more spending diverted towards new technologies such as AI, robotics, AR/VR, and blockchain. Valuations are not back at more acceptable levels where stock-picking will be critical to identify the best-in-class operators in a tougher backdrop. M&A has picked up sharply in the group with a lot of strategic PE buyers showing the group is far from dead and is likely to lead during the next up-cycle.



Digital Advertising was another group that came under pressure with advertising budgets closely tied to GDP as a very Macro-sensitive group while rising competition and Apple privacy policy changes were influential as well.

The Semiconductor cycle remains one of the strongest in history but is starting to show signs of slumping, so investors need to be mindful of inventories and end-markets.

Software – Mega Cap Diversified

Components: MSFT, ORCL, CRM, ADBE, SAP, NOW

International & Private Peers: Sage Group, Constellation Software

Intro

With valuations reset the well-known risks to a slowing demand environment, opportunities are starting to emerge once again across the Software space for companies showing more durable demand and protecting margins. Further, pressures from rising interest rates and the USD are abating as we head into 2023. Near-term capex commentary remains constructive, but the aggregate outlook implies 2023 cloud capex growth decelerates to +8% Y/Y. Initial reading for 2023 budget growth suggests CIOs expect relatively inline growth at +2.8%. Lengthening sales cycles has been a term seen across earnings calls for much of the group.

2023 will likely be characterized by conservative guidance to start the year as leading indicators soften. Companies will certainly be more mindful of expenses in this environment and may slow investing in future growth. This could set up for a strong beat & raise environment in 2H23 as comps ease along with FX and interest rate pressures.

Industry Backdrop & Investment Considerations

Digital Transformation spend reached an inflection point and a large opportunity remains to disrupt legacy markets. Salesforce has outlined a $248B TAM expected to grow at an 13% CAGR through FY25 across Sales, Service, Commerce, Marketing, Platform, Integration, and Analytic sub-segments.

A study by International Data Corporation, or IDC, suggests that by 2023 spending on digital transformation technology globally will reach $2.3 trillion, representing a compound annual growth rate of 17.1% over a five-year period. Digital transformation requires significant modernization of legacy environments, shifting from high cost, labor intensive, and inflexible technology systems to a modern cloud-native architecture.

Digital Transformation drives new multibillion-dollar software categories, including Collaboration, UCaaS, eCommerce, AI, Big Data, DevOps and RPA while potentially increasing adoption rates for established categories such as CRM, HCM, ERP, Vertical Apps, Creative Design, and Business Intelligence.

Key factors that often define best-in-class companies include Founder-Led, Differentiated Tech, Strong Market Share, Structural Market Shifts, and Quality Sales Management Teams.

The total enterprise software addressable market is $1,172B and cloud penetration is ~20% ($234B) in 2020 and is expected to grow at a 22% CAGR through 2025 and reach 53% penetration ($627B). The mix within the Cloud TAM between SaaS/PaaS/IaaS is 63%/12%/25% in 2020E and will reach 66%/13%/21% in 2025.

The SaaS market, which includes Front Office Apps, Back Office Apps, Business Intelligence, Communications/collaboration, IT Operations/Management & DevOps, is currently a $149B market and will grow at a 23% CAGR to reach $412B in 2025.

The PaaS market, which includes Database as a Service, Integration Platform as a Service, Application Platform as a Service is currently a $27B market and will grow at a 25% CAGR to reach $82B in 2025.

The IaaS market, which includes Compute and Storage is currently a $58B market and will grow at a 22% CAGR to reach $133B in 2025.

Indicators, Metrics & Stock Selection Framework

8 KEY FACTORS	TANGIBLE	INTANGIBLE
TAM	Top-down sizing Bottom-up sizing	Is pricing sustainable? Is it a feature or a real market?
SECULAR THEMES	Customers spending more on DX, UCaaS, CPaaS, CCaaS AI and IoT initial use cases	Is it a pull-forward of demand or a permanent shift? Is it a feature or a real secular trend?
ENTRY/EXIT POINTS	Technical analysis Sector historical valuation parameters	When to buy? Rotation or short-term mis-execution? When to sell? Valuation ahead of fundamentals?
LT FRAMEWORK RETURN	Long-term revenue/margins scenarios Compounded return outcomes based on long-term scenarios	Which scenario is more likely? What are possible risk-reward scenarios?
UNIT ECONOMICS	Lifetime value (LTV) calculation Customer acquisition cost (CAC) calculation; LTV/CAC	How does competition impact customer lifetime? How does upsell and cross-sell impact CAC and cost to serve?
PLATFORM/ BEST OF BREED	Diversified revenue mix Best of breed gaining market share	Are there actual synergies between the revenue streams? Can the best of breed "cross the chasm"?
COMPETITIVE MOAT	Revenue per R&D dollar Size of install base	Are there disruptive technologies? Why is the install base demanding bigger price discounts?
ESG	Carbon neutral = data center usage + carbon offsets Company becoming a large platform	What are the social impacts of AI products? What are the regulatory or security breach risks?

Software investing as a blend of quantitative and qualitative factors. For newer companies and emerging markets, typically qualitative overwhelms quantitative, and for established companies and mature markets, quantitative overwhelms qualitative. Recurring revenue models, elevated sales growth, and mission critical technology has often justified high valuations in the software space. Software companies that have been able to demonstrate the ability to develop new products, capture large market share and keep up with digital transformation trends have been the ones to drive compelling software valuations.

Subscription software business models naturally result in high profits in the out years, leaving investors to contend with high-level of uncertainty in the early years. Valuation frameworks in the early stages of the life of a software company are limited to revenue-based multiples. Assuming that unit economics are defensive and sustainable, investors can focus on evaluating the profit potential later in a mature growth state. In other words, after understanding competitive moat, market size, and managements ability to execute among other factors, how large can a software company become over time and what is the likely revenue-margin trade-off at maturity. Any changes in customer acquisition cost, customer support costs, gross margin profile, competitive dynamics, or business model, can have a meaningful impact on the long-term margin profile. However, there are many cloud companies at scale that have proven the power of cloud business models. As the number of at-scale cloud companies has increased, investor sentiment in the software sector has improved.

Customer acquisition costs (CAC) typically increase over time, as businesses move upmarket, expand internationally, and move into adjacencies. CAC, the cost to acquire a new dollar of annually recurring subscription revenue (ARR), is a key measure of efficiency and one of the most important metrics in subscription software. We define customer acquisition costs as TTM GAAP Sales & Marketing expenses divided by net new ARR (Y/Y change in annualized subscription revenue). Lifetime Value aims to capture the discounted value of the $1 in acquired ARR over a typical customer lifetime. We calculate LTV as GAAP subscription gross margin divided by the sum of gross churn and a standardized discount rate (8%). Bringing these together we get the LTV/CAC ratio to derive the net present value of $1 of ARR divided by the cost in obtaining that $1, with higher LTV:CAC indicating greater efficiency in the company's go-to-market motion, and likely pointing to greater potential profitability at scale (all else equal).

Software is unique in that the biggest investment to scale the business longer term is distribution (S&M) versus R&D in the early stages. Gross margins are generally very high and primarily a function of infrastructure hosting costs and secondarily a function of mix of subscription (higher margin) versus services (lower margin). Once the product meets minimum viability of market acceptance, S&M (mostly quota carrying sales) takes over. As companies continue to invest ahead of growth, current measures of profitability often understate the long-term earnings potential of the business, particularly as companies invest heavily to acquire new customers. Investment also includes acquisitions since they usually come with a viable product(s) and an established customer base. With predictable, recurring revenue inherent in many SaaS business models, correspondingly low revenue attrition (or churn) and relatively high economic margins, large upfront investments in customer acquisition are expected to translate to profitability over time, particularly as growth slows and the company reaches maturity.

Net Expansion Rates is another key indicator and is a company's ability to expand within its existing installed base, either through greater volume (seats, usage, etc.), pricing, or additional modules and functionality. As new customer acquisition can be relatively expensive, growth from within the installed base typically carries less friction and costs, bringing higher incremental margins and driving efficiency.

The rule of 40 has become a standard in benchmarking SaaS companies across both dimensions. Simply, the rule of 40, which is comprised of the sum of revenue growth and free cash flow margin, aims to capture both growth and profitability, using 40 as a benchmarking standard.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Mega-Cap Diversified						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
MSFT	Microsoft Corp	1917439	18.93X	9.02X	27.24X	12.97%	15.27%	42.06%	32.86%	1.87%	6.72%
ORCL	Oracle Corporation	220.6B	12.29X	6.13X	51.69X	7.72%	8.76%	46.17%	11.85%	4.21%	17.09%
ADBE	Adobe Inc	158.0B	18.33X	9.01X	22.26X	10.01%	9.46%	45.99%	43.60%	0.12%	-1.31%
SAP	SAP SE (ADR)	136.2B	14.88X	4.55X	32.99X	7.28%	8.57%	29.56%	19.47%	-14.84%	4.76%
CRM	Salesforce Inc	134.8B	13.19X	4.31X	21.51X	10.89%	16.80%	18.69%	19.94%	6.25%	-3.44%
NOW	ServiceNow Inc	84.7B	36.35X	11.36X	39.54X	21.99%	27.08%	25.14%	30.39%	0.14%	-2.19%

Management Commentary

Microsoft (MSFT) on future transformative trends…. "I think there's 2 areas. The first is, there's a lot of buzz in the market right now about the metaverse. And I think most people think of metaverse, they think of gaming or social. But there's actually an industrial side of metaverse that is emerging, that I think is one that is -- has a ton of potential. So if you think -- I talked a little bit about digital twins and the manufacturing. But if you think about being able to blend that physical and digital world in a way that allows you to do things like replicate entire buildings, replicate entire factory floors, being able to then remotely monitor those factories as an example. So being able to replicate, monitor and then actually drive efficiency. When we talk about the industrial metaverse, that's what we're talking about. And so if you think about that, like then you are both saving costs on things like maintenance, being able to be in a proactive state, you are actually able to do things like lower your carbon emissions because you're not flying people all around the world to maintain that factory, and you're able to do things like understand where there is automation that you can apply into the factory to make it more efficient. And so I think the industrial metaverse is something that has huge potential, and I think we're on the very early cusp of realizing that. And so I think that's one that I would say is we'll sit here in however many years, and I think it will be a much more prevalent set of technologies that companies are using because they can be more efficient, they can save costs, and they can be also more sustainable. I put that at the top of the list. And then I think just to bridge on that, I do think mostly because of where the world is going and coupled with regulation, sustainability and how you do -- not only just carbon emissions, but water and waste is another area that is going to be more and more, I think, at the top of everyone's list from priority standpoint."

Service-Now (NOW) on whitespace…. "So one of the things that we always want to do is, at the highest level, I still look at white space in every area. Whether we pick Creator or ITSM even and so on, we still want best-in-class product, period, full stop. So we will continue to invest in R&D for those products. The one word that is not allowed in my team is cash cow because we don't have a cash cow. We have every product line that is growing nicely, and we still have a lot of white space, right? Now in terms of your question on where things are going, like cloud transformation, everybody is dealing with some kind of cloud transformation. So our ITSM and ITOM team, how do we make that easy in this multi-cloud world, not just saying at a superficial level, really thinking about the pain point and doing that hard dollar savings via asset management. The 2 products that have just done a phenomenal job this year despite the market environment is our security operations and risk products. We are replacing a lot of legacy risk solution and doing wall-to-wall enterprise risk in tech, in financial services and in health care. And 5 years ago, I had 10 engineers on it. Now I have 60, and the business is growing. It is the second fastest-growing product line after our asset management product line business. So that's an area that we are going to continue to invest to make sure that -- when we started that product, of course, everybody told me, hey, CJ, it's only a few hundred million dollar product market, blah, blah, spreadsheet has the share. That changed. We've changed that. And then ERP is another area. And then on the core platform with machine learning, process mining, we'll continue to always invest in it."

OptionsHawk Executive Summary & Focus Stocks

This group of giants has three names trading 12-15X EBITDA in ORCL, SAP and CRM. Of those **Oracle (ORCL)** is the cheapest yet offers comparable growth with stronger operating margins and is seeing upward revisions on both EPS and Revenues which is rare in Software in this environment, so it is a preferred name. **Microsoft (MSFT)** and **Adobe (ADBE)** both trade around 18.5X and have very similar profiles though the former is a bit better across the board and is a core Software own. **ServiceNow (NOW)** has the strongest growth profile but trades 36X EBITDA and 39.5X FCF and no longer delivering beat & raise numbers, a potential short for further multiple compression.

Software – Cloud Infrastructure – DevOps

Components: MDB, NET, FSLY, VMW, PD, DDOG, NEWR, DT, SPLK, ESTC, FFIV, SWI, FROG, NTNX, RXT, SUMO, LLNW, AKAM, DOCN, WKME, CFLT, BASE, NABL, GTLB

International & Private Peers

Intro

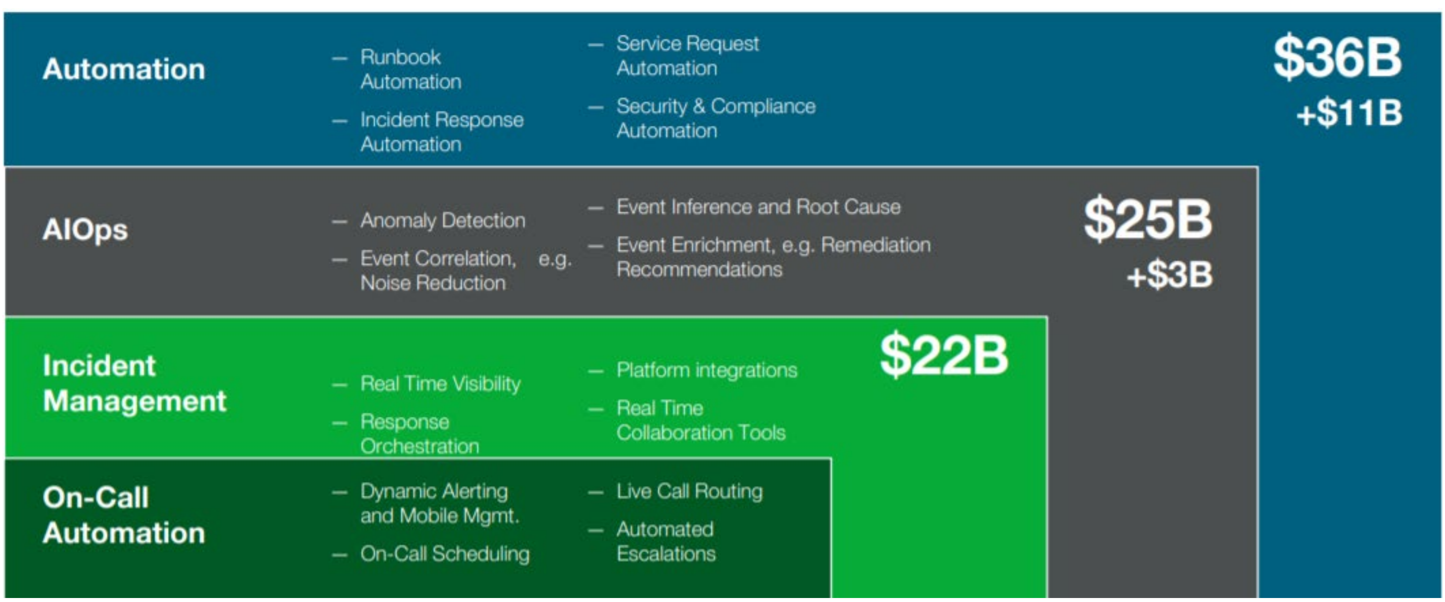
Software initiatives continue to dominate priority list, though category spend is not immune to the slowing macro environment. 3Q22 Survey data shows that CIOs expect software spending to decelerate from +3.7% in 2022 to +3.1% in 2023. Cloud Computing, Security Software and DW/BI/Analytics are the top three areas of focus for CIOs. CIOs indicated a modest uptick in vendors more willing to discount prices in 3Q22, although the discounting environment remains more subdued than peak levels seen during Covid.

Identifying companies with more resilient business models and market exposures will be the key to software investing in 2023. Characteristics we use to identify these companies include: 1) Underpenetrated market, 2) High IT spending priority, 3) Low ASP, 4) Quick time-to-value, 5) High customer retention, 6) High degree of incremental operating leverage/cost discipline and 7) FCF generative or clear profitability timeline.

A key challenge for software investors looking to assess demand impacts across the industry stems from an evolution in business / pricing models the group has undergone over the past decade: away from selling perpetual licenses and towards selling subscriptions (and more recently selling consumption credits). The challenge stems from material differences in revenue recognition across license revenue (upfront revenue recognition), subscription revenue (ratable revenue recognition) and consumption revenue (revenue recognized by usage). Because of this dynamic, demand downturns are readily visible and measurable in license models: when the demand environment deteriorates, it rapidly translates into fewer licenses sold and thus slower revenue growth. Not so, in subscription, where a healthy portion of revenue in any given period is sitting on the balance sheet as deferred revenue waiting to be amortized through the P&L as recognized revenue.

Industry Backdrop & Investment Considerations

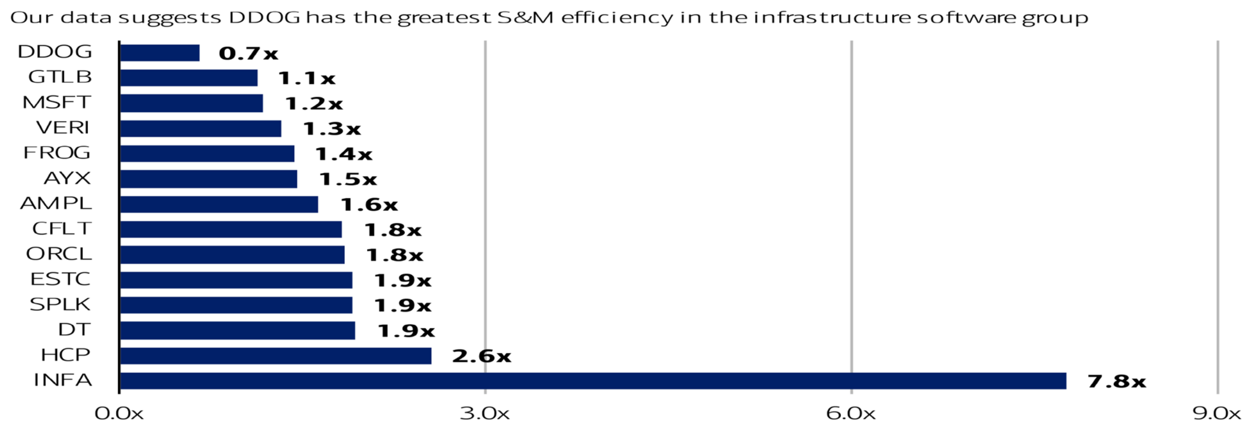
According to the Gartner Forecast, the managed services and cloud infrastructure services market worldwide is estimated to be $410 billion in 2020 and is expected to grow 7% annually to $502 billion in 2023.



The markets for edge computing, content delivery and streaming, cloud security, and application delivery controller were estimated to have a total market opportunity of approximately $26B in 2020. This total market opportunity will grow to $35.5B in 2022, representing an expected CAGR of 15.3%.

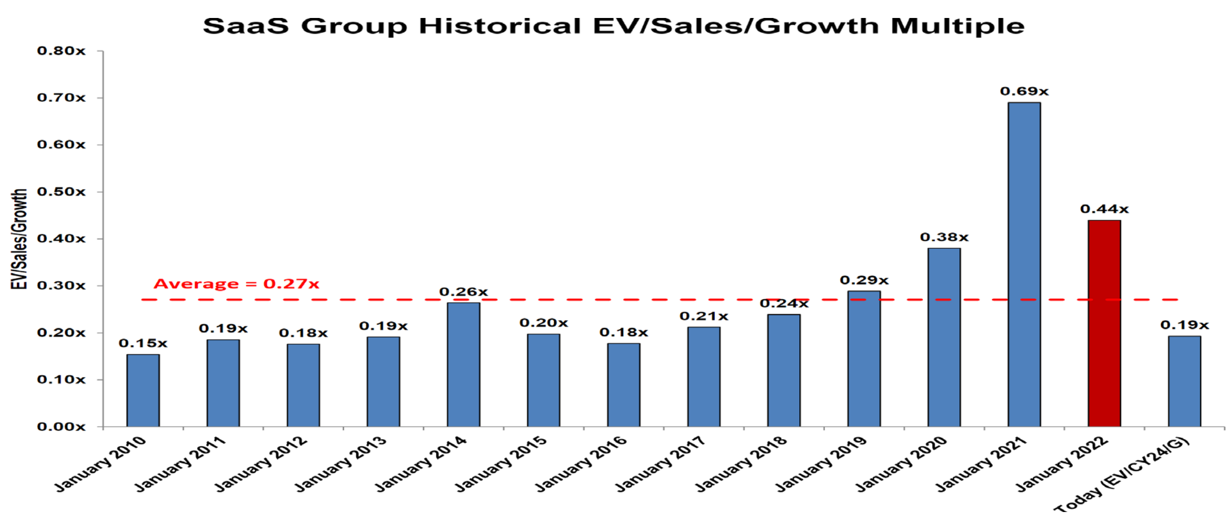
Indicators, Metrics & Stock Selection Framework

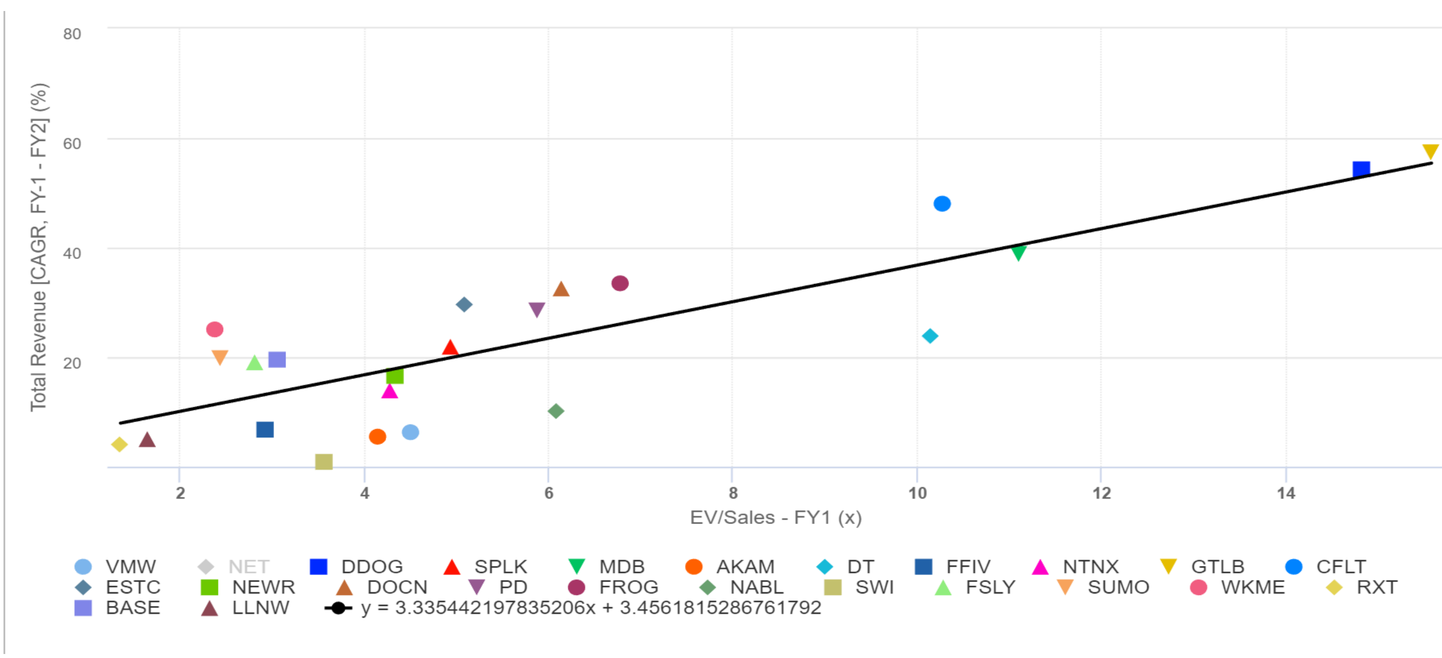
EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit



Valuation & Comps

EV/Sales to Revenue CAGR





Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Cloud Infrastructure						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
VMW	VMware, Inc.	53.0B	12.54X	4.50X	15.70X	6.37%	7.75%	30.49%	30.90%	-12.52%	-3.61%
DDOG	Datadog Inc	25.6B	74.08X	14.82X	77.02X	33.93%	34.11%	16.04%	24.35%	82.00%	8.23%
NET	Cloudflare Inc	32.1B	241.43X	32.70X	-422.05X	35.24%	52.87%	-1.07%	-6.56%	266.67%	4.80%
SPLK	Splunk Inc	15.0B	32.76X	4.93X	40.97X	16.32%	35.68%	-8.24%	4.04%	-187.08%	6.13%
MDB	Mongodb Inc	14.6B	289.11X	11.11X	400.21X	25.36%	72.40%	-2.83%	-0.12%	-176.92%	7.08%
AKAM	Akamai Technologie	14.0B	9.83X	4.15X	16.00X	4.49%	3.56%	31.60%	24.83%	-10.82%	-3.37%
DT	Dynatrace Inc	11.7B	38.13X	10.15X	36.33X	19.03%	16.54%	25.15%	25.09%	22.39%	21.60%
FFIV	F5 Inc	9.2B	8.63X	2.93X	12.08X	7.26%	12.23%	28.87%	15.17%	9.49%	7.06%
NTNX	Nutanix Inc	7.7B	50.07X	4.27X	80.67X	15.66%	125.62%	-5.43%	1.17%	-127.69%	9.22%
CFLT	Confluent Inc	6.8B	-32.90X	10.27X	-34.78X	32.28%	-14.36%	-41.41%	-29.39%	-16.34%	6.44%
ESTC	Elastic NV	5.7B	131.58X	5.09X	117.22X	23.75%	372.06%	0.10%	-0.20%	-97.50%	25.23%
GTLB	Gitlab Inc	7.4B	-71.71X	15.58X	-105.17X	40.82%	-7.41%	-38.90%	-21.12%	-58.84%	71.84%
NEWR	New Relic Inc	4.3B	51.53X	4.33X	105.38X	15.59%	371.40%	-6.25%	-1.89%	-125.68%	16.67%
DOCN	DigitalOcean Holdin	2.9B	18.07X	6.15X	71.92X	29.07%	37.16%	11.76%	5.60%	16.43%	1.34%
PD	Pagerduty Inc	2.3B	137.64X	5.88X	-2434.14X	22.93%	-920.66%	-8.19%	-4.56%	-95.00%	1.63%
FROG	JFrog Ltd	2.3B	125.40X	6.78X	118.64X	27.81%	617.82%	2.04%	11.16%	-200.00%	2.38%
NABL	N-Able Inc	2.0B	20.24X	6.09X	8.69X	9.54%	4.36%	28.47%	4.24%	-4.02%	-4.25%
SWI	SolarWinds Corp	1.5B	9.25X	3.57X	15.25X	3.28%	8.52%	40.18%	19.80%	-20.38%	-3.78%
FSLY	Fastly Inc	1.2B	-30.30X	2.81X	-14.76X	14.79%	-7.60%	-15.56%	-25.08%	17.82%	5.16%
SUMO	Sumo Logic Inc	1.1B	-20.81X	2.44X	-17.00X	16.78%	-3.02%	-19.91%	-13.60%	-46.27%	2.79%
WKME	Walkme Ltd	0.9B	-11.34X	2.39X	-10.78X	18.73%	-29.75%	-25.95%	-19.76%	8.59%	27.13%
RXT	Rackspace Technolc	0.7B	7.19X	1.35X	17.72X	-1.76%	-36.03%	16.09%	8.72%	-44.27%	3.60%
BASE	Couchbase Inc	0.6B	-10.72X	3.06X	-10.27X	16.49%	1.77%	-36.84%	-34.31%	-46.23%	23.68%

Management Commentary

DataDog (DDOG) on structural growth and unlocking value…. “So essentially, the -- first of all, I think I won't repeat all the numbers, but we have a very large TAM. It is driven by workloads being put into the cloud. We think there's a very, very long-term high growth rate. We won't give a number specifically in this activity that we're early stages in it and then applications, a significant minority of applications are being monitored in the cloud today. So that is sort of the underpinnings of the company's growth. We've always been growing at a higher rate than the hyperscalers. The hyperscalers have a broader business which is delivering applications that are more diversified. For instance, a number of the hyperscalers are delivering office products or types of things. And when we think about our growth rate relative to the hyperscalers, some of the reasons that we've been in excess of it are, one, we tend to focus on high-priority workloads, client facing, modern dev and complicated applications. And we believe the growth rate of that cloud workload has been higher than the weighted average of the cloud providers. We also have been -- we also have been expanding our product suite. So when you look at just the infrastructure portion of it, we've also added on a lot of elements to the platform. 5, 6 years ago, we didn't have the logs and APM much less some of the other products. So that's created a higher growth rate as clients have adopted more of the platform. And we've also been winning market share in the market from both other companies and most likely open source, although most of our business is greenfield workloads.”

Cloudflare (NET) on headwinds…. “I mean I think with the first time we talked about headwinds that would be building up was as early as the fourth quarter of last year already. And people just -- we had a little folks at that time gave us a little credit for that. But we see a lot. We see a lot of data and that influences business decisions. So what has certainly become a theme over the last 2 or 3 quarters is that new logo acquisitions have become significantly more difficult, that the more ACV is under negotiation, the longer it takes people measured twice before they sign. We've seen that. And we have not seen many changes to the better over the last 2 quarters to be very honest. Where we see hope, especially unique to us, is when it comes to Security and the threat landscape has not -- has become more relentless. The war in the Ukraine does its thing to heighten the threat landscape. So there are certain tailwinds that we are seeing. But overall, from a macro perspective, the themes that showed up in the second quarter continued in the third and have not changed materially in the fourth quarter."

Splunk (SPLK) on reducing opex…. "Turning to our operating expense reduction efforts. We're also making good progress in the 4 areas we've identified on last quarter's call. Contingent labor, travel and expenses, hiring and real estate. We began taking actions to reduce our total labor cost by utilizing contingent labor for only the most business-critical projects. Over time, we think there is substantial cost savings here. For T&E, we continue to limit spend on customer-facing travel and support only, and our customers and our employees have adjusted to an ongoing culture of expense reduction and efficiency. Our measured and deliberate approach to hiring has allowed us to drive efficiencies across our entire business while still expanding overall sales capacity. Beyond these 4 areas of focus, there are many other opportunities to streamline operations and increase profitability. This one example is a more expansive approach on transacting in multiple currencies globally. Historically, we've denominated all customer contracts in U.S. dollars and have relied on partners to absorb foreign exchange risk in exchange for a discount. As we continue to enhance our international execution capabilities by denominating contracts in local currencies, we can assume the FX risk, hedge it ourselves and capture higher gross value of the underlying contracts. Overall, through our discipline and prioritization, we're making significant progress on cost initiatives, which contributed to a $30 million sequential decrease in total OpEx in the quarter and a year-over-year decrease of 2%. We are pleased with our progress on expense control and remain confident we can continue to drive operating leverage from high-impact cost efficiencies going forward."

OptionsHawk Executive Summary & Focus Stocks

Datadog (DDOG) is the top operator among the large caps in this group and continues to post impressive growth while FCF positive though 77X EV/FCF is a steep price to pay. **Cloudflare (NET)** is growing rapidly as well but trades more than twice the EV/Sales multiple as DDOG and could be the short-side of a pairs trade to protect the potential of multiple compression in high valuation names. **MongoDB (MDB)** is another rapid growth that unlike DDOG is not generating the FCF at this stage. **F-5 (FFIV)** at 12X FCF while still generating solid growth and FCF with upward revisions looks attractive. **Nutanix (NTNX)** appears to be a likely acquisition target in 2023. In the $3B to $6B market cap tier we are again looking at rapid topline growth but a lack of profitability. **Digital Ocean (DOCN)** is completely out of favor and despite comparable growth is trading just 18X EBITDA and already has positive FCF margins with upward revisions, a name that could offer nice returns going forward. **Confluent (CFLT)** screens as the best short in that group with it far from profitability and seeing weaker growth. **Gitlab (GTLB)** has been a stellar beat and raise story but trades 15.5X EV/Sales which makes it a risky own. Of the names with market caps below $2.5B there are some real weak outlook names like NABL, SWI, RXT, SWI and FSLY. **JFrog (FROG)** stands out as a favorite among these names and also screens as a potential M&A target.

Software – CRM & Marketing

Components: TTD, HUBS, ZI, NICE, DOX, XM, APP, DV, FRSH, CVT, BRZE, VRNT, CXM, CSGS, SSTK, AMPL, SEMR, INTA, APPS, IAS, MNTV, USER, PERI, PUBM, MGNI, YEXT, THRY, TRMR, SMWB, IBEX, WEAV, DSP, BCOV, EGAN, VERI, OB

International & Private Peers

Intro

In the new software environment as discussed in the previous sections companies can benefit from opex productivity gains as markets currently favor shorter duration equity stories over multiyear free cash flow promises. Multiple expansion in this environment is contingent upon progress towards profitability and incremental FCF generation. With slowing global growth and tightening budgets on the horizon, margin expansion is the path of least resistance for generating incremental free cash flow. Software companies have previously demonstrated an ability to expand operating margins during periods of deceleration. Cost-discipline will be a key theme for stock-picking in this group.

Customers in more regulated industries such as healthcare, financial services and government are sources of relative strength, vs. weakness at those in the technology vertical. Transportation, industrial and manufacturing customers in aggregate are steady.

Stock-Based Compensation (SBC) has been another hot topic in Tech representing a true cost to shareholders despite being non-cash. Software companies have rapidly increased headcount over the past several years to fuel growth, with heightened competition for top talent making this a particularly expensive endeavor. SBC dilution is surging as more awards are granted to offset falling equity prices. GAAP requires stock-based plans to be recognized as an expense over the period in which the services are performed. Investors may under-appreciate potential dilution as many new public equity entrants are currently unprofitable and/or adjust earnings measures by adding back SBC costs. Prominent market data vendors also often exclude dilutive SBC shares from market capitalization estimates.

Company	Ticker	Sector	Market Cap (USD in billions)	Grant y/y % Δ	Value y/y % Δ	SBC Exp y/y % Δ
SentinelOne, Inc.	S	Info Tech	6,082	2054%	2145%	109%
Doximity, Inc.	DOCS	Health Care	4,924	1814%	2364%	142%
Roku, Inc	ROKU	Comm Svcs	7,048	1430%	478%	88%
Signify Health, Inc.	SGFY	Health Care	5,198	1343%	NA	274%
Oak Street Health, Inc.	OSH	Health Care	4,500	1233%	291%	7%
Zoom Video Communications	ZM	Info Tech	22,008	1102%	284%	131%
Teladoc Health, Inc.	TDOC	Health Care	3,920	938%	169%	-34%
Guardant Health, Inc.	GH	Health Care	4,477	626%	84%	-44%
Coupa Software Inc	COUP	Info Tech	3,976	487%	135%	14%
Paylocity Holding Corp	PCTY	Info Tech	12,267	462%	906%	53%
Docusign, Inc.	DOCU	Info Tech	9,346	412%	82%	39%
Block, Inc.	SQ	Info Tech	31,835	390%	105%	101%
Pinterest, Inc.	PINS	Comm Svcs	15,517	369%	46%	6%
Zillow Group, Inc.	Z	Real Estate	6,926	365%	67%	27%
Etsy Inc	ETSY	Cons Disc	11,943	353%	152%	138%
DoorDash, Inc.	DASH	Cons Disc	17,675	264%	102%	53%
Natera, Inc.	NTRA	Health Care	4,028	247%	46%	30%
Veeva Systems Inc	VEEV	Health Care	24,255	244%	154%	47%
Sunrun Inc.	RUN	Industrials	4,327	243%	84%	-46%
Spotify Technology S.A	SPOT	Comm Svcs	16,786	223%	124%	31%
Confluent, Inc.	CFLT	Info Tech	6,609	211%	275%	164%
R1 RCM Inc. /DE	RCM	Health Care	7,272	203%	135%	-41%
Uber Technologies, Inc	UBER	Industrials	54,507	193%	62%	50%
UiPath, Inc.	PATH	Info Tech	6,452	182%	-15%	-45%
Snap Inc	SNAP	Comm Svcs	17,908	180%	18%	20%

Industry Backdrop & Investment Considerations

Digital Commerce provides a consistent and personalized experience across a growing number of channels by enabling customers to purchase through an interactive and self-service experience. Digital commerce products typically include product catalog navigation, shopping cart, check-out, customer account, and supply chain integrations.

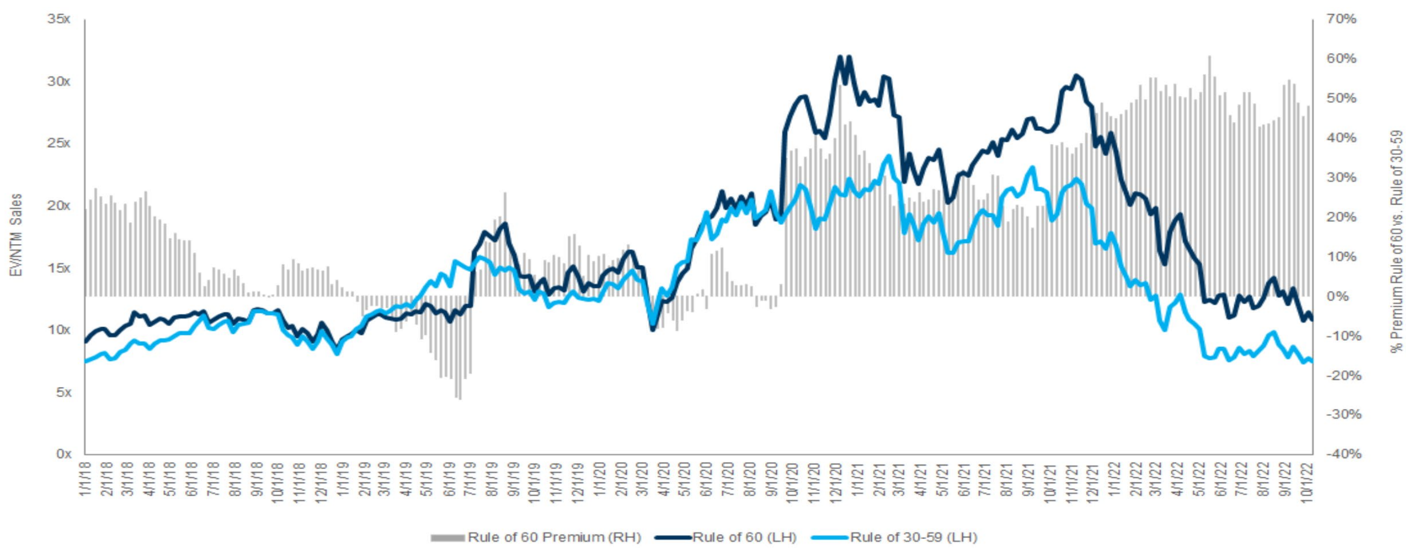
Consumer spending in apps market has a long runway remaining with app install advertising seen growing at a 21% CAGR reaching $130B in 2024.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR



Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
CRM & Marketing						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
TTD	Trade Desk Inc	24.9B	36.25X	14.96X	51.44X	20.05%	10.31%	38.63%	26.62%	9.47%	-0.19%
HUBS	HubSpot Inc	15.2B	67.86X	8.44X	84.27X	20.74%	13.42%	9.04%	13.60%	4.62%	-1.13%
NICE	Nice Ltd (ADR)	13.1B	17.55X	5.66X	27.36X	11.30%	15.47%	28.31%	20.54%	15.74%	14.44%
ZI	ZoomInfo Technolo	12.7B	27.68X	12.27X	38.76X	22.35%	24.16%	41.03%	36.91%	61.54%	8.02%
DOX	Amdocs Limited	10.8B	10.12X	2.20X	16.72X	6.71%	7.11%	17.59%	11.57%	1.53%	1.17%
XM	Qualtrics Internatio	6.3B	-157.89X	3.86X	-948.50X	17.04%	75.33%	2.97%	-9.39%	-500.00%	3.25%
FRSH	Freshworks Inc	4.5B	-202.36X	6.78X	-233.81X	21.29%	-30.91%	-4.92%	0.63%	-45.71%	0.94%
DV	DoubleVerify Holdir	4.1B	28.09X	8.62X	89.90X	23.81%	39.26%	8.02%	22.04%	20.93%	4.20%
APP	Applovin Corp	3.9B	5.85X	2.20X	6.59X	1.04%	905.52%	5.37%	12.76%	-145.61%	-24.20%
BRZE	Braze Inc	2.8B	-34.00X	6.52X	-39.32X	27.13%	-13.58%	-13.04%	-16.71%	-6.55%	2.64%
CVT	Cvent Holding Corp	2.8B	25.87X	4.48X	30.65X	17.59%	31.95%	19.98%	14.75%	26.00%	1.03%
VRNT	Verint Systems Inc.	2.4B	12.64X	3.35X	27.76X	5.09%	11.24%	23.70%	11.56%	0.00%	-4.27%
CXM	Sprinklr Inc	2.3B	174.80X	2.89X	-90.78X	15.26%	993.92%	-7.21%	-9.21%	-86.67%	26.40%
SSTK	Shutterstock Inc	1.8B	8.30X	2.20X	17.14X	1.98%	6.84%	20.38%	20.25%	1.88%	-3.58%
CSGS	CSG Systems Intern	1.8B	9.17X	2.05X	70.46X	6.69%	7.55%	15.45%	10.86%	10.84%	5.19%
APPS	Digital Turbine Inc	1.6B	9.94X	2.78X	12.03X	9.37%	2.05%	24.91%	8.22%	-16.17%	-41.21%
INTA	Intapp Inc	1.6B	332.01X	4.55X	83.23X	15.52%	617.24%	-2.62%	3.47%	-83.61%	28.46%
AMPL	Amplitude Inc	1.5B	-50.84X	5.07X		27.57%	2.31%	-8.75%	-19.87%	-48.84%	1.94%
MGNI	Magnite Inc	1.5B	11.13X	3.81X	17.47X	9.23%	37.73%	-0.69%	20.81%	-12.20%	-3.76%
IAS	Integral Ad Science	1.4B	13.05X	3.98X	19.12X	14.37%	165.66%	-10.20%	15.44%	-50.00%	-4.29%
SEMR	SEMrush Holdings I	1.2B	-50.49X	3.79X	-67.69X	22.34%	-13.70%	0.13%	10.63%	22.58%	2.85%
MNTV	Momentive Global I	1.2B	21.00X	2.42X	-130.66X	8.28%	89.52%	2.02%	10.95%	86.67%	-3.50%
PERI	Perion Network Ltd	1.2B	6.25X	1.21X	6.94X	15.25%	12.01%	9.59%	14.73%	87.96%	35.78%
USER	UserTesting Inc	1.1B	-24.71X	4.77X	-17.65X	19.65%	-5.60%	-27.35%	-29.77%	-76.75%	33.13%

Management Commentary

Trade Desk (TTD) on winning market share…. “We continue to gain share as advertisers embrace the precision and relevance of data-driven advertising on the open Internet via our platform. Throughout 2022 and in particular, in Q3, The Trade Desk has significantly outperformed seemingly all other forms of digital with a significant contrast to walled garden in our ability to win advertising budgets. It is very clear that under the current operating conditions, we are significantly outpacing the market regardless of the macro environment. Our vision and business strategy continues to be validated by our advertising clients. Nearly every single major advertiser wants a world where the open Internet thrives, where competition and price discovery thrive. They want great measurement that works across the web so that they can compare the performance of each site, app or destination to all the others. They want an Internet where relative value can be found. As we've predicted, CTV is a catalyst for massive change on the Internet. When possible, the power balance is shifting to the open Internet away from opaque walled gardens and systems that aren't comparable to others. With this context, hopefully, you can see why we continue to outperform the industry and gain share, and why we are confident that our future growth outpaces the projections of almost everyone else in our industry. Just one more data point on the market overall and how we are performing, WPP's GroupM predicted worldwide advertising will increase 8.4% in 2022, and we are growing at more than 3x that rate. CTV continues to be a key growth driver, and our shopper marketing initiatives are yielding very encouraging results. While still early, it's only our third full quarter, total shopper marketing spend increased nearly 3x from Q2 to Q3. So first, in terms of the macro environment, increasingly, advertisers view programmatic as one of the most effective ways to drive relevance and differentiation, especially in times of market volatility. And perhaps even more importantly, they believe that the open Internet is the best place to create that value compared to the limitations of the walled gardens.”

Zoom Info (ZI) on sales cycles and methods…. “The interesting thing, which might be a little different from what people see in other software companies, is that our historical go-to-market motion, both on the new sales and the account management side, has been really efficient historically. And I think you see that in the numbers and comes through in the profitability. When that happens and when we get a kind of market increase in the scrutiny that we're getting on deals, there's not a lot of slack within our team to spend extra time running an extra report or preparing for a meeting with procurement that didn't happen before those sort of things. And I think that lack of slack is actually causing our efficiency on the account management side to deteriorate more than maybe you might see elsewhere. And where we really see it is we're kind of getting to the same outcome with respect to renewals and downsells and so forth. But our team has materially less time to go out to other pockets in the organization and drive those seat and data upsells that we've experienced in the past. And even over the last couple of years, we've seen greater growth from other industries outside of software, high tech, largely because those were the early adopters of digitization around their go-to-market motions.”

OptionsHawk Executive Summary & Focus Stocks

This group features 36 stocks but only five with market caps above $10B and as you get to the smaller names there is a lot of junk. **Trade Desk (TTD)** still trades 15X EV/Sales and 51X FCF while I see structural headwinds continuing despite the uber bullish management, so I continue to favor shorting it. **HubSpot (HUBS)** has risks to its exposure to small business and although a name I have liked, not the right time for it. **Nice (NICE)** remains the favorite at 17.5X EBITDA and 27X FCF with 20% FCF margins, steady and solid. In the $4B to $6B tier **Double Verify (DV)** is a name I like trading 28X EBITDA and offering real strong growth with 22% FCF margins, also making it a potential M&A target. **Cvent (CVT)** is another small name that stands out with strong metrics and trading cheap to peers while having M&A potential. The twenty names with sub $1.5B market caps offer very little to like in a weaker spend environment but **Ibex (IBEX)** is a name I am coming across for the first time and looks quite attractive at under 20X FCF. **Intapp (INTA)** the other attractive name seeing strong revenue revisions higher while trading with positive FCF at 4.55X EV/Sales, a play in financial services.

Software – Back Office & HCM

Components: WDAY, PAYC, PCTY, BILL, CDAY, PYCR, ALIT, WK, BL, COUP, ESMT, VERX, EVCM, AVDX, BTRS, ZUO, EXFY, LAW

International & Private Peers

Intro

Software is a secular growth industry, based on the transformative impact of cloud computing and subscription models, the cost and efficiency savings associated with digital automation, and the power of extracting business insights from data aggregation with analytics tools. However, it is not immune to a slowing Macro and showing some cyclical qualities. Verticals like life sciences, insurance, and education are counter-cyclical and more defensive during downturns.

Intuit / QuickBooks entering the accounts payable (AP) automation market is a concern investors have with BILL. SMB exposure is typically seen as a risk during a downturn. In a world where extended sales cycles are becoming more of a norm for businesses with enterprise end-markets, businesses with self-service and light-touch sales motions have been more resilient. WDAY management recently continued to point to longer sales cycles and increased scrutiny in deal processes. Workday is also seeing sales cycle impacts in the US as business leaders push pause or introduce more caution in spending as companies wait and see how the macro climate develops.

Industry Backdrop & Investment Considerations

The Back-Office Applications software category includes software for Human Capital Management, Finance/ERP, Travel and Expense, Procurement/Supply Chain Management, B2B Payments, and ITSM/ITOM. These have a TAM of $400B and are seen growing at a 5-year CAGR of 6.3%.

The market opportunity in the U.S. for payroll and HCM applications and services is driven by the importance of payroll and HCM solutions to the successful management of organizations. PCTY estimates the market opportunity for medium-sized businesses at $18B. According to an IDC report the global market for Human Capital Management and Payroll Applications is $25B, of which $16B is for HCM applications. According to IDC, the HCM and payroll application market is expected to grow to $30.5 billion by 2022, representing a 9.6% CAGR, and includes payroll, HR, talent acquisition, workforce management, document management, performance management, compensation management, and succession planning.

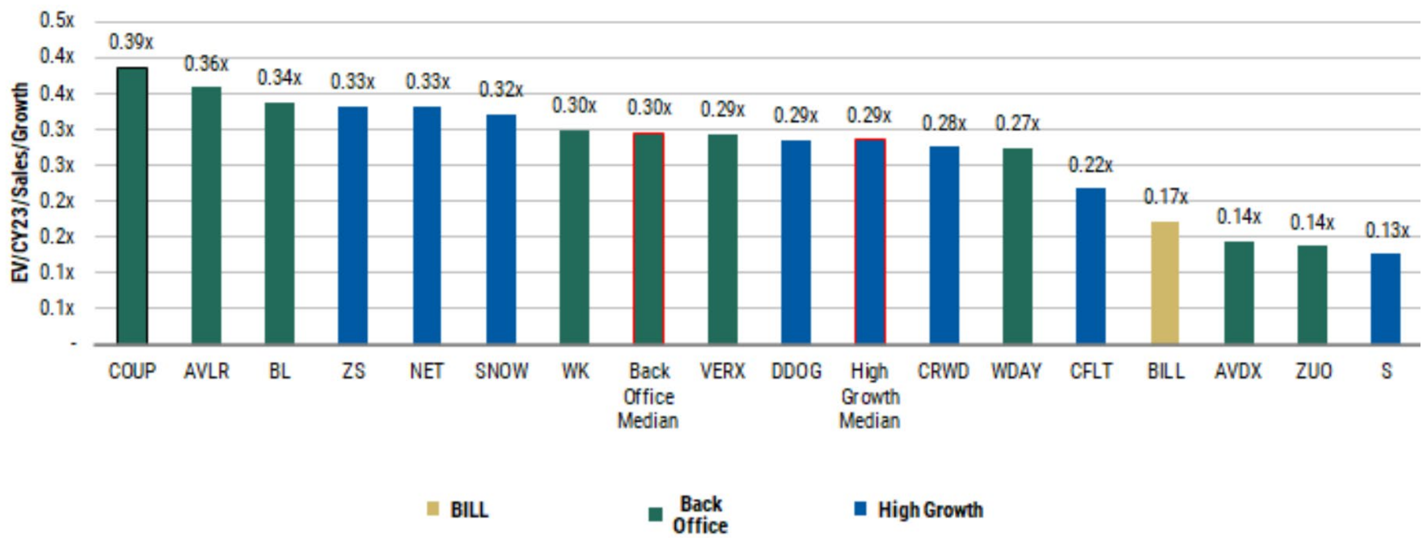
Managing spending efficiently has become a priority for organizations as they try to remain competitive, while also maintaining lean cost structures. The market for business spend management is substantial – Coupa estimates this is $56B (ex-payments and treasury capabilities) vs. $12B today and growing 10%/year.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR



Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Back Office & HCM						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
WDAY	Workday Inc	46.1B	28.27X	7.0231	34.2623	17.18%	28.38%	22.37%	23.49%	-2.75%	0.09%
PAYC	Paycom Software Inc	19.0B	33.43X	13.6134	7.9885	23.00%	25.91%	33.26%	18.30%	8.66%	4.31%
BILL	Bill.com Holdings Inc	13.1B	172.83X	12.2125	844.3889	30.60%	106.69%	-2.28%	-5.25%	-223.60%	67.05%
PCTY	Paylocity Holding Corp	11.7B	34.37X	10.3281	80.2773	22.16%	27.79%	23.06%	12.02%	53.01%	35.13%
CDAY	Ceridian HCM Holding Inc	10.6B	48.52X	9.2575	272.8263	17.23%	25.48%	8.47%	-1.45%	80.81%	2.51%
COUP	Coupa Software Inc	6.0B	34.91X	8.6687	50.0217	17.61%	67.47%	12.32%	21.27%	147.06%	0.36%
PYCR	Paycor HCM Inc	4.7B	32.65X	8.7233	-3.6665	17.64%	30.92%	11.06%	-4.22%	81.25%	28.40%
WK	Workiva Inc	4.4B	-266.80X	8.1256	718.0229	16.47%	-97.54%	4.51%	10.40%	-41.03%	0.10%
BL	Blackline Inc	4.2B	90.59X	8.8173	345.6237	16.98%	54.36%	8.59%	13.35%	-25.41%	23.24%
ALIT	Alight Inc	5.0B	12.74X	2.6845		8.60%	145.36%	18.97%	0.03%	23.08%	0.04%
ESMT	EngageSmart Inc	2.8B	53.93X	8.4383	73.4123	26.12%	21.79%	12.95%	9.20%	126.50%	41.53%
VERX	Vertex Inc	2.4B	31.03X	4.8125	141.796	12.29%	18.73%	15.58%	11.03%	-1.69%	1.06%
AVDX	AvidXchange Holdings Inc	1.9B	-84.03X	4.9376	-25.2854	19.41%	3.25%	-24.87%	-40.68%	-63.46%	5.14%
BTRS	Btrs Holdings Inc	1.6B	-98.94X	8.6227		22.23%	-45.35%	-29.46%	-6.73%	10.81%	29.26%
EVCM	EverCommerce Inc	1.3B	14.80X	2.8043	33.6567	12.40%	22.17%	0.60%	4.63%	7.81%	-0.81%
ZUO	Zuora Inc	0.9B	49.77X	1.7085	-41.9314	9.89%	6546.67%	-2.34%	2.47%	275.00%	-2.40%
EXFY	Expensify Inc	0.8B	17.66X	4.3343	28.9644	14.36%	17.63%	26.72%	-1.49%	-11.18%	-3.69%
LAW	CS Disco Inc	0.4B	-4.24X	1.5917	-3.7845	16.93%	-1.49%	-15.94%	-21.64%	17.72%	-10.26%

Management Commentary

Workday (WDAY) Investor Day on growth opportunities…"So I want to touch base on a few of the growth opportunities as we may -- we move to the new next phase, which is to be coming, as you know, a $10 billion company and basically ensuring that through that journey, we keep a 20% plus subscription revenue growth. So a few other areas of focus you're going to hear on today and potentially these are more ones that we have commented less or least on the past, right? We have a massive opportunity to deliver value through our winning partnerships. And if you've been through at the conference, you've been hearing about industry-driven partnerships, and you've been hearing about the industry accelerators. And those we are building them with our SIs. And again, that's a great opportunity of growth going forward that some we touch base on. I wanted to, first of all, just talk about our opportunity. And our opportunity for truly long-term growth, I believe, is pretty incredible. Our opportunity has, in fact, increased about 20% in the last year to $125 billion. So of that, approximately $20 billion of expansion, let me drill into that just a little bit, the majority actually is coming out of the human capital management market which might be a bit of a surprise. But there's so much more opportunity in the broader recruiting market and we're expanding our road map even further. With the addition of new products like Candidate Engagement and Messaging, we're providing a powerful way to personalize recruitment marketing activities and really open up the communication channels between recruiters and candidates. We've been highlighting internationals have become a very critical growth driver to what we do, and we're having very solid momentum in international."

Paycom (PAYC) on the success, differentiation and potential for BETI…. "Sure. And so you start with the premise that no one in the back office is reading an employee's mind. Somehow, that data has to get transferred from the employee to the back office. And so you start with that and actually having the employees interact with their data and actually make their own data changes and confirmations. Once you have employees doing that, you can actually automate things further such as payroll. And so we already had employees clocking in, clocking out, requesting time off, enrolling in benefits, applying for the job, doing their learning management. You have all that data in the system. Putting it together so that employees can also do their own payroll because in most cases, employees are the only ones that know whether or not their payroll is correct or not, at least the top line data, the earnings piece. And so by leveraging the employees and you have a person that's willing and interested in making sure that their check is correct, by leveraging their desire to make sure it's correct, you're able to eliminate and reduce certain exposures and liabilities that exist for an employer by paying somebody incorrectly. You've got 65%, call it, of the American worker that lives check to check. That's not just your hourly worker. You never know. You even have salaried employees that it's very important that they get paid the exact amount. And so what we found is that because employees are the ones impacted when they're not paid correctly, they're more than willing to correct everything and make sure it's accurate before a business incurs the exposure risks and costs associated with correcting. So we've just moved more into the employee experience. It's got to be very simple for employees and you've got to have a system that does it all. And that's what we've created over, like you say, 25 years."

Bill.com (BILL) on market opportunities…. "So at Bill, we have a platform for small businesses to automate their financial back office, so things like accounts payable, accounts receivable, kind of the messy, legacy paper-based processes that most small businesses use today. And we created the platform from the ground up for small businesses. What that means is it's easy to use, it's self service, it's low cost. It's built specifically for them versus, say, an enterprise solution that's been stripped down to try to work for small businesses. We recently added some other capabilities around spend management and corporate cards as well as advanced AR capabilities. So the market that we're going after is huge. In the U.S. alone, there are 6 million businesses with employees, 30 million overall, if you count, sole proprietors and companies like that. So it's a massive market opportunity. And one of the key things that differentiates our company versus others in addition to the platform is just the scale that we have and our go-to-market ecosystem, which where small businesses are pretty hard to serve economically, and so part of our strategy has been to reach them wherever they are. So direct on the web through accounting software, through financial institutions and even accounting firms that support their clients. And that's allowed us to gain a lot of traction. We have 400,000 customers. We're approaching $1 billion in revenue, $250 billion or so in payment volume. So we're starting to scale."

OptionsHawk Executive Summary & Focus Stocks

Workday (WDAY) is the largest name in this group and one of the best in all of software with attractive valuation, strong growth and great unit economics. PAYC, BILL, PCTY have all proven to be quality beat and raise stories and all come at pricey valuations and just a tough spot to be confident buying any of those.

Blackline (BL) is a name in the next tier I would highlight as a likely M&A target with niche names attractive to larger Software players and it trades 8.8X EV/Sales. **EngageSmart (ESMT)** screens best of the smaller names at 8.4X EV/Sales and with 13% FCF margins with rising estimates. **Vertex (VERX)** is another potential M&A play as a provider of tax solution software and trading 4.8X EV/Sales with strong growth, positive FCF and stable estimates.

Software – Commerce & Web Development

Components: SHOP, VRSN, GDDY, TOST, NVEI, WIX, GLBE, ZD, STNE, LSPD, SQSP, IS, OLO, PRO, VNET, VTEX, RSKD, BIGC, PAR, ECOM, TUYA, TCX, CTLP, GCT

International & Private Peers

Intro

Secular growth in ecommerce is returning to its trend which was an overhang in 2022 but companies like SHOP continue to utilize company-specific drivers with partnerships and new offerings. US ecommerce sales growth is correlated with discretionary cash flow growth**.** LSPD's Capital Markets Day highlighted its large Payments opportunity and the company's focus on efficiency. With macro headwinds and a more focused approach to customer additions limiting location growth, an inflection in payments & profitability is likely needed for a re-rating. GLBE is cutting down key hurdles to cross-border e-commerce (particularly related to localizing merchant content, managing payments, and facilitating fulfillment) while building scale and leverage around its capabilities. TOST is showing an ability to sustain market share gain momentum, while simultaneously driving higher ARPU through attach of more software products and expanding FinTech solutions, increasing GPV take rates.

Historically, business formations have slowed ahead of recessions, which would be a headwind to the Web Development group. Business applications remain stable to this point but are worth monitoring. WIX/SQSP have shown an ability to generate FCF and expand margins and WIX is a current Starboard activist position. The longer-term secular growth trend of higher online business penetration is a positive for this group. For GDDY, accelerating product innovation supports the ability to increase LTV with greater attach of websites & commerce to core domains. GDDY is focused on accelerating the adoption of its payments product in 2023.

Industry Backdrop & Investment Considerations

IDC estimates that the global market for digital commerce applications was $4.7B in 2019 and is expected to grow at a compound annual growth rate of 11% to reach $7.8B in 2024. Shopify estimates its small business TAM at $78B. GoDaddy breaks down the opportunity into Dream, Create, Grow and Manage stages for the lifecycle of entrepreneurs with online businesses amounting to a $350B total TAM. Global spending on the eCommerce software application market is expected to grow from $6.3bn in 2020 to $7.3bn in 2024, according to Statista.

Web-Design tools is seen as a $150B market inside this group. There are over 800 million small businesses and self-employed ventures globally according to Intuit and 540K new businesses are created each month in the US according to the Kauffman Index. According to IBIS world, the web design services market is estimated to be $40.8bn in the US in 2021, with still a high degree of fragmentation due to the preponderance of professional web designers and developers.

Global-e (GLBE) is one of the leading pure plays in the nascent, rapidly growing cross-border subsector of eCommerce. Forrester estimates that the overall cross-border B2C eCommerce market will increase to $736bn in 2023, while Accenture Research estimates cross-border growth is 2x the rate of domestic growth in eCommerce.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Commerce and Web Developr						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SHOP	Shopify Inc (US)	46.7B	-724.64X	7.74X	-82.46X	20.98%	-68.81%	15.57%	9.84%	-119.48%	-9.06%
VRSN	Verisign, Inc.	21.3B	22.53X	15.53X	28.72X	8.75%	11.70%	65.29%	56.80%	13.16%	7.08%
GDDY	Godaddy Inc	11.5B	14.29X	3.55X	13.74X	6.24%	17.48%	10.01%	15.10%	0.91%	-1.45%
TOST	Toast Inc	10.3B	-77.91X	3.40X	-58.44X	32.58%	-69.80%	-3.75%	-1.00%	-48.94%	14.05%
WIX	Wix.Com Ltd	4.9B	-99.08X	3.13X	-840.05X	8.78%	-154.53%	-7.00%	2.20%	-44.98%	8.94%
ZD	Ziff Davis Inc	4.0B	8.48X	3.10X	0.34X	3.08%	7.53%	35.20%	28.43%	-22.32%	-16.91%
NVEI	Nuvei Corp	3.8B	10.18X	4.29X	13.76X	17.54%	92.62%	42.15%	33.08%	-11.94%	-12.88%
GLBE	Global-E Online Ltd	3.5B	75.07X	8.20X		39.90%	-14.57%	7.60%	5.25%	#######	69.79%
STNE	StoneCo Ltd	3.0B	3.84X	1.77X		21.54%	38.98%	16.47%	37.65%	165.68%	104.07%
SQSP	Squarespace Inc	2.8B	23.34X	3.63X	20.96X	10.57%	65.08%	8.55%	14.30%	-114.00%	-1.18%
LSPD	Lightspeed Commerce Inc	2.6B	-43.75X	2.37X	-29.47X	26.77%	94.74%	-12.93%	-17.85%	-28.57%	35.39%
OLO	Olo Inc	1.1B	47.47X	3.56X	66.70X	16.66%	30.37%	14.24%	9.65%	-45.45%	-5.46%
PRO	PROS Holdings, Inc.	1.1B	-46.12X	4.23X	-54.43X	10.04%	-14.39%	-13.07%	-8.49%	-18.52%	2.18%
TUYA	Tuya Inc (ADR)	1.0B	-0.60X	0.44X		0.77%	-34.47%	-38.89%	-43.80%	-25.58%	-30.99%
RSKD	Riskified Ltd	0.9B	-8.26X	1.45X		18.20%	27.32%	-8.56%	-14.74%	-82.22%	14.21%
VNET	VNET Group Inc - ADR	0.8B	7.30X	1.88X	-4.38X	13.70%	54.32%	0.34%	-23.23%	-138.14%	16.97%
VTEX	VTEX	0.7B	-11.00X	3.24X	-13.49X	26.68%	-70.98%	-34.27%	-43.52%	22.45%	-0.54%
BIGC	Bigcommerce Holdings Inc	0.7B	-14.98X	2.56X	-7.39X	16.12%	-18.03%	-10.38%	-19.83%	2.45%	0.72%
PAR	PAR Technology Corporati	0.6B	-39.03X	2.59X		8.62%	-39.72%	-8.98%	-21.72%	6.01%	8.46%
TCX	Tucows Inc. (USA)	0.3B	9.19X	1.67X		3.53%	#VALUE!	2.19%	-14.31%	0.00%	0.00%
CTLP	Cantaloupe Inc	0.3B	20.86X	1.10X		13.99%	#VALUE!	-1.29%	-8.75%	-42.86%	13.59%
GCT	GigaCloud Technology Inc	0.3B	5.88X	0.29X		9.31%	128.00%	11.84%	1.63%	0.13%	487.97%

Management Commentary

Shopify (SHOP) on its value offering in this environment…. “Shopify's essential tools serve as a business' central operating system. These tools help our merchants stay ahead of the curve as commerce continues to rapidly evolve. This is particularly important today as businesses grapple with the consequences of rising interest rates and inflation. This is a key reason why merchants choose Shopify: We make the important things easy and everything else possible. Today, brands have to be more sophisticated in how they reach and sell to consumers as shopping continues to evolve. It has become critical for merchants to be discoverable across multiple platforms and services, showing up directly where their consumers are shopping. While still very nascent, GMV through native checkout integrations on key partner services such as Facebook, Instagram and Google, more than tripled from Q3 last year. Another way that Shopify is enabling merchants to build buyer relationships is through Shopify Audiences, our new tool that helps Plus merchants find high-intent customers. Another marketing tool that we launched in early access in mid-August is Shopify Collabs, which brings brands and creators together. We're also investing in our merchants' ability to grow by helping them go global. Shopify Markets, which launched in Q1 allows merchants to identify, set up, launch, optimize and manage their international markets from a single storefront. We also continue to improve the back office experience.

Earlier this year, we launched Shopify Tax, a new product that takes the stress out of sales tax for our merchants so they can focus on what matters most to them: Their products and their customers."

Go-Daddy (GDDY) on its more diversified business growth…. " But even in a difficult environment, looking at our thesis play itself out in 2022, I think, is something we're extraordinarily proud of. We're in an environment that we have to continue to balance our decisions today while looking at the long term with an eye on the future at all times. We outlined what we thought our long-term opportunity was on an Investor Day, and that remains totally unchanged. We believe in our strategy. We believe in the one-stop shop around the entrepreneur and the small business. We believe in our model. We generate a lot of free cash flow. What we have out there on the innovative side that is not included in that right now is something we've been talking about recently in beta, which is called Payable Domains. And think about it. It's the concept of any time you get a domain name, it will automatically be enabled to take payment. So as soon as you secure a domain name, you can take payment on that domain name. You have a couple of steps you have to take, but almost frictionless right when you're getting the domain name. And if you look at our ability to grow with our customers over LTV, if you make that selection of adding payments right on the first choice, right when you're deciding that domain name, you now have an attach immediately. And once our customers start attaching, it comes to the why would they go anywhere else to get that service. Our pricing on it is extraordinarily competitive. But let's take it out of the whole, hey, we have the one-stop shop, we're attaching, but think about it from innovation around domains in and of itself. We will be the only company in the world that offers a differentiated domain."

OptionsHawk Executive Summary & Focus Stocks

Shopify (SHOP) continues to grow and scale but valuation was a reason we were cautious into last year and saw a short opportunity and lack of profitability remains an issue. **Verisign (VRSN)** is a quality business that generates a ton of FCF and seeing estimates revies higher, so a top name at 29X FCF. **GoDaddy (GDDY)** fits into the value buy group as a name that has gone nowhere for years but at 14X EBITDA and 13.7X FCF with solid growth, albeit at lower margins, looks attractive. **Wix (WIX)** is a name I see as an eventual acquisition target with an activist involved. **SquareSpace (SQSP)** is the only name that screens attractive in the small caps at 23X EBITDA and 20X FCF with solid growth and 14% FCF margins. A lot of the smaller names here screen as shorts.

Software – Financial Applications

Components: INTU, SSNC, BKI, CCCS, GWRE, CWAN, NCNO, ENV, QTWO, ENFN, DCT, MLNK, ALKT, SPNS, PGY, EBIX, BLND, OSPN, FRGE, APPF, TYL

International & Private Peers: Xero, Temenos

Intro

The same environment for software carries through to all these verticals and it is no different with financial applications. Much like the groups discussed above it will be important to show durable growth with profitability and the financial industry should hold up better than many others in a downturn while many of these companies remain in the early stages of penetration.

RBC laid out its ten key themes for Software in 2023 which was a good summary:

With Q3 earnings season in the rear-view mirror, investors are still questioning what next year looks like and with only a handful of companies guiding to next year, 2023 is largely an unknown. We would note consensus 2023 revenue growth estimates have already come down 4% relative to the beginning of the year (based on the median 2023 revenue growth rate in the RBC Software Index) and investors increasingly expect 2023 guidance to come in light of expectations, owing to macro challenges. The wrinkle is that companies still broadly sound optimistic, in our view, and we may see multiple cuts to 2023 numbers, not just one. Finally, we would add that if 1H23 is the trough of bookings, then 2024 numbers (to the extent investors are willing to underwrite 2024) may also need to come down, given the lag from bookings to billings to revenue. That said, as economic conditions and thus bookings start to improve, some companies could be in a position to ultimately accelerate revenue growth.

Business models matter. After publishing our software business models primer (see here), we continue to believe a deep understanding of varying business models in software is critical, especially when assessing recession sensitivity. We believe consumption models will be the most sensitive to recessions (but also recover the fastest); seat-based subscription models will see medium sensitivity (especially with layoffs, but on a lag); and that volume-based subscription models are the most defensive in the near-term, but may be the most sensitive long-term, owing to pricing pressure.

Customer success matters. We continue to lean on our six-factor recession sensitivity framework (see here), but also increasingly believe that companies that didn’t focus enough on customer success will be more prone to macro pressures. A few examples of companies not focusing on customer success include: 1) companies that have focused on raising pricing on customers or driving as many dollars out of customers as possible; 2) companies where there is a significant amount of shelfware; 3) companies whose business models don’t fully align with the customer or whose business models are misunderstood by investors; and 4) companies who over-promise and under-deliver

Layoffs in tech and weak job posting data. Given the widespread layoffs in tech (and increasingly in other industries), we believe software companies (especially those with seat-based models) are at risk, especially when over-indexed to tech. In addition, we believe that: a) layoffs may not be one-and-done and we may see further layoffs at tech companies; and b) we wouldn’t be surprised to see layoffs spreading to other sectors, especially given the ripple-on effects of tech layoffs. We would also point to weak job posting data for software companies as a leading indicator of softer demand

Are software companies finally finding religion on margins? In a refreshing turn of events, companies are showing upside on margins and management teams are discussing margin expansion. In addition, investors seem to be embracing the Rule of 40 as it was meant to be used (whereas, last year, we felt investors were willing to trade two points of margin for one point of growth). Having said that, we hope this discipline isn’t temporary and reactive to a slowing macro and have additional cautions on companies relying on large RIFs to save money (e.g. TWLO, DOCU), as well as high reliance on SBC

Renewals will be easier than new customer acquisition. We continue to believe vendors that can sell back into their base are in a better position vs vendors that rely more heavily on new logo acquisition. Logically speaking this favors larger, more established vendors that have a large renewal base vs smaller companies that rely more heavily on net-new business to drive bookings

True platforms win. We continue to believe customers will look to platform vendors (ideally a single SaaS code stack) to help them do more with less in times of IT budget uncertainty. To us this could continue to put pressure on point-based software vendors that could continue to be pressured by consolidation. We also continue to believe incumbency matters vs rip and replacement type deals

M&A heating up. M&A within the software space continues to heat up, as illustrated following the most recent deal announced between Thoma Bravo and COUP. We continue to believe billions in dry powder exists between strategic buyers, private equity firms and even sovereign wealth funds as we expect this trend to continue into 2023. We recently published a list of top M&A candidates within our coverage (link here) as we believe M&A could add an element of setting a floor on valuations.

Investing in talent vs. cost-cutting – what's the right balance? We see multiple puts and takes to cost-cutting measures. On one hand, RIFs can help reduce bloat at companies, increase efficiency, and (in theory) lead to margin expansion, at a time when profitability is top of mind for investors. On the other hand, we worry that layoffs are a sign of slowing demand and could compound the impact of a slowing macro on future numbers (which is likely not baked into estimates), especially for companies that we view as over-correcting. Furthermore, we're less certain that layoffs can truly lead to long-term margin expansion, given potential lower productivity and less focus on innovation.

Continued migration to the cloud, but also a focus on cost optimization. Based on our due diligence, companies are increasingly focusing on rationalizing cloud costs and reducing spend on specific vendors. For the hyperscale cloud vendors, this means more customers may adopt a multi-cloud strategy and be slower to move "up the stack", while for observability vendors, customers may look to monitor fewer workloads.

Industry Backdrop & Investment Considerations

According to Gartner, banking had the highest global enterprise IT spending of all industries with approximately $400B spent in 2021. According to an EY survey, 85% of banks are currently undertaking digital transformations to modernize their businesses and 60% of banks planned to increase their technology budgets. The P&C Insurance software market is estimated at $5.5B in the US and $15B globally. The wealth management industry has experienced significant growth in terms of assets invested by retail investors in the past several years. The investment management industry has long been dominated by fragmented, legacy solutions originally designed and implemented to achieve singular objectives.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Financial Applications						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
INTU	Intuit Inc.	117.7B	21.44X	8.62X	29.27X	11.77%	14.17%	35.39%	28.76%	17.74%	15.02%
TYL	Tyler Technologies, Inc.	13.9B	29.25X	7.52X	40.40X	7.70%	1.93%	25.47%	19.85%	1.33%	0.21%
SSNC	SS&C Technologies Holdin	13.3B	10.10X	3.82X		3.56%	7.41%	39.70%	25.59%	-11.50%	0.50%
BKI	Black Knight Inc	9.4B	16.22X	7.77X	57.69X	4.88%	-8.32%	39.19%	22.12%	-10.11%	-2.91%
CCCS	CCC Intelligent Solutions H	5.5B	20.13X	7.83X	39.37X	8.66%	9.66%	34.41%	12.93%	3.70%	1.92%
GWRE	Guidewire Software Inc	5.2B	2478.10X	5.45X	153.37X	10.52%	#VALUE!	-5.57%	-7.35%	-102.15%	13.11%
CWAN	Clearwater Analytics Holdi	4.3B	52.27X	13.83X	41.70X	19.46%	25.90%	28.84%	-0.66%	37.50%	21.02%
APPF	AppFolio Inc	4.0B	195.12X	8.38X	673.20X	21.90%	-55.46%	-3.31%	0.74%	-118.82%	2.95%
ENV	Envestnet Inc	3.3B	17.84X	3.15X		5.73%	-5.89%	17.95%	11.48%	-20.26%	-7.69%
NCNO	nCino Inc	3.0B	735.66X	7.46X	-120.68X	19.84%	-706.39%	-6.44%	-9.02%	-48.39%	1.16%
DCT	Duck Creek Technologies I	1.6B	52.38X	4.07X	1017.27X	11.43%	44.67%	7.13%	2.51%	20.00%	9.70%
QTWO	Q2 Holdings Inc	1.6B	46.43X	3.28X	-180.42X	13.62%	75.34%	4.70%	1.06%	-18.03%	-1.63%
ALKT	Alkami Technology Inc	1.3B	-65.33X	5.77X	-53.59X	26.24%	-55.81%	-15.99%	-21.46%	-0.41%	35.37%
MLNK	Meridianlink Inc	1.2B	13.56X	5.16X	17.11X	7.30%	6.22%	26.46%	31.41%	-12.82%	-1.76%
ENFN	Enfusion Inc	1.1B	56.60X	6.94X	230.01X	26.72%	169.30%	12.46%	-7.46%	-30.77%	36.09%
SPNS	Sapiens International Corp	1.1B	10.83X	2.12X	16.23X	6.65%	8.98%	17.66%	14.90%	2.59%	2.47%
EBIX	Ebix Inc	0.7B	8.17X	1.19X	9.84X	-1.42%	16.78%	11.96%	5.66%	-13.52%	-5.85%
PGY	Pagaya Technologies Ltd	0.3B	-20.99X	0.47X		-3.60%	-47.92%	#VALUE!	#VALUE!	26.47%	-33.73%
OSPN	Onespan Inc	0.5B	202.11X	1.86X		6.36%	-37.93%	-3.76%	-2.29%	-7.14%	-0.50%
BLND	Blend Labs Inc	0.3B	-1.21X	0.72X	-0.92X	-9.85%	-36.38%	-44.77%	-55.11%	-6.49%	-2.03%
FRGE	Forge Global Holdings Inc	0.3B	-6.15X	4.00X		39.45%	0.52%	6.49%	5.97%	-9.76%	-3.00%

Management Commentary

Guidewire (GWRE) Investor Day on P&C Industry and long-term targets…"But I want to make sure everybody understands that to really understand Guidewire requires an understanding and appreciation for the property casualty insurance industry. This is a $2.7 trillion industry that, in my opinion, is very concentrated. Those Tier 1 and Tier 2 insurance companies are -- the primary focus of Guidewire, and I think what we are uniquely suited and uniquely organized to support. The other thing that's important, especially nowadays to understand about P&C insurance is that it is a remarkably resilient industry. Next thing to understand about insurance is that it is somewhat -- and I don't want to offend anybody, but somewhat lagging behind the rest of the economy in terms of unlocking what I guess I'd call digital transformation, the modernization benefits associated with modern technologies. There is an efficiency opportunity to be unlocked in the insurance industry. And this is at the heart of the value proposition that Guidewire brings to bear. The ability for a carrier to interact with data differently and have constant and consistent underwriting and pricing events that inform that is now available better than it ever has been before. We are now targeting $1.1 billion to $1.2 billion in revenue in fiscal '25 margin profile of 60% to 63%. We haven't changed the longer-term target of $1.5 billion. You guys are all smart, you can do the math. We expect to cross that threshold in FY '28, but that is not an FY '28 target. As you think about subscription and support gross margins, we are feeling confident in how we are seeing the gains of GWCP to drive incremental margins. And so those healthy margins will certainly help us as we look ahead to our targets. We feel very confident in the investments we've made in the platform to support our incremental margins and operating expenses should be stable as we look ahead."

AppFolio (APPF) earnings call on Affordable Housing tailwinds, Apple Pay and short-term rentals…"Affordable housing is another significant multiyear expansion opportunity for us upmarket. We are focusing significant development efforts on expanding the foundational product capabilities and subsidy programs and LIHTC capabilities we already have in place to better support customers' needs in our corporate segment. Affordable housing is another example of an opportunity to provide a purpose-built solution to enable our customers to manage their entire business in one place on one powerful platform. In addition to incremental revenue generation in our payments value-added service, Apple Pay adds additional convenience to the payment process, helping us achieve greater adoption and use for the entire platform while contributing to growth and retention. Short-term rentals, which we announced at our customer conference, is another. Many of our customers have short-term rental units in their mixed portfolios, and this new future capability allows us to expand the types of customers we target. We are currently validating this new product with a select number of charter customers."

Intuit (INTU) on the growth-wheel effect…. "It is all about large TAM, low penetration, secular tailwinds, with a very clear game plan and enormous assets to deliver for our customers. And then last but not least is TurboTax Live is now a $1 billion business, growing 30% with a massive TAM that we have an opportunity to go after. When you look at Credit Karma, we have over 125 million members. We have incredible revenue per mile and 25% of the new members of Credit Karma came from TurboTax and payroll and 3x the number of TurboTax customers year-over-year put their refunds on a Credit Karma Money account. This transformation of our business plus the addition of Mailchimp is an opportunity for us to redefine customers and ARPC as we've added more vectors for growth."

Tyler (TYL) on its portfolio and industry…. "So we're narrowly focused on the public sector, but it's a very big vertical market, as you can imagine. And we're very broad in terms of the breadth of products we offer for the public sector and the levels of government we serve. We serve local government, which is historically sort of where we grew up and still the majority of our business, but also have a growing presence in state governments. So we provide essential back-office software that governments use to run essential functions. So things like public administration, so ERP systems, accounting, human resource, payroll, utility, billing, licensing and permitting, property tax systems, public safety systems, 911, police, fire and ambulance systems, Courts & Justice, so the whole justice process from the beginning of a trial through probation. We've had an increasing growth in a transaction-based business as well layered on top of our software around payments and other transaction revenue sources, convenience fees for transacting business with government through our portal, electronic filing in the courts. Generally, the budget backdrop from really kind of all levels of government is really pretty strong. At the local level, property taxes are a major revenue source. And even though the housing market may be slowing down somewhat, there's still property values that are pretty elevated. A lot of pressure on property taxes, but most of their revenue streams are really pretty strong. And then there's the federal stimulus ARPAs providing $360 billion of direct aid to state and local governments that kind of is working its way through the system over the next 3 or 4 years."

OptionsHawk Executive Summary & Focus Stocks

Yet again in software we are dealing with a handful of larger names and then a lot of junk with a select few treasures hidden among the trash. **Intuit (INTU)** is the largest, and best, name of the group at reasonable valuation with double-digit growth, strong FCF and rising estimates. **Tyler (TYL)** a former darling stock looks overvalued at 29X EBITDA and 40X FCF, a possible short. **SS&C Tech (SSNC)** is a deep value play working through some acquisitions and with easing comps in 2023 can be a solid turnaround story. In the $3B to $6B tier **Clearwater Analytics (CWAN)** once again screens as most attractive through carries the premium valuation of the group. I am not a fan of **Guidewire (GWRE)** which looks considerably overvalued. **AppFolio (APPF)** at 8.4X EV/Sales has always made sense as an acquisition target with its niche presence in real estate. Of the ten sub $2B market cap names **OneSpan (OSPN)** is a likely acquisition target. **Meridian Link (MLNK)** an interesting profitable name with more modest growth than peers but 31% FCF margins while **Alkami (ALKT)** would be the more speculative top-line growth pick while lacking profitability.

Software – Data Analytics & Business Intelligence

Components: SNOW, OTEX, INFA, AYX, MSTR, RAMP, PDFS, DOMO, CGNT, BBAI, IOT

International & Private Peers

Intro

This is a smaller software niche group and the backdrop mirrors that of the previously discussed groups. The volumes of data being created and needing to be managed continues to exponentially grow, and organizations are deploying more complex data architectures. The multi-cloud hybrid-cloud digital world of the future. There will be a need for automation and intelligence in the increasingly complex data world in the future. INFA has the potential to disrupt the large and growing data management opportunity with its next-generation IDMC platform. SNOW is a rapid growing leader that is seeing its multiple compress but a massive opportunity remains ahead.

Industry Backdrop & Investment Considerations

According to IDC, the markets for Analytics Data Management and Integration Platforms and Business Intelligence and Analytics Tools, will have a combined value of $84B by the end of 2023. According to IDC, enterprises use less than 1% of the data they generate, but the amount of data generated will grow at a 27% CAGR over the next 7 years. The broader data management / BI ecosystem will be well-positioned to benefit from the growing adoption of data prep and analytics - tools that are increasingly being made available to business users, not just the IT department. IDC estimates the broader business intelligence and analytic tools and analytics data management and integration platform markets are expected to grow at a 13% CAGR through CY24

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Data Analytics & Intelligence						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SNOW	Snowflake Inc	45.9B	310.40X	20.43X	128.92X	46.36%	141.47%	-2.56%	4.66%	120.00%	1.69%
OTEX	Open Text Corp (USA)	8.0B	8.35X	3.02X	14.33X	2.38%	6.93%	33.69%	25.44%	-2.77%	-1.88%
INFA	Informatica Inc	4.7B	15.64X	3.92X	27.49X	9.45%	15.94%	24.42%	15.09%	8.68%	5.31%
AYX	Alteryx Inc	3.4B	130.59X	4.72X	-53.80X	17.28%	-1078.88%	-0.32%	5.67%	-46.09%	16.43%
MSTR	MicroStrategy Inc	2.3B	51.71X	9.24X	56.12X	2.09%	-103.71%	17.59%	-496.40%	-1826.53%	-2.13%
IOT	Samsara Inc	6.7B	-74.97X	9.28X	-44.69X	28.48%	-1.03%	-26.63%	-44.55%	-65.22%	51.88%
RAMP	Liveramp Holdings Inc	1.5B	15.49X	1.72X	27.12X	7.91%	46.70%	7.93%	13.92%	43.27%	13.53%
PDFS	PDF Solutions, Inc.	1.1B	43.03X	7.14X	-213.00X	14.81%	47.99%	2.16%	0.17%	1590.00%	30.79%
DOMO	Domo Inc	0.6B	-304.93X	2.00X	-53.85X	10.07%	-104.36%	-11.07%	-2.38%	-52.54%	-3.34%
CGNT	Cognyte Software Ltd	0.2B	-4.39X	0.60X		-1.04%	-39.13%	13.90%	-3.20%	-243.12%	-31.14%
BBAI	BigBear.ai Holdings Inc	0.1B	-17.44X	1.82X	-239.94X	13.63%	-103.66%	-53.90%	-14.03%	811.11%	-0.38%

Management Commentary

Snowflake (SNOW) on its value…. "Snowflake continues to drive strong growth at scale, coupled with strengthened unit economics, operating profit and free cash flow. While we acknowledge the weakening global macro context, we remain resilient in terms of our results. We believe this resilience reflects the importance of data strategy in modern enterprises and institutions. Data is becoming deeply ingrained in how global enterprises think, act, decide and strategize. Relying on anecdotal observations will increasingly take a back seat to data-driven operations. As Mike said, financial is very much driven by the fact that historically, financial services institutions are pumping massive amounts of data around every single night to all these different destinations, especially in asset management and subsectors like that. So we really view -- I mean data networking plays out differently in every industry sector and subsector, but they become -- there's a lot of data gravity is what we call it that starts to happen that benefits us enormously. It really lowers the friction of getting access to new accounts, and you see that very pronounced in verticals like financial services."

OptionsHawk Executive Summary & Focus Stocks

Snowflake (SNOW) is an incredible company and growing rapidly but still trades at insane 20X EV/Sales, so not the buy and hold type, but certainly there are right market environments to own the best-in-class play while being agnostic to the valuation. **Informatica (INFA)** is the favored small cap as it checks all the boxes with it trading just 15.5X EBITDA with double-digit growth, strong FCF margins and rising estimates. **LiveRamp (RAMP)** is the value name in this group that could make for a nice acquisition target.

<u>Software – Enterprise Resource Planning</u>

Components: MANH, PATH, DSGX, HCP, SPSC, MNDY, PEGA, APPN, PRGS, ETWO, AI, AMSWA, UPLD

International & Private Peers

Intro

The demand environment for infrastructure software continues to soften with Q3 weaker than Q2 after Q2 came in modestly weaker than Q1. Though not violent, the magnitude of the slowdown appears on a steady trajectory and will likely persist into CY23. The primary mechanism by which slower demand trends are manifesting is via longer sales cycles as IT buyers hesitate on large-scale investments as opposed to instituting outright budget cuts.

Industry Backdrop & Investment Considerations

The first wave of cloud modernization within enterprises centered on core systems such as CRM and HCM. Increasingly we are seeing enterprises extend this modernization to front-to-middle and middle-to-back office processes that touch numerous core systems. These workflow, content, and process-centric apps tend to be supported in their "as is" state by custom applications or manual/Outlook/Excel-based processes. Accordingly, they are prone to error/ inefficiency and enterprises are investing to modernize. However, the process of developing modern custom applications can be a costly and time-consuming process requiring complex coding. Meanwhile out-of-the box packaged solutions often lack functionality and company-specific differentiation. To bridge this divide, enterprises are adopting ''low-code'' and BPM solutions.

According to the Low-Code Development Platform Market Research Report published by Prescient & Strategic Intelligence, the market for low-code development platforms was valued at $5.6B in 2018 and is expected to grow at a 45% compound annual growth rate to $52.3B in 2024. According to Forrester, the market for RPA automation totaled $3.9B in 2018 and is expected to grow at a 25% compound annual growth rate to $12.0B in 2023. According to Gartner, the global application PaaS market was valued at $26.4B in 2018 and is expected to grow at a 21% compound annual growth rate to $69.3B in 2023. Gartner estimates that in the next 5 years, at least 75% of large enterprises will be using low code tools and platforms for low code and citizen development initiatives. It is also expected that the low code application platforms will be used for 65% of application development activities amounting to $5.7B in revenue.

Based on estimates from IDC, Monday.com sizes the total addressable market (TAM) at $56.1B in 2020, growing to $87.6B in 2024 at 12% CAGR, consisting of collaborative applications at $21.7B; marketing campaign management at $14.3B; sales force productivity and management at $11.5B; project, software change, configuration and process management at $4.6B; and portfolio management at $4.0B.

The low-code no-code market is in the very early stages of adoption with low single digit penetration into a $40B-$70B opportunity. Gartner estimates that by 2025, 70% of new applications developed by enterprises will use low-code or no-code tools, up from <25% in 2020.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Enterprise Resource Planning						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
MANH	Manhattan Associates Inc	7.7B	37.77X	10.00X	45.45X	8.25%	8.29%	26.80%	27.30%	14.49%	14.80%
PATH	UiPath Inc	7.2B	111.03X	5.40X	-7.84X	18.16%	136.70%	8.28%	-7.62%	-1.67%	16.17%
DSGX	Descartes Systems Group I	6.0B	27.27X	11.96X	36.72X	9.72%	21.61%	24.35%	40.34%	0.89%	2.08%
MNDY	Monday.Com Ltd	5.5B	-62.99X	9.15X	-13.12X	29.91%	-2.54%	-17.07%	0.84%	0.00%	69.87%
HCP	HashiCorp Inc	5.8B	-29.31X	9.84X	-37.40X	27.84%	2.48%	-27.55%	-19.58%	14.52%	49.71%
SPSC	SPS Commerce, Inc.	4.8B	35.15X	10.20X	44.97X	16.46%	14.98%	24.08%	24.22%	11.00%	1.23%
PEGA	Pegasystems Inc.	3.1B	88.30X	2.72X	-523.53X	10.71%	-343.74%	2.01%	2.37%	-88.24%	-13.79%
APPN	Appian Corp	2.8B	-34.44X	5.73X	-21.26X	14.77%	-1.72%	-11.82%	-16.24%	66.30%	4.38%
PRGS	Progress Software Corp	2.2B	9.94X	4.38X	14.23X	2.59%	4.39%	43.13%	32.73%	0.74%	-0.10%
ETWO	E2open Parent Holdings In	1.7B	13.44X	4.37X		10.17%	-6.26%	-27.73%	4.55%	422.00%	40.75%
AI	C3.ai Inc	1.4B	-6.21X	2.03X	-4.63X	20.62%	-44.39%	-31.93%	-35.90%	-7.41%	4.25%
AMSWA	American Software, Inc.	0.5B	20.08X	2.94X	20.71X	7.38%	22.70%	13.58%	22.02%	-12.47%	1.21%
UPLD	Upland Software Inc	0.2B	6.57X	2.01X	20.17X	-0.26%	-4.90%	31.34%	13.45%	1.91%	-1.27%

Management Commentary

Monday.com (MNDY) on headwinds…. "First, we continue to see pockets of stress in our customer base, in particular, in Europe, with some indication of softness spreading to other regions. Second, since we have a large presence of business outside the U.S., the strong U.S. dollar has negatively impacted reported results and represents an FX headwind to revenue growth. Despite these uncertainties, new customer demand remains solid, and acquisition efficiency improved in Q3. While others are pulling back, we continue to see opportunities and invest for growth and gain market share. With our in-house business intelligence tools, big brain, we track every marketing campaign in detail, allowing us to easily adapt to changes in the business environment."

Manhattan Associates (MANH) on its portfolio demand…. "Importantly though, demand for our cloud solutions continues to be strong and resilient across our product portfolio. From a vertical perspective, retail, manufacturing and wholesale continue to drive more than 80% of our bookings in the quarter. And across our solutions, the sub-verticals are pretty diverse. For example, the quarter cloud deals included a manufacturer and distributor of engineered components, a sporting goods and outdoor recreational retailer, an aerospace and defense company, a grocery retailer, an appliance and electronics manufacturer and a food and beverage company, among many others. Our pipeline continues to be robust with solid demand across our product suites. Net new potential customers represented about 35% of that demand. And year-to-date, new logos have generated a full half of our total bookings. Now according to Gartner, the total addressable market for WMS and TMS are approximately the same size and present a significant growth opportunity for Manhattan. Both WMS and TMS markets are large, global and span nearly all industries. Manhattan active Supply Chain, which comprises of Manhattan Active Warehouse Management and Manhattan Active Transportation Management, affords us the ability to provide leading-edge supply chain technologies to customers across industries and across the globe. As supply chain practitioners hunger for continuous innovation, our truly cloud-native always current unified solution is uniquely positioned to provide the customers a platform for core development. And as a result, we're seeing a growing number of our Manhattan Active WM customers also subscribe to Manhattan Active Transportation Management. So in summary, Manhattan Active Supply Chain continues to be a real force in the market with new customers subscribing and existing customers going live on a weekly basis."

OptionsHawk Executive Summary & Focus Stocks

Manhattan Associates (MANH) and **Descartes (DSGX)** are both attractive names in this group with the latter a bit cheaper on valuation and with better metrics making it the favorite. **Hashi (HCP)** is a name that looks like it could be in for more pain with it overvalued and far from profitability. **SPS Commerce (SPSC)** a smaller name that consistently screens as a favorite and looks attractive despite elevated valuation with impressive metrics.

Software – Collaboration & Storage

Components: TEAM, DOCU, DBX, BOX, SMAR, ASAN, CVLT, CCSI

International & Private Peers

Intro

This group is seeing similar macro headwinds as well as industry-specific challenges. Box is seeing longer sales cycles from greater deal scrutiny and pressure on large deals. FX headwinds are an issue across much of the software universe. DocuSign is more of a wait-and-see restructuring, transition, turnaround story. Atlassian as a premier software asset longer-term, underscored by the company's highly attractive cloud transition, solid unit economics buttressed by its product led growth (PLG) heritage, and strong competitive positioning in secular growth markets (DevOps, ITSM, Work Management).

Industry Backdrop & Investment Considerations

The Collaboration, Communication, and Productivity software category addresses Content Services, Collaboration, Email, Office Productivity, eSignature, Creative Content, Consumer Tax, Contract Life Cycle Management, and Desktop as a Service. These categories have a $355B addressable market with an expected 5-year CAGR of 7.6%.

Gartner estimates that content services platform, enterprise file sync and share and communications and collaboration together constitute a $22B+ market opportunity. According to an IDC report, the markets for collaborative applications and project and portfolio management, in aggregate, are expected to grow to $32 billion in 2023.

Workflow management is another key area as companies look to make operations more efficient. According to Forrester Research, there are 1bn+ knowledge workers that could benefit from work management tools in some form which can lead to a TAM of ~ $50B.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Collaboration and Storage						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
TEAM	Atlassian Corp	38.2B	64.00X	10.93X	50.61X	24.54%	35.90%	22.58%	29.10%	-15.09%	29.13%
DOCU	Docusign Inc	12.0B	23.97X	4.70X	29.66X	7.98%	14.61%	19.89%	21.12%	-3.64%	19.55%
DBX	Dropbox Inc	8.6B	10.13X	3.78X	11.83X	5.89%	1.93%	29.98%	32.48%	-3.56%	-0.22%
SMAR	Smartsheet Inc	5.4B	-258.83X	6.55X	1904.17X	26.84%	-74.04%	-6.22%	-3.78%	0.00%	39.61%
BOX	Box Inc	4.8B	17.93X	5.32X	23.05X	10.77%	18.53%	19.83%	25.66%	3.54%	-0.27%
ASAN	Asana Inc	3.1B	-11.85X	4.71X	-13.97X	20.23%	-24.29%	-41.50%	-33.43%	20.83%	45.80%
CVLT	CommVault Systems, Inc.	2.9B	14.68X	3.28X	15.13X	6.63%	12.52%	21.01%	22.51%	11.02%	4.02%
CCSI	Consensus Cloud Solutions	1.2B	9.23X	4.94X	18.80X	6.50%	8.22%	50.19%	56.47%	1.49%	7.07%

Management Commentary

Atlassian (TEAM) on the long-term…. “Atlassian is not immune to the broader macroeconomic environment, but we remain steadfast in our conviction that we have the right leaders, products and strategies in place to capitalize on incredible long-term opportunities in front of us. We continue to have line of sight to $10 billion in annual revenue and believe we will come out of this environment in a much stronger market position. We also, in terms of think about what the opportunities and we said in our Investor Day kind of -- it seems like a long time ago now, but early this year, we said we have 3 really good opportunities that we were going to invest behind that was migrating our customers to the cloud at the fastest rate we can, building new products to that point A program and investing more in ITSM with our JSM platform there.”

DropBox (DBX) on universal search…. “You mentioned Command E. So for context, that's a universal search company. And that was really prompted by -- kind of going back to the same kind of thinking when I started the company, I'm like -- and actually, in a lot of ways, the same problem, like the problem when I started was like my stuff is everywhere, can't find it. In 2007, when I started the company, that meant like, oh, my files are on these different devices and these different operating systems that don't talk to each other. As an end user, this creates all these paper cuts for me of having to personally manage that. But then today, fast forward, and in principle, kind of a lot of the same problems. Like my stuff is everywhere. I can't find it, no way to organize it. Maybe it's not so much files and devices as much as just now I've got what used to be 100 files on my desktop is now 100 tabs on my browser because we've had this -- obviously, we still use files for a lot of workflows, but then there's this whole array of new cloud tools. So in addition to having an Excel spreadsheet, you might have Google slides and then a Figma doc or an Airtable. There's no container that can hold all of those things really if you think about it. So I mean that's a long preamble to say that Command E is a universal search company that's really doing this, like indexing all your -- it connects to all your SaaS tools and your files and your e-mail. And so you can have one search box that searches everything. So we bought that company about a year ago, putting a lot of investment in that area. And we've -- what I'm really excited about the road map there when I think about it, or if we were to build Dropbox for 2022, 2023, what I'd build, and universal search would be a big part of that.”

OptionsHawk Executive Summary & Focus Stocks

Atlassian (TEAM) is one of the most impressive software companies in terms of unit economics and has a long runway for excellent growth but remains a bit pricey 11X EV/Sales though ramping profitability will make it a better value soon and similar to SNOW as a best-in-class name worth owning in the right tape. **Box (BOX)** provides a nice combination of low valuation and strong profitability while **CommVault (CVLT)** attractive as a potential M&A target trading at a fairly cheap valuation.

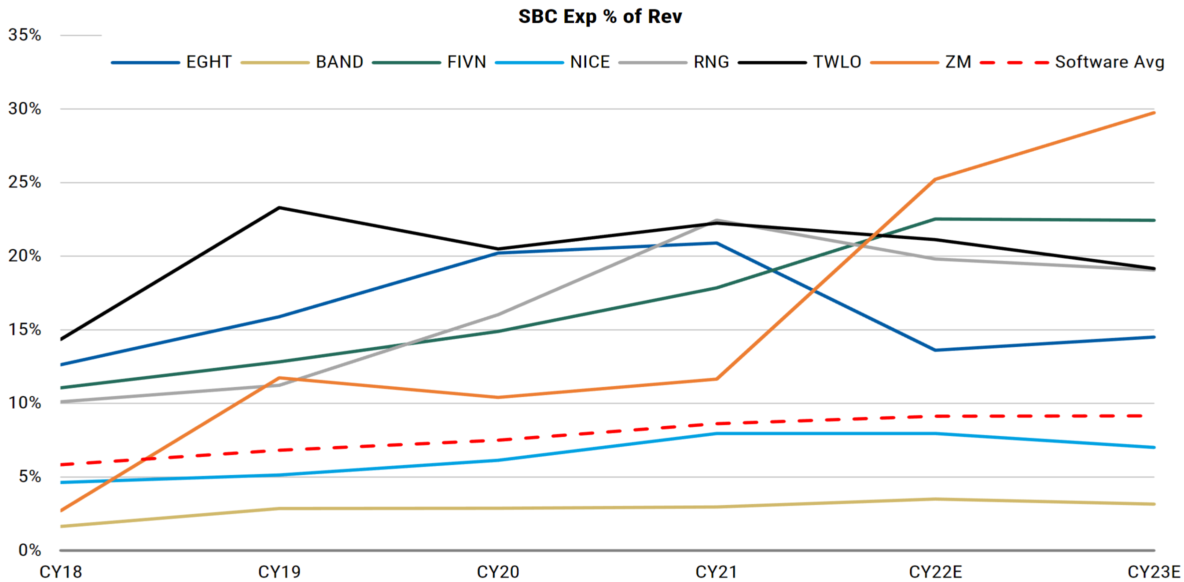
Software – Communications

Components: ZM, ZEN, TWLO, FIVN, RNG, SPT, EVBG, LPSN, ARQQ, VMEO, CRNC, EGHT, BAND, ONTF, API, AVYA

International & Private Peers

Intro

Communication software is also seeing macro uncertainty weigh with hesitation on larger deals though the overall demand environment has held strong to this point. CCaaS performed better than UCaaS, and remained a higher priority, but budget tightness began to have some impact on most communication software purchases. For UCaaS, large enterprise remains the area showing pockets of weakness; for CCaaS, it is more centered around SMB. The continued rise of stock-based compensation expense within comm software has become notable with the outsized growth in expense vs. the rest of software. Concerns around competition and commoditization have caused valuations to come in dramatically.



Industry Backdrop & Investment Considerations

The main markets in this segment include: UCaaS (Unified Communications as a Service), CCaaS (Call Center as a Service), CPaaS (Communications Platform as a Service), CEM (Critical Event Management), Project Management, and DaaS (Desktop as a Service). The total worldwide Unified Communications market is around $96B and cloud penetration is around 7% in 2020 or ~$7B and will grow at a 33% CAGR through 2025 to reach 30% penetration or $29B.Microsoft participates in most of the markets as a key competitor.

The Unified Communications market consists primarily of 3 main segments, including Telephony (~80% of overall spend), Conferencing (~10% of total spend) and Video Systems and related Infrastructure (~10% of total spend). The total worldwide Unified Communications market is around $96B. Cloud penetration is around 7% in 2020 or ~$7B and will grow at a 33% CAGR through 2025 to reach 30% penetration or $29B.

According to International Data Corporation, or IDC, the worldwide CPaaS market is forecasted to grow from US$3.3 billion in 2018 to US$17.2 billion in 2023, at a compound annual growth rate, or CAGR, of 39.3%. Within the CPaaS market, video is forecasted to grow from US$0.6 billion in 2018 to US$3.5 billion in 2023, at a CAGR of 43.6%. Voice is forecasted to grow from US$1.5 billion in 2018 to US$8.0 billion in 2023, at a CAGR of 40.8% and data (messaging) is forecasted to grow from US$1.0 billion in 2018 to US$4.5 billion in 2023, at a CAGR of 35.4%.

The market for Critical Event Management (CEM) solutions represents a $41.0B worldwide opportunity in 2020. Markets and Markets estimates that the aggregate market for mass notification software and services is projected to grow to $4.4B in 2020. Frost & Sullivan estimates that: (1) the market for IT service alerting is projected to grow to $753 million in 2020; (2) the market for telemedicine is projected to grow to $752 million in 2020; (3) the market for secure mobile messaging is projected to grow to $694 million in 2020; (4) the market for community engagement is projected to grow to $516 million in 2020; and (5) the market for IoT is projected to grow to $9.9 billion in 2020.

The market for Critical Event Management (CEM) solutions represents a $41.0B worldwide opportunity in 2020. Markets and Markets estimates that the aggregate market for mass notification software and services is projected to grow to $4.4B in 2020. Frost & Sullivan estimates that: (1) the market for IT service alerting is projected to grow to $753 million in 2020; (2) the market for telemedicine is projected to grow to $752 million in 2020; (3) the market for secure mobile messaging is projected to grow to $694 million in 2020; (4) the market for community engagement is projected to grow to $516 million in 2020; and (5) the market for IoT is projected to grow to $9.9 billion in 2020.

The market for automotive cognitive assistance is rapidly expanding. Tractica estimates that the automotive voice and speech recognition software market is expected to grow at approximately a 39% compound annual growth rate to $4.5 billion by 2025.

Compared to other software markets, the communication/collaboration space stands out as being in the very early stages of cloud penetration at 7% on average vs the overall average of 20%. Over the last several years, the technology has matured and the shift to software had accelerated. There are multiple long-term trends, both B2C and B2B, that should help these markets to grow at very high growth rates, including the convergence of telecoms and software, legacy products moving to the cloud, digital transformation, customer experience, omni-channel communications, mobile-centricity, and usability trends driven by Millennials.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change	SBC
Communications						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
ZM	Zoom Video Communicatic	21.4B	10.18X	3.71X	14.61X	5.40%	-6.12%	40.42%	35.60%	12.29%	-3.71%	477.287
TWLO	Twilio Inc	8.9B	24.44X	1.49X	-17.27X	16.53%	-178.65%	0.09%	-5.22%	-4.17%	-0.89%	632.285
FIVN	Five9 Inc	5.2B	39.96X	6.88X	229.03X	16.23%	5.37%	13.71%	-2.25%	19.74%	28.92%	108.805
RNG	RingCentral Inc	3.9B	14.22X	2.70X	49.04X	17.31%	46.02%	10.17%	-14.60%	16.33%	-0.71%	357.965
SPT	Sprout Social Inc	3.2B	369.07X	12.06X	294.07X	29.49%	-76.31%	-3.38%	7.39%	-23.08%	1.79%	21.73
EVBG	Everbridge Inc	1.3B	38.76X	3.67X	208.75X	6.29%	180.86%	0.34%	0.66%	145.83%	0.47%	44.095
LPSN	LivePerson Inc	0.8B	250.46X	2.25X	-21.62X	6.23%	-106.40%	0.37%	-9.60%	184.54%	-6.27%	69.656
CRNC	Cerence Inc	0.7B	33.18X	3.10X	259.41X	28.82%	375.83%	23.46%	-5.97%	-103.28%	-24.14%	24.076
BAND	Bandwidth Inc	0.7B	27.63X	1.73X	-275.31X	9.28%	41.45%	6.57%	-2.82%	523.33%	2.16%	14.537
VMEO	Vimeo Inc	0.6B	-18.63X	0.72X	14.39X	5.03%	-17.40%	-15.58%	3.96%	125.93%	-5.09%	44.893
ARQQ	Arqit Quantum Inc	0.7B	-41.48X	21.89X		281.55%	-513.02%	-2989.49%	########	-100.00%	-2.76%	10.93557
EGHT	8x8 Inc	0.5B	15.88X	1.23X	32.79X	6.01%	80.01%	1.66%	1.59%	425.00%	17.60%	133.331
ONTF	ON24 Inc	0.4B	-2.82X	0.22X	-1.51X	0.25%	-64.17%	1.01%	0.80%	1364.29%	-6.18%	25.65
API	Agora Inc	0.4B	0.64X	-0.30X		10.80%	-36.52%	-48.04%	-19.33%	39.68%	-1.69%	31.481

Management Commentary

Zoom (ZM) on momentum of growth initiatives…. "So continue to see growth in our Enterprise business, which we're really excited about in Q3, 20% year-over-year growth. Lots of strength and momentum continuing around Zoom Phone and very excited about the early indicators from Zoom Contact Center. So as a reminder, Zoom Contact Center is only about 3 quarters old, but you're hearing really good things and seeing some really great names there, so very excited about that. The online segment of our business was unfortunately still down year-over-year. So there's a couple of things about the Enterprise business, as I mentioned. First of all, continuing to see opportunity in meetings, as customers are really embracing flexible work, right? And realizing -- we've seen strength in our renewals, especially over the last couple of quarters in the Enterprise as organizations need to provide that flexibility and keep their employees productive. So that's, I think, a really positive sign for the future. We just talked about Zoom Phone. And then Zoom Rooms as well, as people are really thinking about, okay, this is how we're going to work now, right, especially in technology companies, making sure that they have the right systems in their conference rooms is really important, inclusivity and collaboration, making sure that they can foster that within their company so that nobody feels left out. So little by little, we're continuing to take market share. And then, of course, this expansion into the platform is really the big transformation and focus. So Zoom One, some of you have heard us talk about Zoom One, it's our bundle that includes Zoom Meetings, Zoom Phone, Zoom Chat and Whiteboard, and that is super early. It's only been out for like 5 months probably now, but saw a really good reception during Q3."

Twilio (TWLO) on margin declines…. "I know there's a lot of discussion about gross margins. And look, I get it. I acknowledge that historically, we've guided to a 60%-plus gross margin in aggregate for Twilio, and that we'd achieved that level by mixing more and more software into our revenue mix. But the telecommunications ecosystem and our business has changed since we set that goal, so I want to shed some light on what's driving our recent decline in gross margins and why as a business we're more focused on driving gross profit dollars. Messaging is the biggest and fastest-growing portion of our communications portfolio and has been the key contributor to our recent gross margin decline. Carriers charge a fee to access their customers, and we pass that fee along, both in the U.S. and internationally. And internationally, it's generally higher. Those fees have gone up over time as this space has matured and taken off over the years. The international market has operated this way for several years. And more recently, in the U.S., those fees, we call 10DLC fees, were recently introduced. Because we pass these through to customers at no additional margin, our gross margin percentage has dropped. Furthermore, our international messaging traffic has seen strong growth, which has put further pressure on our gross margin percentage."

OptionsHawk Executive Summary & Focus Stocks

Zoom (ZM) growth continues to come under pressure, making it a name to avoid despite having strong FCF margins and trading less than 15X FCF. **Twilio (TWLO)** is a cash incinerator with huge amounts of stock-based comp expense and lacks profitability. **Five9 (FIVN)** remains the best-in-class name in this group and is seeing strong upward revisions while **Ring Central (RNG)** is starting to look cheap enough to attract takeover interest. None of the sub $2B names look worth an investment.

<u>Software – Specialized Applications</u>

Components:

Mobility: UBER, LYFT, DASH, GRAB, AUR, KARO

Education: PWSC, COUR, BLKB, UDMY, DCBO, DUOL, TWOU, NRDY, CHGG, INST

Healthcare: VEEV, PHR, MODN

Other: ALRM, JAMF, AGYS, STER, SSTI, AVID, MOND, EB, HRT, SOUN, DMRC

International & Private Peers: iFlytek

Intro

This is a wide-ranging group focused on specialized applications within key verticals utilizing software applications. With the more focused verticals, and thus smaller TAMs, we see mostly small caps across this group. One exception are the ride-hailing apps and local transportation (Mobility), LYFT, DASH and UBER, which have the largest market caps tackling a large mobility theme and last-mile logistics. TYL is another one of the larger names with its focus on the public sector while VEEV/PHR/SOPH are focused on the Life Sciences industry. The educational software is also well-represented with PWSC, DCBO, CHGG, COUR, NRDY and TWOU. APPF is a software provider to the real-estate industry.

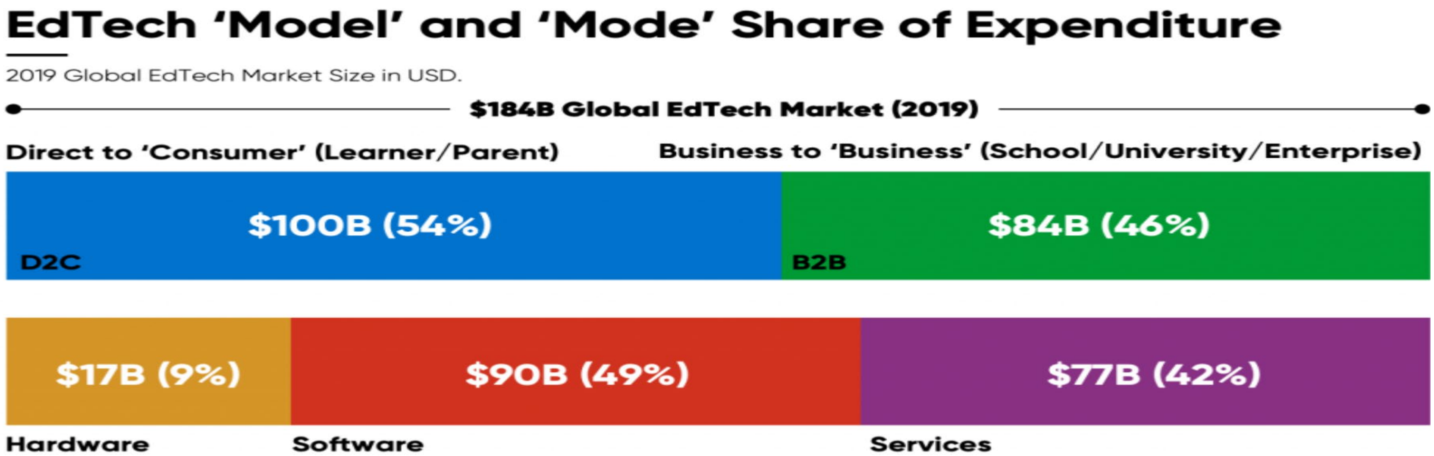
The gig platform names (DASH, UBER, LYFT) have seen investor concerns related to the regulatory environment and what it looks like going forward (particularly around incremental costs related to driver pay & benefits) have been an overhang on the sector. UBER's rideshare business currently has 3.1% user penetration of its 2.5bn current addressable population. Active driver trends continue to improve with mobility drivers on par with 2019 levels. Driver engagement (hours available) is also increasing, as global driver supply hours are above '19 levels. LYFT has seen issues with the impact of insurance inflation. The durability for forward bookings growth will be the key focus in 2023 with 85% of cost structure variable in nature.

For Education software, demand in the K-12 Education vertical remains steady due to stable funding and covid-catalyzed demand for digital solutions. Degrees continue to face challenges given enrollment trends particularly in the US. The National Student Clearinghouse released initial Fall 2022 enrollment data for Higher Education, indicating a ~1% YoY decline in overall enrollment for this Fall Semester. While still down on a YoY basis, the data shows a slower pace of decline than in recent years and is beginning to return to the decline trend observed pre-pandemic. CIO surveys suggest a lower overall IT budget priority for Corporate Learning & Development initiatives. Bulls continue to view talent development, learning, and upskilling platforms as a longer-term strategic priority for companies, closely aligned with business goals of driving higher productivity and digital transformation, which only increases during weaker hiring environments given talent gaps and staffing constraints. Bears view enterprise learning tools as more of an employee benefit, with the potential for slower headcount growth and/or right-sizing of enterprise workforces ahead pressuring demand. Additionally, companies tend to use multiple learning content providers for a variety of enterprise learning needs, meaning these platforms simultaneously face intense competition for enterprise budget dollars, while also facing consolidation risk to more platform oriented providers in the event of budget pressures.

Industry Backdrop & Investment Considerations

RP estimates a $19B market opportunity for its real estate data analytics software solutions. According to Frost & Sullivan, the global total addressable market, or TAM, for Apple Enterprise Management is estimated to be $10.3 billion in 2019 and is expected to grow at a compound annual growth rate, or CAGR, of 17.8% to $23.4 billion by the end of 2024.

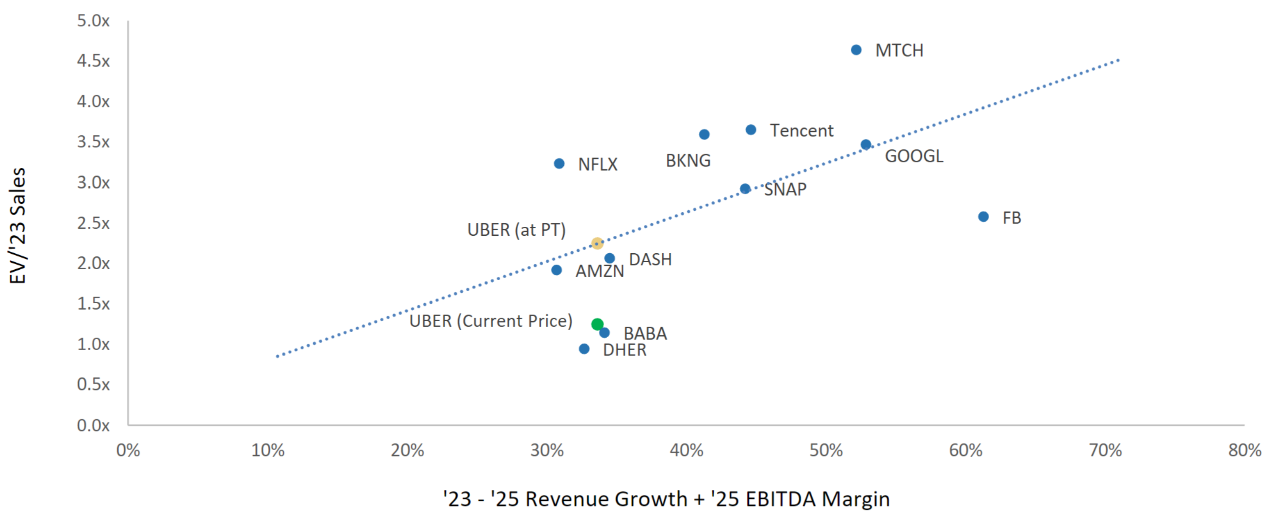
Over the past couple of years, we've seen rapid growth in the education-to-employment segment of the edtech sector that serves adult learners. With a near-record number of US jobs going begging, thanks to a tight labor market, attracting and retaining talent has become a core challenge for many firms. To meet the demand for upskilling and reskilling, online-education companies are expanding and emphasizing their enterprise offerings. Governments, employers and consumers together will spend over $7T a year on education and training by 2025. EdTech is growing at 16.3% and will grow 2.5x from 2019 to 2025, reaching $404B in total global expenditure. Even at this level, EdTech and digital expenditure will only make up 5.5% of the $7.3T global education market by 2025. The K-12 segment led the market in 2021, accounting for over 40% share of the global revenue. The preschool segment is expected to register the fastest CAGR of almost 18.2% from 2022 to 2030. A short-term surge in EdTech spending brought on by COVID-19 is expected to re-calibrate to a longer-term integration of digital technologies and transition to much higher adoption of online education over the coming years. In addition to EdTech's primary role supporting the formal education sector, B2C EdTech models are also on the rise as students, parents and workers increasingly seek learning support and up-skilling for supplemental and/or more direct academic and career outcomes.



Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation and Comps



Management Commentary

Uber (UBER) earnings call on mobility trends, Delivery and Cross-Sell…"Underlying this performance are several trends that represent tailwinds for us: cities are reopening, travel is booming and more broadly, a continued shift of consumer spending from retail back to services. We've seen these trends continue into the fourth quarter, with October tracking to be our best month ever for Mobility and total company gross bookings. Seasonal trends remain the same. Even lower-income riders continue to have higher trips per rider as things are opening up, showing absolutely no signs of slowing down. And we've also specifically looked at Europe with inflation, with the European economies, I think, leading in terms of weakness as far as the Western world. Again, we've looked to see if there's any weakness and we're not observing any weakness. When we look at Delivery as well, the Delivery business, as you saw, accelerated a bit against Q2. The frequency of ordering per monthly active platform consumer remains consistent, and it remains consistent not only in the U.S. and abroad as well. So while we have looked for signal, we're not seeing any signal. We're going to be cautious going forward. We're going to be cautious on costs. We're going to be cautious on overhead. But as far as the business goes, right now, we are seeing strength across the board. We are actively cross-selling delivery, consumers, food delivery consumers into grocery, grocery consumers into alcohol and then actually back now to Mobility as well. So all of the cross-sell that we have across the platform continues to increase, drive new customers and also drive retention as well. And then for us, also some of the growth initiatives that we have are designed to drive frequency. This is hailables and taxis, 2-wheelers, 3-wheelers and lower-cost product as well. When you put it all together, it drives healthy gross bookings growth and generally higher frequency per audience. So we like the tools that we've got, and we think there's a ton of upside for us on the frequency side."

PowerSchool (PWSC) on growth drivers…. "With the expected long-term growth in virtual schooling globally in the coming years with a very large TAM, we are excited to partner with global online companies like Stride to grow this space further. The other key growth factor for us is we have the most comprehensive and diverse portfolio of solutions that provide mission-critical capabilities required for the K-12 education ecosystem. There is no shortage of headlines about the stresses in our education system around teacher shortage, learning gaps, attendance shortfalls, social emotional support, equity and data security. Our differentiated platform with 19-plus products is becoming even more essential to help districts deal with these challenges and initiatives that span across operations, Talent and Classroom. We are seeing continued high demand and growth in our student solution, our insights and MTSS capabilities, talent management and behavior and critical management solutions. We are continuing to see balanced demand across our product portfolio. We recorded nearly 500 new logos and cross-sell transactions in the quarter, including several sizable wins for SIS, Unified Insights, Talent, Naviance and Classroom products. As we shared, one of our newest growth vectors is our international expansion. One of the key aspects that is driving our growth is our scale, proven track record and vast experience, which allows us to quickly meet and support the most critical urgent needs the districts might have."

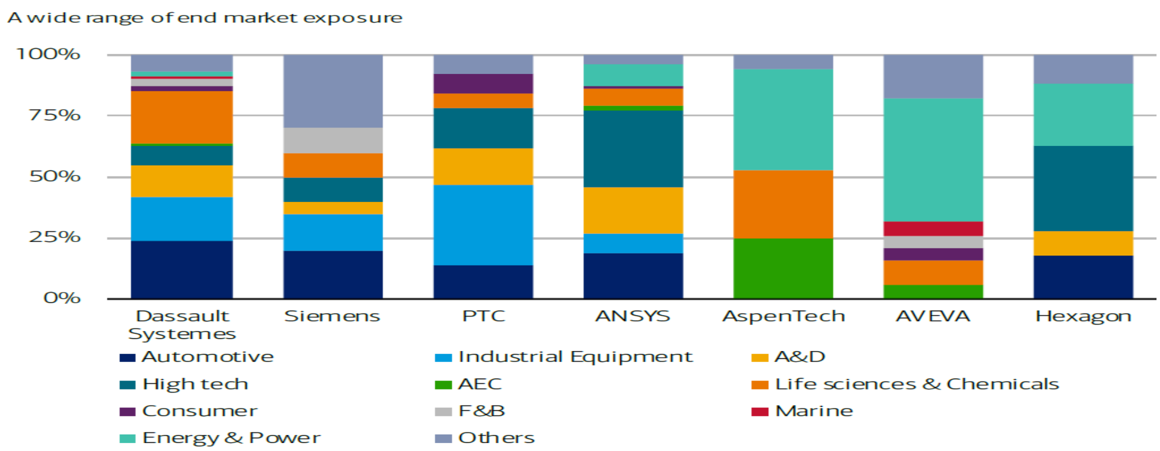
OptionsHawk Executive Summary & Focus Stocks

Uber (UBER) has shown a strong ability to surprise to the upside on profitability and is becoming an interesting investment while **DoorDash (DASH)** trades richer on valuation but has the best unit economics of the names. **Karooooo (KARO)** is a small cap international name that screens extremely attractive at 7.5X EBITDA and 18X FCF with impressive growth and is worth a deeper look because it is hard to see why it is priced so cheap. In EdTech I think we could see a lot of M&A with **Chegg (CHGG)** a potential target but in terms of the best-looking names it is **Powerschool (PWSC)** and **Instructure (INST)**, the latter I favor a bit more. In the Healthcare vertical **Veeva (VEEV)** remains over-priced as a potential short while **Model N (MODN)** screens very healthy. **JamF (JAMF)** looks interesting with major growth and still just 35X FCF with strong economics. **Agilsys (AGYS)** trades rich but is in a positive revision cycle due to its exposure to the Hospitality industry, a momentum trade for now that could eventually become a tough comps short. **Avid Tech (AVID)** screens insanely cheap despite very healthy metrics and would make a nice acquisition target.

Software – Engineering & Design

Components: SNPS, ADSK, CDNS, BSY, U, PCOR, NATI, ALTR, CINT, MTTR, CEVA, MTLS, ATOM, AIP

International & Private Peers: Dassault, Aveva, Nemetschek AG, Hexagon AB, Siemens



Intro

The leading chip engineering services plays, CDNS and SNPS, are down on the year but have fared better than the chipmakers and gives further credence to our long belief that owning those names is the best way to participate in secular growth trends in Semiconductors. The main risk and overhang to the group are the China restrictions and potential for those to become more stringent. Recent US DoC restrictions have targeted EDA activity supporting development of high-end AI/compute (leading edge) applications. While broader semis are more cyclical, EDA vendors are exposed to more resilient semis R&D budgets (limited cuts to maintain development of next gen products) as well as highly recurring revenue models.

Autodesk's and Procore end-markets during a recessionary environment could struggle due to the cyclicality in areas such as manufacturing and commercial/residential construction. Bentley Systems, on the other hand, has strong exposure to infrastructure which has some positive tailwinds.

Industry Backdrop & Investment Considerations

According to CIMdata, the overall PLM market is estimated at $57B in 2021 and expected to grow to $87B by 2026, a 9% CAGR, and is seeing very resilient share with limited inroads from cloud-native competition. Automakers have historically been the leading sector for PLM implementations, as automakers aim to differentiate their products by competing on quality, comfort and safety. CAD helps scale down production costs by reducing the number of expensive car prototypes, while CAE simulation helps reduce product recalls that are a seemingly inevitable part of the industry.

The overall cPDM market is estimated at $10bn in 2021 growing to $15bn by 2026 (7% CAGR). It serves as the backbone and platform for all PLM tools, as it manages all the data cross the lifecycle of a product. Key players include Dassault (ENOVIA/3DX), Siemens (TeamCenter), PTC (WindChill), Aras and SAP.

The overall CAD market is estimated at $8bn in 2021 growing to $11bn by 2026 (6% CAGR). CAD modelling software that allows users to create and design 3D renderings of products or plant assets and use those digital models to train workers, define and solve problems, and improve design productivity for faster time to market. Key players include Dassault, Siemens, Autodesk and PTC.

The overall CAE market is estimated at $8bn in 2021 growing to $13bn by 2026 (10% CAGR). CAE is also often referred to as simulation & analysis tools (S&A), CAE is more niche and less fragmented compared to the broader PLM market. Key players include specialists like ANSYS, MathWorks, Altair and MSC Software, as well as larger PLM players like Dassault and Siemens.

The overall AEC (Architecture, Engineering & Construction) market is estimated at $6bn in 2021 growing to $13bn by 2026 (15% CAGR), reflecting the need for the sector to digitise to address considerable inefficiency in terms of time, capital and energy. Key players include Autodesk, Bentley, AVEVA, Nemetschek and Trimble.

PLM software tends to be very sticky and customers rarely switch onto competing software platforms given unwanted inefficiencies of integrating a new system. Once engineers are trained on a specific platform, it becomes difficult to change them from a training and cultural standpoint. Therefore, it is challenging for firms to gain market share in the space, and early winners have dominated the market. While Autos and Aerospace are early adopters and big users of PLM, other sectors have increasingly adopted PLM tools in the last couple of years, particularly in electronics, AEC and life sciences. From a customer standpoint, the PLM market generally serves discrete manufacturers and, to a smaller extent, hybrid manufacturers (i.e. Pharma and Life Sciences). Automotive (24%), Industrial equipment (20%), and Aerospace & Defense (17%), and High Tech (17%) manufacturers make up the majority of the market.

The key structural trends shaping the industry, in particular cloud migration, Industry 4.0 and dynamics across verticals.

The electrification and roll-out of electric vehicles make a clear case for growth in simulation software that is needed to model real-time outcomes and monitor vehicle performance. There is also more demand for higher interoperability among PLM tools to connect vehicle design, engineering changes and prototyping together with manufacturing and sales. Medium and long-term outlook for the CAE market is strong, driven by secular growth in digitalization, re-shoring, and the increasing need for manufacturers to improve operational efficiencies and automate production.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

EV/Sales to Revenue CAGR

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change	SBC
Engineering & Design						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
SNPS	Synopsys, Inc.	49.4B	22.49X	8.26X	33.36X	10.83%	13.16%	32.96%	23.17%	11.90%	5.66%	55.134
CDNS	Cadence Design Systems Ir	44.5B	27.87X	12.62X	39.34X	9.90%	15.07%	36.10%	34.60%	12.53%	5.63%	210.09
ADSK	Autodesk Inc	41.9B	22.47X	8.53X	26.61X	9.48%	10.50%	31.86%	33.39%	-2.50%	-1.53%	558.5
U	Unity Software Inc	11.9B	-351.87X	8.66X	-250.69X	61.44%	-278.48%	-4.56%	-13.81%	128.13%	-7.99%	347.159
BSY	Bentley Systems Inc	10.9B	34.57X	11.51X	47.22X	9.58%	12.35%	31.72%	28.03%	1.22%	-2.85%	49.045
PCOR	Procore Technologies Inc	7.1B	-193.37X	9.33X	-137.34X	23.20%	-2.64%	-5.68%	1.77%	-23.68%	6.77%	227.161
NATI	National Instruments Corp	5.1B	14.33X	3.30X	29.97X	6.91%	21.20%	15.68%	6.69%	199.22%	13.46%	74.712
ALTR	Altair Engineering Inc	4.0B	42.21X	7.10X	294.44X	8.85%	12.33%	15.09%	10.04%	-6.96%	-3.15%	44.549
CINT	Ci&T Inc	0.9B	12.26X	2.27X		28.43%	40.31%	#VALUE!	9.17%	-11.76%	-3.14%	
MTTR	Matterport Inc	0.8B	-2.83X	2.28X	-2.39X	26.30%	-4.09%	-41.41%	-42.11%	82.61%	23.57%	100.605
CEVA	CEVA, Inc.	0.7B	28.71X	3.94X	-1145.16X	4.05%	23.01%	18.53%	19.24%	18.70%	10.53%	13.055
MTLS	Materialise NV (ADR)	0.5B	20.69X	1.93X	89.08X	12.15%	-672.04%	5.95%	6.87%	-59.38%	14.43%	-1.036
ATOM	Atomera Inc	0.2B	-13.17X	400.38X		125.00%	4.08%	-3139.00%	-3137.50%	0.00%	-42.86%	2.973
AIP	Arteris Inc	0.1B	-1.81X	0.82X	-3.91X	26.56%	-26.30%	-41.04%	-4.28%	-36.05%	2.80%	5.51

Management Commentary

Synopsys (SNPS) earnings call on demand drivers and vertical showing strength…"Over the last 5 or so decades, semiconductor chips and software have transformed every aspect of our world. From traditional computers to networks to mobile devices, from entertainment systems to home security, to medical wonder machines. Every vertical market is affected and expecting more. As a result, not only does the world demand more chips, but more chips are being designed by an expanded group of semiconductor and systems companies. Those chips are much more complex. They need to be designed faster due to time-to-market pressure and with increasingly constrained engineering talent resources. On top of this, security, safety and reliability are now a must for markets such as robotics, automotive and aerospace. Meanwhile, more and more systems companies from large hyperscalers to AI startups to verticals like automotive have decided to own their destiny and design their own chips and systems to accelerate their differentiation. Today, Synopsys is successfully bridging technologies from silicon to software to systems as we engage with all these companies. Our emulation and prototyping solutions are now essential to verify and optimize the interplay between hardware and software in the system. And in addition, we continue to grow our solutions that enable high-quality and more secure software as well as provide security IP blocks. Our Fusion Compiler product continues to drive accelerated growth and competitive wins across market verticals and a broad swath of technology nodes. Demand is particularly high in markets such as high-performance compute, AI/machine learning, automotive and mobile where systems are fueled by Smart Everything, high-speed and secure connectivity and advanced process geometries. In this context, our ARC Vision processor IP was named Best Automotive AI Solution by the Edge AI and Vision Alliance."

Autodesk (ADSK) on more resilient under new model…. "The last thing I would say is that one of the other benefits of being in a subscription business model versus where we had been before in a perpetual license model, in that perpetual license model, customers could purchase a perpetual license and continue to use the software even without paying us anything. In a subscription business model, a customer needs to be paying us on an annual basis in order for us -- in order to be able to use their software, which, as I said, is software that they need in order to get their jobs done. So it's that stickiness. It's that need to be using our software that shields us a bit more in this macroeconomic context versus what we might have seen back in the global financial crisis. In our Construction business, specifically, in preconstruction, we have an offering called BuildingConnected where we get insight into bidding activity with general contractors and their subs. And bidding activity is a good indicator for us of downstream construction volume. And so we continue to see record high bidding activity on our BuildingConnected platform."

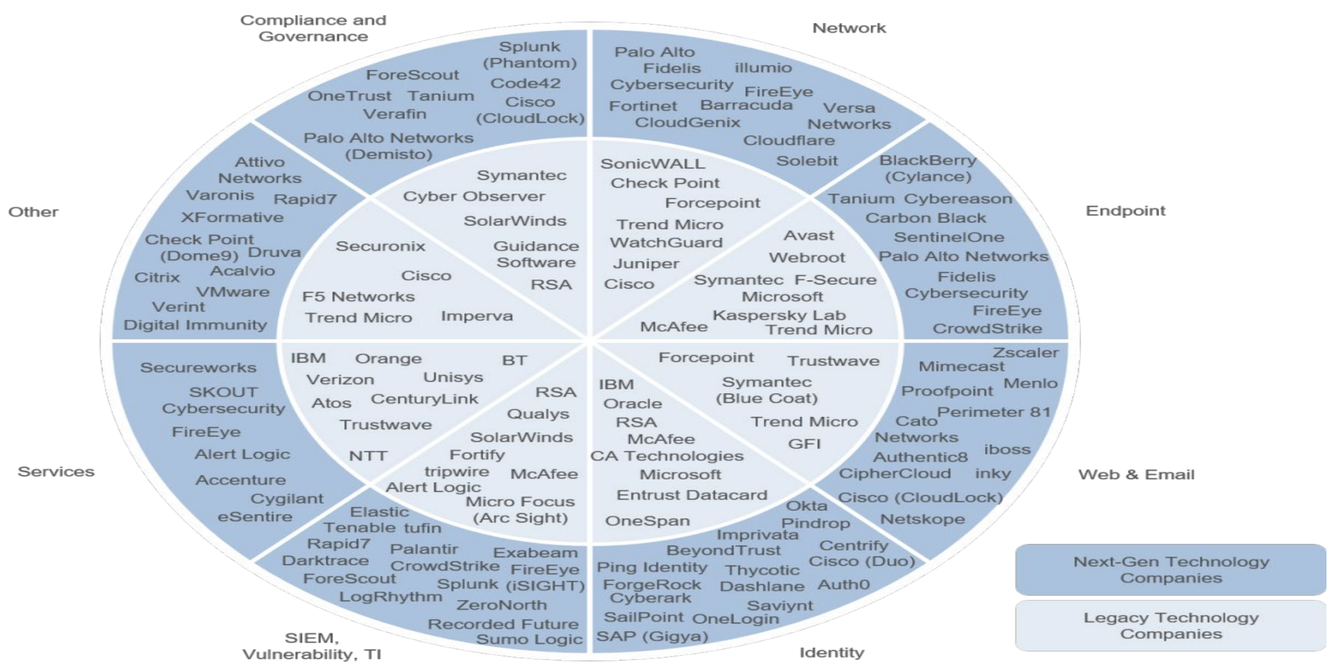
Bentley Systems (BSY) on demand indicators…. "While Nicholas will follow me by reviewing the tone of business at the level of products and regions, the headline is accelerating new business momentum in the U.S., which constitutes fully half of our business at current exchange rates, consistent with long-standing expectations about the inception of funding from the Infrastructure Investment and Jobs Act. To drill down on the tone of business for U.S. civil engineering firms, many of us track the Dodge Engineering News Record quarterly survey of trends in their backlog, which look like this last quarter. And here, we can see this quarter's further expansion and the current multiple of the backlog these firms consider ideal. Given this dilemma, their preference is certainly to increase their infrastructure engineering capacity by going digital rather than to reduce their intake of this new business. Turning now to the latest ACEC quarterly survey of engineering firms, not limited to civil, one can see the magnitude of these current backlogs tending around 1 year. The point is that this bulging backlogs provides these firms with perhaps unprecedented visibility. In fact, the ACEC survey includes these expectations about the level of backlogs a year from now. I think the increase expected here corresponds to these engineers tracking of the IIJA flows. And I believe this crowd sourcing can help us to anticipate BSY's forward tone of business also. We took note last quarter of this dichotomy between engineering firms, skepticism about the overall economy and their optimistic sentiment about engineering workloads and their own prosperity, which has only become more extreme in each direction since then. The resources sector continues to lead as to relative new business strength in sequence, mining and other environmental modeling and an offshore engineering increasingly for wind power. All in all, I think we are seeing a pleasingly sustainable balance of new business across all infrastructure sectors."

OptionsHawk Executive Summary & Focus Stocks

Synopsys (SNPS) and **Cadence (CDNS)** have been excellent investments and will remain more resilient than the chipmakers as the cycle weakens. **Synopsys (SNPS)** trades cheaper and is the preferred name of the two but both are worthwhile investments. **Unity (U)** and **Procore (PCOR)** are both overvalued while struggling to be profitable and seeing a lot of Stock-based-comp expense. **Bentley (BSY)** is a quality name in this group and often overlooked but **Autodesk (ADSK)** offers a similar growth profile with better margins at a much cheaper valuation. **Altair (ALTR)** is another name that looks to be a short. **National Instruments (NATI)** is a value name in this group that has a solid growth outlook as a safer play. **CEVA (CEVA)** is the smallest name that trades attractive as it works through a slowdown in royalties.

Software – Cyber-Security

Components: PANW, FTNT, CRWD, ZS, PLTR, CHKP, NLOK, OKTA, CYBR, S, QLYS, KNBE, TENB, YOU, VRNS, BB, FORG, RPD, RDWR, AVPT, SCWX, NTCT



International & Private Peers

Intro

Cyber-Security is not immune to the pressures facing the rest of the software industry but remains a priority for CIO spending in a rising threat environment and critical part of maintaining operations. An evolution is underway to more modern technologies like SASE and cybersecurity tends to be more resilient to macro-economic conditions. The Firewall market is now going through the standard 3-5 year product refresh cycle and customers are choosing to adopt last-generation hardware as well as early ordering of appliances to meet capacity needs in the face of continued supply constraints. In endpoint security, the product is slowly becoming commoditized with many security players providing some form of an endpoint solution. The drivers around endpoint security are beginning to revolve around integrated platform approaches and module efficacy. Ongoing pricing pressure is part of any endpoint solution, but is offset by cross sell and upsell of new products and modules. Cloud security, Application Programming Interface (API) security and data security are emerging as the key areas for investments.

Most budget increases for 2023 are allocated to the procurement of new solutions to address emerging security needs in cloud. The average Fortune500 and Global2000 customers have between 50-70 security tools in their arsenal, with many expecting to add multiple security products throughout the upcoming year. Heading into 2023, CISOs are most focused on purchasing solutions that solve pain points across cloud security, data security, application security and software supply chain security. The use of APIs has exploded with the adoption of cloud computing, creating an ever-growing attack vector. Since APIs are direct connectors, they are incredibly vulnerable to attacks as once cyber criminals have compromised an API, they have access to sensitive data, account credentials and other critical digital network assets. API security is relatively new, as APIs that are utilized in the development of cloud native applications are much more vulnerable than APIs utilized in an on-prem network, which can easily be locked down.

Industry Backdrop & Investment Considerations

Cyber Security software is a category that can be broken down into Endpoint, Identity, Network Security, Data Security and Vulnerability Risk Management. Cyber-security solutions can be categorized using various methodologies including the type of vulnerability addressed (e.g., remote worker authentication, network incursion), the delivery method of the solution (e.g., hardware, software, services), or the targeted customer group (enterprises, consumers).

Gartner has recently estimated the market to represent an opportunity of $153B for 2021 growing to $214B by 2025, representing a CAGR of 8.7%. According to Gartner, organizations' IT security spending as a percentage of total IT spending currently stands at around 5.7% (as of 2019) and is expected to grow in the next few years. Gartner estimates end-user spending in the Network Security market at $17 billion for 2021 growing to $20 billion by 2024, representing a compound annual growth rate of 6%. Gartner estimates end user spending in the Application Security market at $3.7 billion for 2021 growing to $4.7 billion by 2024, representing a compound annual growth rate of 9%. Gartner estimates end user spending in the Identity and Access market at $13.7 billion for 2021 growing to $19 billion by 2024, representing a compound annual growth rate of 12%. Gartner estimates end user spending in the Infrastructure Protection market at $23.5 billion for 2021 growing to $35 billion by 2024, representing a compound annual growth rate of 14%. Gartner estimates end user spending in the Data Security market at $3.4 billion for 2021 growing to $5 billion by 2024, representing a compound annual growth rate of 14%.

Gartner estimates end user spending in the Integrated Risk Management market at $5.4 billion for 2021 growing to $6.8 billion by 2024, representing a compound annual growth rate of 8%. Gartner estimates end user spending in the Consumer Security Software market at $6.9 billion for 2021 growing to $7.9 billion by 2024, representing a compound annual growth rate of 5%. Gartner research estimates that by 2024, 25% of midsize enterprises will have adopted security awareness training as a managed service, a sizeable increase compared to less than 5% as of July 2020. , Gartner had estimated the Security Awareness Computer-Based Training market at $600M, growing 47% Y/Y.

IDC sees a CAGR of 11.9% through 2024 across Corporate Endpoint Security ($9.7B growing to $12B), Cyber-security Analytics, Intelligence, Response and Orchestration ($13.1B growing to $17.1B), and IT Operations Management ($5.1B growing to $11.1B). A June 2021 IDC market forecast projects that the global Cloud Workload Security market will grow to $2.2B in 2024. IDC estimates a 14.8% 20-25 CAGR to the market with the fast-growing public cloud services market as a driver. Security Compliance is a $7.2B market, Cloud Integration & Migration a $3.1B market and DPaaS a $4.8B market. Workforce Identity is a $45B market broken into $15B for IGA and PAM and $30B from CIAM. Within endpoint security, CrowdStrike (CRWD) targets the higher end of the market, SentinelOne (S) targets the mid-market, while Microsoft targets the lower end of the market.

Overall, the IT Security industry is poised for growth, driven by 1) complex hybrid environments, 2) higher number of cyber-attacks, and 3) rising costs of addressing and remediating cyber-attacks. The large volume of well-publicized threats this year (including Colonial Pipeline, JBS, and Kaseya) are some of the most substantial breaches we have seen and continues to drive robust spending for security software. Digital transformation, expansion of attack surfaces, an elevated threat environment, and widely publicized security incidents continue to drive accelerated demand for Next Gen security. Endpoint remains the greatest spending priority for CIOs over the next 12 months within Security followed by Identity, Network Security, Data Security, and Vulnerability Risk Management.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, Operating Margins, FCF Margin, Rule of 40, Customer Acquisition Costs, LTV/CAC, EV/Gross Profit

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change	SBC
Cyber Security						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
PANW	Palo Alto Networks Inc	46.1B	27.80X	6.68X	24.11X	21.28%	24.60%	18.95%	32.57%	40.73%	26.35%	1013.4
FTNT	Fortinet Inc	40.8B	31.37X	9.03X	29.27X	21.67%	20.84%	26.20%	36.02%	16.63%	3.02%	211.2
CRWD	Crowdstrike Holdings Inc	27.0B	59.39X	11.33X	39.76X	32.71%	40.91%	13.51%	30.39%	38.26%	3.60%	309.952
ZS	Zscaler Inc	17.8B	74.10X	11.17X	50.92X	29.76%	37.35%	10.23%	21.20%	125.45%	45.78%	430.02
CHKP	Check Point Software Tech	16.8B	12.49X	5.67X	11.36X	4.97%	4.51%	48.42%	54.83%	5.64%	7.99%	41.3
PLTR	Palantir Technologies Inc	14.6B	29.70X	6.37X	38.83X	22.11%	21.90%	30.71%	20.83%	-74.47%	-5.11%	778.215
OKTA	Okta Inc	10.9B	384.13X	5.78X	198.42X	17.78%	-227.38%	-5.67%	6.72%	-78.40%	2.82%	565.48
CYBR	Cyberark Software Ltd	5.4B	-537.23X	8.05X	177.60X	21.36%	-103.19%	4.75%	13.09%	-37.66%	1.12%	95.436
YOU	Clear Secure Inc	4.5B	203.58X	9.41X	7.14X	28.71%	-81.26%	-31.35%	16.04%	-119.67%	12.18%	36.511
TENB	Tenable Holdings Inc	4.3B	50.63X	6.05X	39.64X	20.31%	47.28%	9.42%	16.67%	3.87%	1.87%	79.405
KNBE	Knowbe4 Inc	4.4B	70.38X	12.04X	51.51X	24.58%	34.94%	11.54%	28.93%	187.50%	36.75%	29.345
QLYS	Qualys Inc	4.3B	17.89X	7.94X	22.18X	15.91%	9.48%	39.38%	42.85%	24.05%	1.11%	67.579
S	SentinelOne Inc	4.1B	-17.17X	8.03X	-17.88X	54.46%	-25.47%	-85.25%	-51.70%	-4.13%	110.65%	87.889
VRNS	Varonis Systems Inc	2.6B	55.00X	4.47X	335.19X	11.68%	19.08%	6.47%	-0.85%	-12.50%	-3.44%	109.779
NTCT	NetScout Systems, Inc.	2.4B	10.57X	2.47X	13.97X	1.97%	4.27%	21.04%	33.38%	13.31%	6.62%	56.074
BB	BlackBerry Ltd	2.5B	-26.03X	3.29X	-65.42X	9.78%	-48.46%	-9.61%	-9.33%	83.33%	-1.22%	30
RPD	Rapid7 Inc	2.2B	59.61X	4.13X	71.44X	16.76%	94.72%	1.42%	6.55%	73.08%	-0.83%	102.579
FORG	ForgeRock Inc	2.0B	-61.85X	8.01X	-42.87X	23.52%	-64.77%	-10.05%	-21.42%	-66.14%	23.00%	10.666
RDWR	Radware Ltd	0.9B	17.77X	1.77X	10.20X	3.45%	0.78%	13.57%	23.10%	-14.38%	2.82%	17.574
AVPT	AvePoint Inc	0.8B	-15.76X	2.63X	332.00X	18.76%	-331.09%	3.14%	2.62%	-104.44%	19.00%	59.508
SCWX	Secureworks Corp	0.5B	-5.99X	0.83X	20.44X	-5.56%	10.11%	1.54%	1.63%	-0.61%	-14.69%	30.446

Management Commentary

Palo Alto (PANW) on the rapid growth of NGS and SASE…. "Well, NGS is the collection of all the new capabilities that either protect the cloud or are delivered to the cloud. So every time we sell cloud security to a customer, which is deploying it over GCP, Azure. It goes into NGS. The Dodin deal goes into NGS when you protect them using expands. Any Cortex XDR deals goes into NGS. As we upgrade our firewall subscriptions where we can do real-time URL protection or we can do real-time DNS security, it is delivered using the public cloud. It goes into NGS. So all these things, we're trying to refactor our entire business to become a subscription business and get delivered from the cloud. So a lot of it is new growth, some of it is replacement demand, which is coming through people transitioning from on-prem capability to cloud delivered capability. True SASE competes are only happening with 2.5 vendors in the market. One, that's been around for a very long time. One, which is kind of in private mode and one is us. When we started the journey about 3 years ago when we actually had a real product in the market. We had to convince customers that we have a real SASE product. And the easiest customers to convince are your existing customers because they have experienced your capabilities, your services, some -- there's a contiguous nature of services that work on our firewalls that work in SASE."

Fortinet (FTNT) on security landscape and Firewalls…. "So I think with that sort of diverse threats, like the landscape and the -- it's also the ever-expanding threat surface that a lot of the enterprise customers today as they used to have on-prem network, but now they're expanding to the cloud. Also, there's kind of IoT devices. You may not know this. And also in the OT world, a lot of the manufacturing and oil, gas, they have a lot of these devices traditionally mechanical, but they're all controlled by computer. So it's ever increasing threat landscape in the tech surface. So all these needs some kind of effective protection. So I think for us, we -- from day 1, when we started the company, we realized at that time, if you go back 23 years, the firewall company at that time focused mostly on safety inspection when the content payload starts to carry attacks, they say, okay, it's not my problem, right? I have my firewall. But at Fortinet, we started off by saying we are a cybersecurity company. And if the threat changes, we're going to evolve our technology to stop that. So we started out by -- we're the first one who came out with the UTM firewall, the next-gen firewall. And then gradually, as the attack surface extends to the cloud, to the OT, we just basically expanded the portfolio to cover. So for example, for the last 5 to 10 years, a significant driver was SD-WAN, a lot of customers, they started to have branch offices, they build up the overlay between the branch and HQ. So we evolve the technology, and SD-WAN is part of our standard offerings. And Gartner also recognized that by putting us into the Leaders Quadrant for SD-WAN as well as the network firewall. So I mean, moving forward, we're also seeing lot of the advanced threats like APT, we call it advanced persistent threat, APT. So there's different technology on that as well which requires newer platform-based defense mechanism, like zero trust technologies, and like OT would bring a total different aspect of those challenges to us."

Okta (OKTA) on the opportunity ahead…. "So when we look at our opportunity, what could accelerate us and what could make us go faster. And this is how we think about that. So we have a massive addressable market, $80 billion. We've talked about that a lot. And we're just getting started. We're -- this year, we're going to be about $1.8 billion into that. And what are the opportunities? How can we accelerate things, go faster? What is happening around us that can unlock this massive opportunity even further. Well, one important distinction is that I talk a lot about how the cloud has been the evolution of the cloud has helped us be more successful because when more apps are in the cloud, it heightens the security requirements. People can use the cloud to transform digitally. But there's also -- when you look at Okta, there's the fact that it is a cloud service itself. And that is a very differentiating for us. So the dynamics aren't exactly the same. It's a different market, a different set of requirements. But you could argue that using a security tool and an Identity tool, the move and the tip to the cloud for that installation might be even more than accelerate because it's such an impactful thing that once people make the flip and start seeing the value of it, it could accelerate things even faster. So this is exciting for the workforce side. But on the customer Identity side, it's a little bit of a different story."

OptionsHawk Executive Summary & Focus Stocks

Check Point (CHKP) does not have the attractive growth profile as the others but is an FCF machine and trades super cheap at 11X FCF, a value buy type. **Palantir (PLTR)** remains garbage. Of the big four **Palo Alto (PANW)** remains the preferred name as a balance of strong growth with profitability and cheaper valuation. **Zscaler (ZS)** and **CrowdStrike (CRWD)** are excellent growth stories, but both still need to see valuations come in though strong metrics make them worthwhile plays in the right environment as best-in-class names. **Qualys (QLYS)** continues to screen well as cheap at 22X FCF with strong growth and impressive margins while **Tenable (TENB)** a likely M&A target as is **Rapid7 (RPD)**. **NetScout (NTCT)** is a value play at 10.5X EBITDA and 14X FCF but with a much lower growth rate and strong margins, but hard to justify as the best value name with CHKP better across most metrics.

IT Services – Healthcare IT Services

Components: HQY, RCM, DOCS, PINC, EVH, GDRX, MDRX, MPLN, SDGR, NXGN, DH, HSTM, ACCD, CPSI, HCAT, SMFR, QSI, OPRX

International & Private Peers

Intro

This group is a diverse set of companies with one thing in common, applying Technology to the Healthcare sector. The largest names in this group are Cerner (CERN) which was acquired by Oracle, Premier (PINC), OptimizeRx (OPRX) and Evolent (EVH) which is focused on electronic medical records and supply chain & performance services, GoodRx (GDRX), HealthEquity (HQY), Accolade (ACCD) as a consumer-facing digital healthcare platforms that primarily provides prescription savings, subscription packages, engagement services and telehealth services to consumers in the US, and Doximity (DOCS) which is an online professional network for physicians that primarily monetizes through advertising by pharmaceutical manufacturers and health systems, as well as through medical staffing and telehealth offerings. There are also software-based plays like Certara (CERT), Schrodinger (SDGR), Quantum-Si (QSI) with biosimulation and drug discovery, healthcare data intelligence with Definitive Health (DH) & Health Catalyst (HCAT), healthcare practice management software like R1 (RCM), Allscripts (MDRX), Nextgen (NXGN), and HealthStream (HSTM).

Segment	Description	Est Company Rev Growth	Competitors	Est TAM $Bns
EMR/EHR: Electronic Medical or Health Record Companies	Includes digitizing healthcare records and allow for other patient scheduling, contact and sometimes other functionality like billing.	2-8%	CERN, MDRX, EPIC, SHCR, McKesson and more	$ 25
RCM: Revenue Cycle Management Companies	Involves more sophisticated revenue cycle management functionality, billing, collection, proper CPT Coding, tracking, and more.	8-16%	R1RCM, Ensemble, MDRX, CERN, HCAT and more	$ 60
Artificial Intelligence & Advanced Analytics, Software-Based Platforms as relates to Healthcare & Life Sciences	Uses artificial intelligence, machine learning or advanced analytics for predictive and/or other analytical purposes in order to benchmark clinical and/or financial performance, create new diagnostics and or treatment therapies.	10-20+%	HCAT, ADPT, MDRX, Strata Decision Technology, Oracle, IBM, Cognizant, AthenaHealth, CNVY and more	$ 75
Digital Health Care Content & Marketing	Works with healthcare information to create digital healthcare content, apps, or other information that is typically distributed across a network and supported by an advertising or subscription	10-50%	SHCR, DOCS, Redline Ventures and more	$ 230
Total & In-Home Care	Involves more comprehensive digital offerings that include some combination of telehealth, virtual primary care, mental/behavioral health, second opinions, and/or in-home clinical care.	20-35+%	TDOC, AMWL, SGFY, ACCD, Included Health and more	$ 400
	Estimated Ranges & Total	2-50%		$ 790

M&A has been an active theme in the group through 2022 with multiple deals announced. To penetrate the healthcare market more effectively, tech companies are utilizing M&A such as the Oracle/Cerner, Microsoft/Nuance and Amazon/One Medical deals. Elongated selling cycles call into question how defensive the Healthcare market really is for new business models. Companies have started to better manage expenses and focus on profitability with a tougher Macro environment.

Industry Backdrop & Investment Considerations

Healthcare IT (HCIT) spending is the key driver across the group and the goal of these companies is to reshape the healthcare system utilizing technology solutions. The US Healthcare system has $3.6 trillion in annual spend with $935B in wasteful spend. The TAM for Health Tech is estimated around $400B. The healthcare sector is among the lowest-digitized sectors and is slow to adopt changes.

This group captures several technology trends disrupting the massive Healthcare sector including Telemedicine, Electronic Health Records, Prescription Drug Platforms, Payments and Cost Management, Digital Health Membership, Automation in Healthcare, Drug Discovery Software, Communications, and Analytics. Health tech is at the intersection of healthcare and technology, and health tech companies utilize various technologies (software, hardware, and tech-enabled services) to make improvements within the healthcare system. Health tech is at the intersection of healthcare and technology, and health tech companies utilize various technologies (software, hardware, and tech-enabled services) to make improvements within the healthcare system. Solutions can be broadly grouped by end-markets – payers, providers, life sciences, and employers.

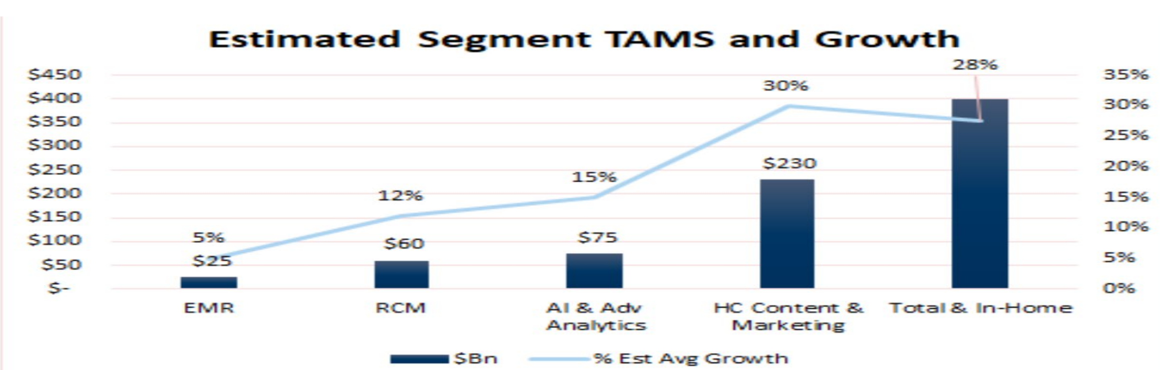
There are several themes developing across the massive Healthcare industry to drive future growth and none as large as the shift to value-based care. Healthcare IT spending will grow by 6.8% in 2021 to reach $140B. Both health consumption and investment in research and equipment have been growing, with health consumption growing at about twice the rate of investment.

The U.S. healthcare system is costly and inefficient. A Journal of American Medical Association (JAMA) publication suggests that roughly 30% of the $3.6 trillion annual healthcare spend goes to waste, about $935bn each year. The JAMA study grouped wasteful spend into six categories: administrative complexity (31%), pricing failure (28%), failure of care delivery (16%), overtreatment of low-value care (10%), fraud and abuse (8%), and failure of care coordination (6%).

The medical community is now faced with the prospect of a growing, aging population with a compromised healthcare infrastucture as the industry transitions from a hospital-centric model to more outpatient, virtual, and in-home services, and from pay-for-service to value-based care initiatives. Healthcare technology solutions can help physicians navigate these growing realities. Technology is advancing at a fast pace, and business models abound. Those businesses that provide a real solution to pressing problems, such as addressing mental health, chronic conditions, or allow for alternative venues (in-home care) or more innovative treatments (derived from predictive analytics or other technology) that can drive better patient outcomes are particularly attractive.

Indicators, Metrics & Stock Selection Framework

EV/Sales; EV/EBITDA;



Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change	SBC
Digital Health Services						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
DOCS	Doximity Inc	6.7B	32.50X	13.92X	40.69X	22.49%	23.64%	42.58%	35.19%	-9.21%	26.15%	31.442
HQY	Healthequity Inc	5.2B	22.20X	6.95X	64.53X	12.14%	31.12%	24.82%	0.52%	0.00%	13.32%	53.092
RCM	R1 RCM Holdco Inc	4.6B	14.77X	3.47X	19.84X	28.62%	128.73%	12.55%	14.45%	-123.26%	6.26%	74.3
PINC	Premier Inc	4.0B	8.37X	3.08X	15.06X	7.11%	14.41%	28.86%	24.90%	4.76%	-0.80%	46.229
EVH	Evolent Health Inc	2.8B	30.30X	2.28X		24.99%	61.33%	2.95%	1.52%	633.33%	15.25%	16.711
MDRX	Allscripts Healthcare Soluti	2.0B	9.95X	2.75X		6.78%	12.27%	11.40%	-10.25%	-15.84%	-59.68%	43.563
GDRX	Goodrx Holdings Inc	2.1B	9.74X	2.62X	20.95X	2.93%	-5.13%	28.63%	19.36%	-33.17%	-17.18%	160.462
SDGR	Schrodinger Inc	1.4B	-5.98X	5.48X	-9.67X	55.00%	-24.11%	-80.80%	-56.43%	9.20%	-0.11%	3.858
NXGN	Nextgen Healthcare Inc	1.3B	10.96X	1.91X	26.93X	7.14%	10.61%	14.13%	4.27%	-1.01%	7.28%	26.552
DH	Definitive Healthcare Corp	1.9B	36.67X	10.52X	57.36X	15.60%	11.45%	16.97%	11.12%	85.84%	34.15%	9.957
MPLN	Multiplan Corp	1.0B	7.10X	5.06X		-5.38%	-6.70%	34.55%	28.64%	-45.24%	-2.68%	18.01
HSTM	HealthStream, Inc.	0.7B	13.28X	2.62X		6.59%	17.59%	3.14%	6.64%	68.18%	3.80%	5.303
ACCD	Accolade Inc	0.6B	-14.72X	1.54X	-0.33X	12.92%	-61.11%	-40.55%	-21.28%	208.53%	17.34%	72.939
HCAT	Health Catalyst Inc	0.6B	-127.36X	1.54X	-13.30X	8.31%	4.77%	-10.62%	-17.19%	-16.22%	-5.26%	65.145
CPSI	Computer Programs & Syst	0.4B	9.22X	1.60X		5.73%	-40.23%	15.98%	13.35%	-5.01%	4.47%	5.457
QSI	Quantum-Si Inc	0.3B	0.68X	-52.15X		#VALUE!	21.40%	#VALUE!	#VALUE!	10.23%	#VALUE!	24.918
OPRX	OptimizeRx Corporation	0.3B	35.93X	3.43X		20.79%	-141.07%	12.95%	0.43%	-50.00%	-22.12%	5.491957
SMFR	Sema4 Holdings Corp	0.1B	0.08X	-0.10X		-10.82%	-53.97%	-210.25%	-99.54%	-6.82%	-10.09%	219.421

Management Commentary

Doximity (DOCS) on digital marketing across healthcare…. “Okay. I'd like to take a few minutes now to discuss the post-pandemic shift to digital marketing and how this affects our long-term growth rates. As a reminder, our clients include all of the top 20 hospitals and all of the top 20 pharmaceutical companies, a distinction we believe no other digital health company shares. Hospitals have surprisingly been our fastest-growing clients this year. They've accelerated their shift to digital out of necessity. Cost and Hall predicts that half of U.S. hospitals will lose money this year, and there's a painful and growing divide between the digital haves and the digital have-nots. As for pharma digital marketing, a few analysts have predicted a flat year as pharma returns to its pre-pandemic ways. We believe this is overblown. While we hit an air pocket early this year, we've since seen a steady rebound in the market as pharma migrates traditional dollars to digital. A number of credible sources agree with us here. For starters, this August, eMarketer estimated that digital B2B health care marketing, our core market, grew 46% in 2020, 30% in 2021, and will grow 17% in 2022. We think this sounds about right. Pharma is known to be recession-resistant, and the latest Standard Media Index report supports this. Our clients are resilient and profitable, and we continue to benefit from multiyear tailwinds in our industry's nascent and overdue shift to digital. Our ROI-driven pricing model aligns us with our clients, making us their digital HCP partner. And as our physician platform continues to set usage records, we're excited by a generational opportunity to create a win-win digital platform to connect physicians across the greater health care ecosystem.”

Health Equity (HQY) on custodial growth…. “Despite volatile market conditions, HSA invested assets grew $111 million in the quarter, HSA investing members grew 28% and the average balance of our HSA members overall grew 5% year-over-year. Custodial revenue growth was very strong. On top of the small favorable impact of in-quarter increases in the overnight Fed funds rate, robust adoption by HSA members of HealthEquity's enhanced rates offering in Q2, puts us on track to meet or exceed our target of having 20% of HSA cash in enhanced rates by the end of the fiscal year. Both macro conditions and the team's efforts are, we believe, creating the opportunity for years of custodial growth to come. Robust card fee growth suggests that inflationary pressures in the broader economy have not put a dent in consumption of medical and other coverage services by consumers to date.”

OptionsHawk Executive Summary & Focus Stocks

There are some attractive names in this group led by **Doximity (DOCS)** which trades a bit rich at 32X EBITDA and 40X FCF but offers amazing growth and strong margins, a riskier top pick. **RCM (RCM)** and **Premier (PINC)** are both too cheap and could attract takeout bids. **Health Equity (HQY)** has quietly been a big beneficiary of higher rates and continues to screen as an attractive growth own. In the smaller names **Evolent (EVH)** screens healthy as a fast grower though at a premium valuation while **Nexgen (NXGN)** screens cheap with solid, not exemplary, growth. The sub $1B market cap group is very messy on financials and do not see any great opportunities though **HealthStream (HSTM)** is cheap with solid financials as a M&A play.

Tech Equipment – PC Hardware

Components: IBM, CAJ, HPQ, DELL, LOGI, DLB, LPL, XMTR, CRSR, KRNT, IONQ, DDD, SSYS, DM, VLD, NNDM, PRLB, ARLO, MKFG, FATH, DAKT, HEAR, SMCI

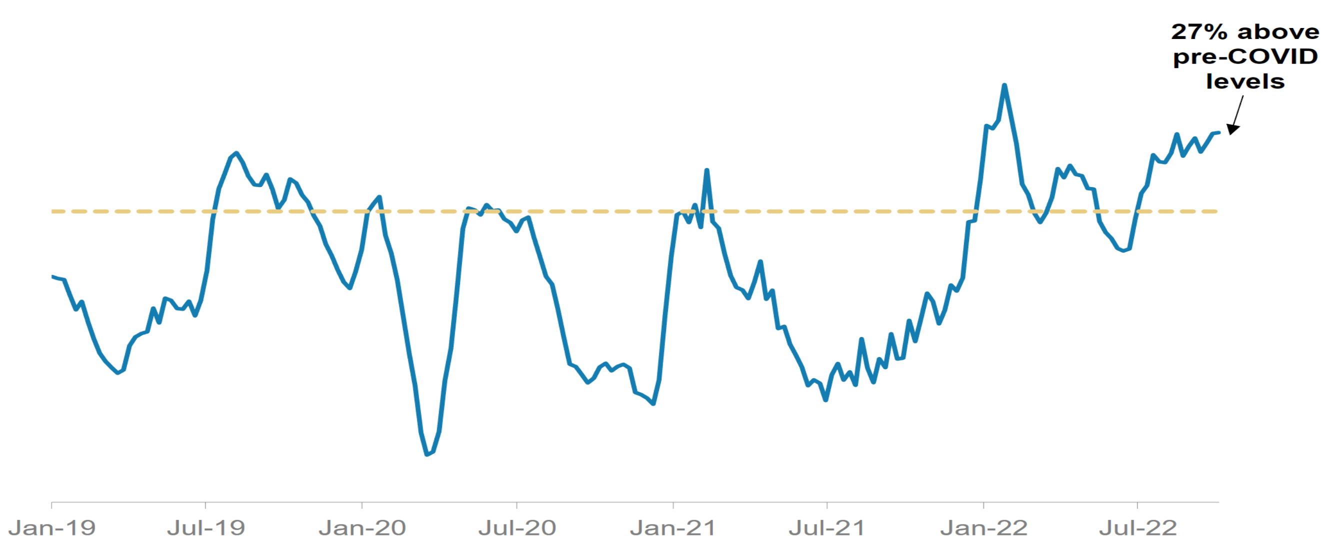
International & Private Peers: LG Electronics, Hikvision, Sony

Intro

This group mostly consists of the PC-related hardware makers (IBM, DELL, HPQ, CAJ, LOGI, DLB, LPL, CRSR, HEAR) and the Additive Manufacturing plays (DDD, SSYS, XMTR, PRLB, NNDM, MKFG).

Hardware Is seeing incrementally deteriorating consumer electronics and PC demand coming off a COVID-driven high. Macro uncertainty and the rising risk of a recession are driving enterprise hardware budget cuts and lengthening sales cycles while elevated inventories and a strong USD are also headwinds. CIOs expect decelerating Server, Storage, PC and Peripherals spend in 2023 and carry the most risk of additional budget cuts in a worsening economy. Even commentary from companies selling into cloud data centers has turned more cautious in recent weeks. For PC and peripherals, the worsening of demand is due to a combination of enterprise cost cuts, reduced work-from-home/hybrid work demand, and order pull forward from 2020-1H22 which has caused a spike in channel inventories. IBM has been a top Tech performer in 2022 as it continues to transition to Software growth but also shows its late cycle defensibility due to its 50%+ recurring revenue mix having less earnings risk. LOGI believes that work, learn, and play from home + video everywhere + the growth of gaming will remain secular trends persisting over the long-term. HPQ has greater exposure to the consumer + education than commercial so PC demand weakness will manifest in slowing topline growth. The digital manufacturing companies are facing ongoing macro pressures from higher inflation and supply chain issues as well as a slowing demand backdrop.

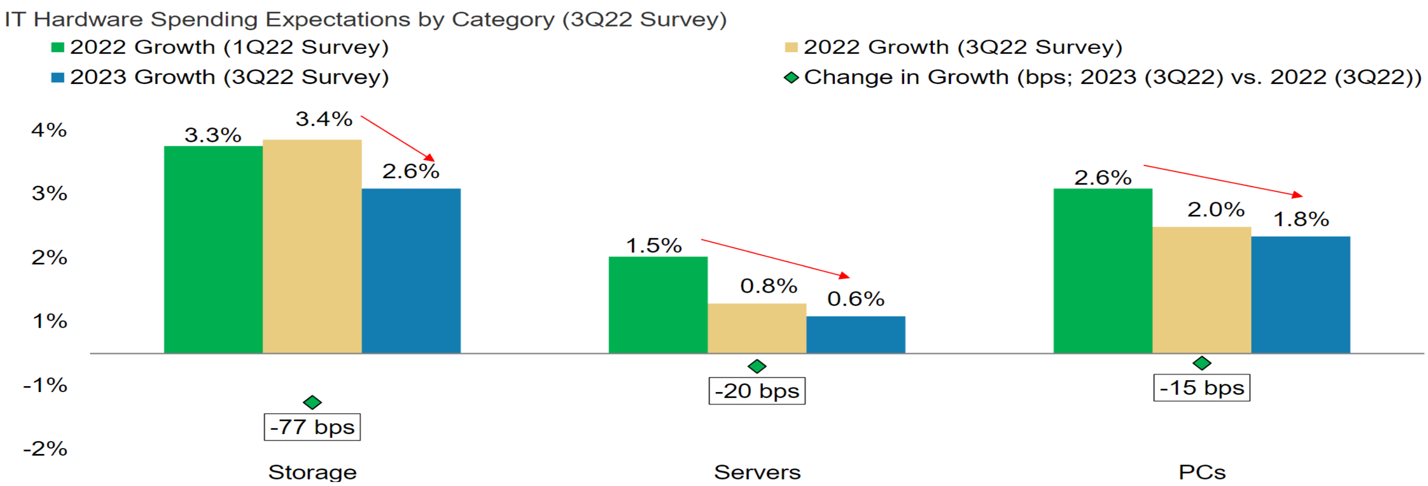
Traditional PC Channel Inventory



Industry Backdrop & Investment Considerations

The PC Gaming Hardware market is seeing strong growth and around a $40B market while Peripherals a market seen reaching $7B by 2025 at a 10.4% CAGR. The global gaming PC and streaming gear markets, including peripherals, components and prebuilt PCs and laptops specifically designed for PC gaming. The gaming accesory market is estimated at $5.2B. Gaming continues to capture a growing share of entertainment and leisure spend.

The 3D Printing and Additive Manufacturing market generated $12B in revenues in 2020 and seen reaching $78B by 2028, a CAGR of 26-32%. Industry 4.0 is a rising trend that is anticipated to shift the global market dynamics and bring a radical change to manufacturing processes. Leading companies are making use of 3D printing as a means of technology to create complex designs that are designed as per client requirements therefore imbibing a smart industrial revolution. The testing of theoretical designs before setting up production lines is expected to change the process of product development in the coming years. Global Manufacturing addresses a $260B market across CNC manufacturing, sheet metal manufacturing, 3D printing, die casting, injection molding, and urethane casting.



Indicators, Metrics & Stock Selection Framework

Revenue Growth, EBITDA Growth, EBITDA Margins, EV/Sales, EV/EBITDA

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
PC Hardware						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
IBM	International Business Machines Corp.	128.7B	11.51X	2.82X	18.85X	0.51%	13.83%	15.26%	17.49%	-7.68%	-0.87%
CAJ	Canon Inc (ADR)	30.0B	7.09X	1.07X	23.65X	2.38%	#VALUE!	8.63%	7.79%	23.34%	12.64%
DELL	Dell Technologies Inc	29.1B	4.92X	0.51X	9.22X	-9.36%	-16.20%	7.69%	7.42%	13.20%	-3.88%
HPQ	HP Inc	26.4B	6.49X	0.60X		2.04%	5.54%	8.70%	5.83%	-4.74%	-4.49%
LOGI	Logitech International SA (USA)	10.1B	12.69X	1.92X	19.68X	4.76%	14.71%	16.50%	3.82%	-20.54%	-11.83%
DLB	Dolby Laboratories Inc	6.8B	12.97X	4.71X		5.94%	12.03%	29.96%	20.67%	-12.80%	-6.86%
SMCI	Super Micro Computer, Inc.	4.3B	7.20X	0.62X		7.09%	-6.81%	7.21%	-9.35%	210.08%	52.55%
LPL	LG Display Co Ltd (ADR)	3.8B	10075.87X	1099.77X		-2.04%	-65.53%	7.47%	6.61%	-290.18%	-9.66%
CRSR	Corsair Gaming Inc	1.5B	44.96X	1.30X	38.42X	15.04%	327.48%	9.72%	0.48%	-89.56%	-27.95%
XMTR	Xometry Inc	1.6B	-42.64X	4.04X	-23.44X	33.62%	-54.30%	-23.24%	-34.27%	-20.62%	-2.02%
KRNT	Kornit Digital Ltd	1.1B	-17.40X	1.58X	-8.17X	0.78%	-117.29%	17.30%	12.12%	-171.26%	-15.32%
DDD	3D Systems Corp	1.1B	-152.00X	1.72X	50.91X	4.40%	-31.88%	8.09%	4.77%	-382.22%	-10.05%
IONQ	IONQ Inc	0.8B	-6.49X	38.61X	-7.28X	102.67%	44.59%	-1843.12%	-1664.60%	-54.24%	0.69%
SSYS	Stratasys Ltd	0.8B	12.14X	0.66X	-256.73X	0.94%	73.62%	-0.28%	1.49%	-38.24%	-5.19%

Management Commentary

IBM (IBM) on AI investments…. “We decided to focus our AI investment in 3 big areas, which I think are broadly applicable for enterprise technology. One is natural language because business is all about language, documents, understanding. Two is automation, whether it's automating IT processes or business processes. And third is trusted AI, which I think we're still early on. But as companies get more AI models into production, how you understand how decisions are being made, bias detection, drift detection, those become very important capabilities. So that's where we've invested in core R&D, I would say, over the last couple of years for AI. What does that mean for clients? There's 5 use cases that I see gaining a lot of momentum for AI. One is customer service. IT operations. Instead of having to hire a bunch of people to manage your systems, can you use software to do part of that work? Understanding potential defects, improving mean time to resolution when you have an issue. So IT operations is the second. Third is cybersecurity. And I think the line between AI and cyber is actually blurring, and there's so much happening in cyber. The only way to keep up is through software, not through throwing more humans at it. So that's happening. Sustainability is a fourth area. Understanding data sets, how does that fit into reducing energy costs, energy consumption as an example. And last, I would say, serving employees. I think the best example of that is what we implemented in IBM, which is we're using AI now. It's kind of an interface across all of our HR systems. So employees don't even know what system they're using. They just get a simple, natural language query box. They can ask questions, they can get answers.”

Dell (DELL) on PC markets…. “Let's just stay with IDC data, so we all have a common currency. If you look at a commercial unit on an ASP basis versus a chrome unit, it's 3.5x more valuable on an ASP basis. If you look at a high price band consumer unit, versus a mainstream consumer unit on an ASP basis, it's 2.5x more valuable and chrome and mainstream consumer have been the most elastic up and down in this market. And so for us in our business that is principally centered on the commercial PC business, I think it's helpful to look at units of commercial, excluding chrome and revenue as well. And I think when you unpack that, you're going to see the profound change in usage that we've seen. That profound change in usage is hybrid work. 75% of companies are now in a hybrid model. They -- that means more notebooks with a faster refresh cycle. It also means richer configurations, more peripherals. It is not just a productivity device. It is our telephony. It is our video conferencing equipment. And what we hear from customers time and time again is this matters to our employees now. And so we continue to hear it's a CIO level issue, and they're going to continue to invest in the end user experience. o there's a lot of reasons to be bullish about that market. If you pull back to the data again, say in IDC, their latest 2023 forecast, you will see that market, the total market up 2019 to 2023, 5% on a unit basis and 15% on a revenue basis. That's the change in usage. That's more commercial units, that's richer configurations. That's what we believe is going to happen. So despite the caution and pause right now, we're very bullish on the PC -- commercial PC market long term.”

Xometry (XMTR) on its marketplace….. “Use of our manufacturing marketplace is increasing. Our AI pricing engine and matching algorithms are responding quickly to changing market conditions, delivering better value for our customers and consequently increasing order frequency. We saw a step change in supplier activity as they are increasingly attracted to our marketplace as it provides them with access to a rapidly growing base of buyers and orders. While we've observed lower job costs in recent weeks, we can optimize our pricing while maintaining strong order growth and conversions through changes in our algorithms. We expect the combination of pricing optimization and higher order frequency will grow our revenue per buyer in early 2023, enabling us to deliver robust marketplace growth. Additionally, we expect Marketplace gross margin to continue to expand in 2023, driving robust gross profit growth as well. Our TAM is over $2 trillion in the massive $35 trillion global manufacturing industry. We will continue to invest to further capitalize on our position as the leading 2-sided marketplace. In 2020, our revenue was $141 million. In 2022, we expect that to nearly triple. At the same time, we expect gross profit dollars to grow over fourfold with significant gross margin expansion."

OptionsHawk Executive Summary & Focus Stocks

None of the large cap names here are favorites by any means with very modest growth and the weak PC cycle but that cycle can bottom and there will be value buys, **HP (HPQ)** stands out at 6.5X EBITDA with estimates holding up the best of the names. **Canon (CAJ)** also looks cheap and is seeing strong upward revisions, an often-overlooked name. Earnings headwinds are likely to remain for many of the other names, but **Super Micro (SMCI)** a top 2022 pick was a standout and continues to beat and raise quarterly while trading just 7X EBITDA, a phenomenal success story with no signs of momentum slowing albeit operating at low margins. None of the names with market caps under $2B look attractive and likely a lot of zeros.

Tech Equipment – Storage

Components: MU, NTAP, WDC, STX, PSTG, SIMO, SGH, TDC

International & Private Peers: Samsung, Hynix, Hitachi, Huawei

Intro

The storage markets primarily consist of the traditional hard-drive market, DRAM/Flash Memory markets, and the newer Cloud Storage markets. Direct-Attached Storage, Network-Attached Storage, and Storage Area Network are a few of the key segments for next generation storage.

Demand for hard drives from the PC market is weak as OEMs reduce inventory. NAND demand from smartphones is also weak. NAND supply/demand remains unbalanced which is resulting in weak NAND pricing. China continues to be weak (enterprise, cloud, smart video), while U.S. hyperscale is also turning cautious. WD sees HDD pricing gradually improving on introduction of higher density storage drives (greater TCO benefits) but expects Flash pricing to remain pressured in the near-term given weaker NAND demand. STX management commented that the macro environment deteriorated throughout the Sept Q due to an economic slowdown in China, weakening consumer spending, and elevated inventory at customers, which led to a second round of production cuts towards the end of September.

TDC is a cloud transition story and is actively launching new products. PSTG has seen strong uptake of its new products and also seeing a positive mix-shift to higher margin software revenues. NTAP saw slower growth in cloud storage services as customers were more cautious on spending which is consistent with other industry read-throughs on slowing enterprise demand.

Industry Backdrop & Investment Considerations

The global cloud storage market is expected to grow to $137B in 2025 from $50B in 2020, a 22% CAGR. Next-generation storage is being driven by growth in IoT, a rise in adoption of cloud computing, and escalated use of devices across most industry verticals. The next-generation storage market was valued at $24B in 2019 and is expected to reach a value of $45.5B by 2025, registering a CAGR of 11.4%. Rising penetration of the Internet, growing e-commerce industry, digitization of day-to-day activities, and increasing volume of media data transfer are expected to increase market penetration of solid-state drives and cloud solutions. Storage area network is expected to hold the largest share of the next-generation data storage market during 2020–2025. As an increasing number of companies have started utilizing cloud-based services to store their data with the use of virtual servers, companies aim to expand their storage capacities beyond existing infrastructural capabilities. SAN technology is widely used by cloud technology creators due to its ability to connect large numbers of servers to storage devices.

Flash storage has performed better than other areas for mission critical workloads. The next-generation data storage market is expected to grow at a CAGR of 10.1% from 2020 to 2027 to reach $56.7B by 2027. The market is driven by factors such as the explosive growth in digital data, the proliferation of IoT and connected devices, and the increasing adoption of high-end cloud computing solutions. By type, the next-generation data storage market is segmented into Direct-attached Storage (DAS), Network-attached Storage (NAS), and Storage Area Networks (SAN). By medium, the next-generation data storage market is segmented into Hard Disk Drives (HDD), Solid-state Drives (SSD), and magnetic tape.

Pure Storage (PSTG) recently outlined a $60B+ TAM at its Analyst Day with a 14% CAGR through 2024 in some notable growth areas across Data Management Software/Services & Storage Infrastructure. The growth opportunity revolves around modernizing operations, applications and infrastructure.

Another trend in storage to watch is the SSD to HDD economics nearing an inflection point. The SSD segment is expected to grow at the highest CAGR. This rise is attributed to the SSDs' faster reading and writing speeds.

In Memory Tech investor concerns into 2023 are on high inventories, capex increase, muted demand growth, and price cut pressures.

Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, EBIT Margins, EV/Sales, ROE

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Storage						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
MU	Micron Technology, Inc.	56.8B	7.94X	3.03X	-50.02X	40.03%	1723.52%	33.43%	10.12%	-98.80%	-48.15%
NTAP	NetApp Inc.	13.2B	7.30X	1.93X	11.01X	3.06%	6.70%	23.68%	15.59%	5.16%	2.96%
STX	Seagate Technology Holdings PLC	10.8B	13.23X	2.06X	22.43X	17.46%	101.08%	18.37%	10.94%	-79.73%	-34.87%
WDC	Western Digital Corp	10.2B	11.78X	1.15X	-11.86X	19.16%	352.66%	16.95%	4.03%	-99.69%	-29.05%
PSTG	Pure Storage Inc	8.8B	15.14X	2.88X	18.42X	14.02%	6.72%	10.78%	14.12%	101.59%	30.95%
TDC	Teradata Corporation	3.4B	9.41X	1.96X	9.06X	1.38%	8.91%	20.50%	22.54%	-14.89%	-7.75%
SIMO	Silicon Motion Technology Corp. (ADR)	2.2B	7.33X	1.95X	10.47X	0.32%	-6.50%	29.22%	16.27%	9.87%	8.20%
SGH	SMART Global Holdings Inc.	0.8B	5.30X	0.59X	7.98X	8.93%	17.08%	12.51%	3.67%	-32.14%	-2.93%

Management Commentary

Micron (MU) on the cyclical downturn…. “So I think I'd just like to end opening comments with, we're in a cycle downturn, a cyclical downturn, we're managing it aggressively working to get supply/demand in balance. And -- but as we look out longer term, and we think through cycle, we're really excited about the market. The world is going to need more memory and storage. There's very strong secular growth drivers that we all know, data center, automotive, 5G, and so there's -- artificial intelligence, that's going to drive products and technology, the space will grow. And then Micron is in a great position. We've got a strong balance sheet to weather this downturn. We're leaders in technology. We've got the best set of products in this space, and we're manufacturing just outstanding manufacturing excellence at this time.”

Western Digital (WDC) on HDD/SSD…. “These days, when you go buy a PC, laptop, you buy only solid state drives. There's a very, very small percentage of hard drive still sold. So people think in this replace mentality mostly. Let me give you the statistic. In 2021, last year, in data center storage, the mix was 88% HDD, 12% SSD. The projection for 2026 today, 5 years from the 2021 bid, is 83% HDD, 17% SSD. So it is not like flash is not growing. The overall TAM is growing and flash percentage is growing, but HDDs also growing. So the difference in cost, especially when the large capacity enterprise. So today, for example, our leading products in hard drive are 22 and 26 terabyte drives. In that kind of densities, the cost difference is still almost 8x to 9x. And to replace that kind of volume is going to take a long time. So in my mind, these are 2 parallel lines. They're going to stay parallel for at least through the end of this decade. Then it's going to be about flash. Clearly, there's -- but you're going from 11% to 12% to 17% to 19%. You are not becoming 70%, 80%. It will grow. Because both are going down in cost and capacity is growing, overall data needs are growing. So SSD will remain mostly in fast applications, HDD will always in colder large data applications."

Pure Storage (PSTG) on Meta deployment…. "So a bit of a description of the Meta research supercluster environment. This is an engagement that goes back really over 5 years. We began working with the Facebook team at the time in one of their AI research environments, supplying them with FlashBlade arrays to do direct training to their NVIDIA GPUs. As that engagement became successful and that project on the AI research side grew within Facebook, they decided to really scale it up into production service. And we started working with them as they were spec-ing the infrastructure for that. And to the second part of your question, as they started looking at their needs for that production service, the couple attributes that became the most critical -- certainly, price and cost was always there. But performance, naturally. But space and power were very critical, right? They literally had data centers built out. They had power limitations. And fundamentally, they needed to get as much storage in there in the smallest amount of power envelope, so they could use their power budget for GPUs and processing, right? And so as that engagement has grown and what does it look like, so we still supply the direct training piece with FlashBlade. The larger part of that environment and footprint really though is served by FlashArray//C. And we think of that as -- and it's really being used as more of a bulk data storage environment, right? So think about in an AI training environment, as they're working those algorithms, the algorithms have to go work on large pools of data, whether it's images, video, text, so on and so forth. We're supplying the bulk storage of that training data on FlashArray//C."

OptionsHawk Executive Summary & Focus Stocks

The storage group is interesting with many names beaten up and now at cheap valuations while looking forward a new growth cycle set to emerge. **Micron (MU)** is still a concern as the memory cycle could see further pressure on pricing/demand. **Pure Storage (PSTG)** is certainly my favorite name with it delivering strong numbers in a tough backdrop due to key secular trends. **NetApp (NTAP)** still looks like a short as it faces pressures in cloud while **Seagate (STX)** would be the deep value buy of the group.

Tech Equipment – Networking Equipment

Components:

Enterprise: JNPR, CSCO, HPE, ANET, NOK, ERIC, ADTN, SCSC, CMBM, NTGR, CMTL

T&M, Industrial & Service Providers: CIEN, KEYS, NATI, COMM, INFN, LITE, VIAV, CASA, SPOK, UI, VRT, CALX, FN, EXTR, HLIT, CLFD, DGII, ATEN, AUDC, ITRN, RBBN, GILT

International & Private Peers: Ericsson, Foxconn, Nokia, ZTE

Intro

The main divisions in the Networking/Communications industry are Wireless, Wireline, Routing/Switching, Optical, and Voice/IMS. Fiber and 5G are expected to be strong growth themes moving forward. We can also break them down across core markets served such as Enterprise, Telecom, Test/Measurement and Industrial.

In networking, there will be a lag between when companies see the downturn in revenue given supply chain constraints. Data center investments were the primary driver of growth for resellers in Q3. Cloud initiatives and associated modernization projects have supported upgrade activity driving investment in higher-speed data center switches, multi-cloud management tools, security, and next-generation storage platforms. Service provider was also noted as an area of strength as customers are investing to keep up with Federal broadband initiatives. CIO expectations are starting to turn and checks are getting more negative. Valuations in networking tend to peak 3-6 months before CIO results begin to turn. 2023 cloud capex forecast points to 8% Y/Y growth ex-Amazon. Overall, the deceleration in cloud capex in 2023 suggests that hyperscalers may be entering a digestion period after 3 consecutive years of accelerating cloud capex growth.

Enterprise switching is posting strong growth with acceleration in both campus and data center switching related to hyperscaler deployment of data center switches. Cloud vertical growth is seen staying elevated in 2023, though moderating growth, and although demand could cool in 2023 with the economic cycle, the supply/demand situation coming back into balance could provide a lift to results. Enterprises are investing in their campus network after a few years of COVID-related pauses as well as increasing investments in network infrastructure to support the increase in the number of users and devices (including IoT), to provide greater bandwidth and low latencies.

The SP routing market is also showing strong growth attributed to growth in bandwidth demands, 5G-related projects, 400G deployments, and capacity additions of SPs in North America. Supply constraints and cloud deployments may keep the short-term trends positive, but the market is seen eventually returning to weak growth with deflationary pressures. The edge routing segment (~77% of total) has proven to be a better growth engine historically, supported by both bandwidth demands and new service offerings, while being offset by the proliferation of SD-WAN.

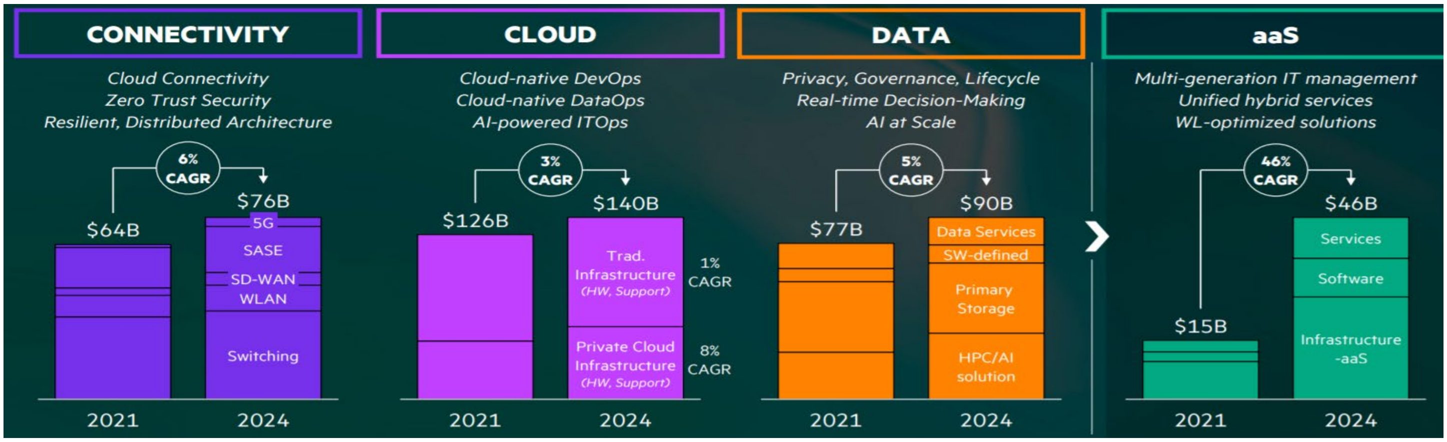
Service provider / test & measurement exposed names underlying demand conditions could remain steadier in a down macro cycle while Enterprise/Cloud spending cools. T&M is more defensive industry in down-cycles given exposures to lab spend as R&D spend is typically defensive against cycles given need for continued innovation and growth. 5G, EV/AV, A&D/Space remain key megatrends seeing investments. Furthermore, the CHIPS Act and increased onshoring efforts should serve as an incremental offset this cycle.

Industry Backdrop & Investment Considerations

According to Gartner, 5G wireless infrastructure revenue for Service Providers will grow to $11.1B in 2023 and represent 29% of total wireless infrastructure revenue for operators. 5G infrastructure spending is expected to reach $26B by 2022 (+165% CAGR), with the 5G RAN representing ~50% of total infrastructure spending by 2022. The base station equipment market for semiconductors and RF mobile phone market is expected to reach $4.7B and >$20B by 2022, respectively.

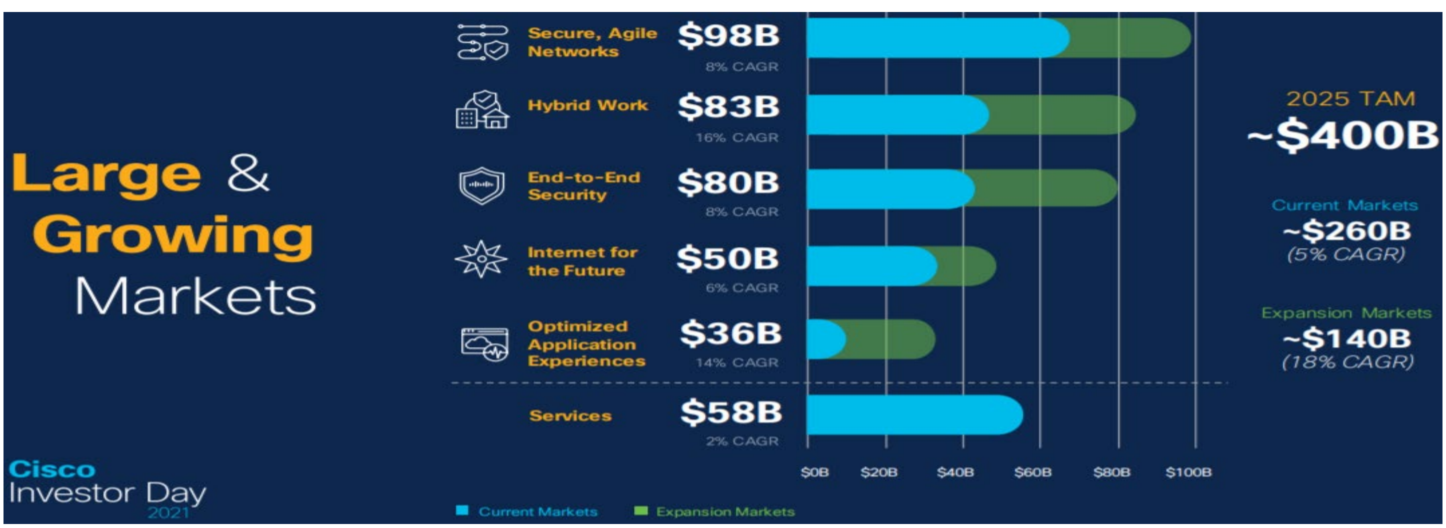
Emerging services and applications are further impacting or expected to impact network infrastructures, particularly at the edge of networks, where increased computing power and automation are required to meet the quality of experience required by end users.

CommTech is driven by three main end demand verticals of carrier capex spending, enterprise IT spending and consumer tech spending. Main segments of business include routing, switching, Wi-Fi, network security, and software-defined networking. These companies provide hardware, software and services that enable the transport, routing, switching, aggregation, service delivery and management of video, data and voice traffic on communications networks. The solutions are used by communications service providers, cable and multiservice operators, Web-scale providers, submarine network operators, governments, enterprises, research and education institutions and emerging network operators.



Six megatrends are driving the overall industry:

Companies are investing in secure/agile networks, optimizing applications, hybrid work, the internet of the future, end-to-end security and edge computing. Cisco outline a $900B opportunity at its September Analyst Day with $400B comprised of its current $260B markets growing at a 5% CAGR and Expansion Markets shown below valued at $140B and growing at an 18% CAGR.



Further breaking down these markets:

- Secure Agile Networks ($98B TAM by 2025 growing at 8% CAGR). Campus Switching, Data Center Switching, SD Branch Routing, Compute and Wireless
- Hybrid Work ($83B TAM and 16% CAGR). Collaboration and Contact Center
- End-to-End Security ($80B TAM and 8% CAGR). SASE, NetSec, Zero Trust Security, Detection & Response, Application Security
- Internet for the Future ($50B TAM and 6% CAGR). Routed Optical Networking, Public 5G, Silicon & Optics
- Optimized Application Experiences ($36B TAM and 14% CAGR). Full Stack Observability and Cloud Native Platforms
- Services ($58B TAM and 2% CAGR)

Notable trends in the group are the rise of 5G, the 400G switching cycle, stabilized enterprise spending, and the shift to UCaaS over on-premise. Automated WAN is an area Juniper (JNPR) is targeting for growth in Routing with key market inflections like 400G adoption in cloud and service providers, 5G and clouding driving next-gen metro and edge architectures, and enterprise digitization. Cloud ready data center markets are growing at a 6-10% CAGR across Large Enterprise, Cloud Majors and Data Center Security markets comprising a $12B TAM opportunity by 2023 in 400G.

Indicators, Metrics & Stock Selection Framework

P/E, EPS CAGR, EBIT Margins, EV/Sales, ROE, Revenue Growth

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Networking - Enterprise						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
CSCO	Cisco Systems Inc	197.8B	9.65X	3.43X	12.64X	3.96%	6.29%	33.64%	24.73%	3.20%	3.05%
ANET	Arista Networks Inc	38.4B	19.80X	8.22X		24.56%	24.15%	38.70%	32.26%	21.56%	11.75%
NOK	Nokia Oyj (ADR)	26.7B	5.57X	0.86X	24.32X	4.07%	11.04%	12.50%	9.30%	7.89%	6.00%
ERIC	Telefonaktiebolaget LM Ericsson	20.8B	54.98X	8.26X	3.24X	7.22%	9.91%	13.92%	14.82%	-15.18%	9.02%
HPE	Hewlett Packard Enterprise Co	20.2B	5.16X	0.98X		1.48%	4.63%	10.62%	5.16%	-3.81%	2.08%
JNPR	Juniper Networks, Inc.	10.5B	10.63X	2.07X	14.09X	7.39%	15.33%	15.86%	12.45%	-2.95%	4.22%
ADTN	Adtran Holdings Inc	1.5B	15.93X	1.76X		49.12%	136.78%	2.00%	-0.47%	76.32%	56.74%
SCSC	Scansource Inc	0.7B	5.83X	0.27X		5.48%	8.79%	3.97%	-3.72%	20.80%	12.81%
CMBM	Cambium Networks Corp	0.6B	16.11X	1.86X		17.88%	51.76%	14.12%	5.89%	-33.59%	-18.14%
NTGR	NetGear, Inc.	0.6B	16.88X	0.35X		5.03%	-252.80%	8.15%	-1.24%	-119.48%	-15.65%
CMTL	Comtech Telecomm. Corp.	0.4B	12.57X	1.11X	19.64X	4.48%	#VALUE!	-6.94%	-3.62%	13.54%	1.23%

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Networking - T&M, Industrial											
KEYS	Keysight Technologies Inc	31.5B	17.46X	5.49X	24.25X	4.97%	8.10%	30.00%	17.69%	6.86%	1.64%
UI	Ubiquiti Inc	16.7B	35.17X	9.28X		12.52%	33.21%	27.53%	21.09%	-13.54%	2.84%
CIEN	Ciena Corporation	7.2B	11.17X	1.67X		8.82%	30.31%	11.19%	-7.12%	-13.62%	4.92%
VRT	Vertiv Holdings Co	5.0B	15.06X	1.39X		5.36%	50.86%	9.42%	2.53%	-18.82%	1.20%
NATI	National Instruments Corp	5.1B	14.33X	3.30X	29.97X	6.91%	21.20%	15.68%	6.69%	199.22%	13.46%
CALX	Calix Inc	4.7B	39.96X	5.12X		14.83%	17.72%	14.15%	6.82%	26.83%	15.45%
FN	Fabrinet	4.6B	12.65X	1.56X		10.57%	9.94%	9.30%	1.49%	25.88%	15.67%
LITE	Lumentum Holdings Inc	3.6B	7.47X	2.17X		10.35%	17.50%	30.77%	21.49%	-10.19%	16.45%
EXTR	Extreme Networks, Inc	2.5B	13.05X	2.08X		12.82%	32.56%	12.24%	10.14%	21.95%	10.48%
VIAV	Viavi Solutions Inc	2.4B	11.26X	2.28X		8.81%	30.13%	22.19%	8.17%	-35.14%	-11.10%
COMM	Commscope Holding Company Inc	1.6B	9.81X	1.31X	36.80X	2.80%	16.16%	11.42%	-0.11%	1.22%	4.57%
INFN	Infinera Corp.	1.5B	14.32X	1.28X	-0.46X	8.93%	140.57%	2.08%	-0.93%	-81.82%	-3.17%
HLIT	Harmonic Inc	1.4B	17.91X	2.43X		18.41%	57.15%	8.69%	5.53%	66.03%	22.91%
CLFD	Clearfield Inc	1.5B	17.42X	3.96X		20.77%	20.74%	23.56%	-3.01%	49.30%	35.28%
DGII	Digi International Inc	1.4B	17.43X	3.74X	27.45X	9.54%	38.62%	20.46%	9.21%	7.59%	4.61%
ATEN	A10 Networks Inc	1.2B	15.37X	3.97X		10.34%	13.05%	21.59%	17.97%	15.91%	12.17%
AUDC	AudioCodes Ltd	0.6B	8.63X	1.57X	7.99X	10.11%	16.92%	21.61%	18.55%	-11.18%	11.32%
ITRN	Ituran Location and Control Ltd. (US)	0.4B	5.55X	1.50X		9.29%	15.76%	20.16%	14.46%	6.86%	8.92%
RBBN	Ribbon Communications Inc	0.5B	10.95X	0.92X		5.08%	61.00%	12.25%	0.24%	-98.91%	-5.78%
GILT	Gilat Satellite Networks Ltd.	0.3B	9.79X	0.96X	-12.03X	15.74%	72.99%	1.18%	4.64%	0.00%	12.00%
CASA	Casa Systems Inc	0.3B	-8.11X	1.30X		21.39%	-86.63%	9.66%	7.04%	-375.00%	-30.82%
SPOK	Spok Holdings Inc	0.2B	57.18X	0.90X		-1.87%	-1164.29%	0.67%	-5.11%	-103.73%	-53.61%

Management Commentary

Cisco (CSCO) on Networking's greater importance this cycle…. "There are a lot of tailwinds. We're seeing networking right now is -- maybe it's cliche, but maybe more important to a lot of our enterprise customers than even it has been in the past. Three that I would highlight perhaps are IoT, hybrid work and the growth in the web scalers that we're seeing. So on the IoT side, you think of industrial IoT and some of the things, but we're actually seeing a growth in smart buildings and sensors and all kinds of things in the enterprise power of Ethernet. Lighting, for instance, is driving a lot of growth in sort catalysts for our campus business. On hybrid work, at the beginning of pandemic, a lot of people made very quick technology calls to make it so all their employees could work from home. And we think that's going to continue to be a catalyst for some time. And then on the web scalers, it's just driven by the continued incredible growth in that segment, and we're seeing new builds of AI and ML networks that are even more sort of network intensive, and that's contributing to our growth there."

Arista (ANET) on enterprise momentum…. "So look, for enterprise, there are two big pieces of our business; one is enterprise datacenter. It continues to be healthy. We've seen good growth. We continue to see good growth over there. You have Campus which we say call it as an adjacency, but it's growing really well. It's starting to near roughly 10% of our annual revenue. So to some point in the near-future it may not be just an adjacency, it will become our core business, it's growing very, very well. Because of the way we are exposed to large enterprises, which I think either field macro event later and cycle or certainly don't try to cut back as much or Campus we have such little penetration and good growth that we won't feel the macro upfront. I think we will be the last company to find out there's been a macro event not the first one. That demand has been good and sales teams are opportunistic, right. They'll find the customer that is still willing to spend a lot of money and sees that as a best opportunity. What's happening in Campus is there was this debate during COVID on do you upgrade or replace the campus or not, because people are not coming back to the office. But now it turns south, that even if you come back to the office one day a week you still need that network to work, because when you sit there, what are you going to do. You're going to do video conferencing all day with all of your colleagues all over the world. So you have to invest in that network and infrastructure and upgrade no matter what, which is what many enterprises are doing as well."

Fabrinet (FN) earnings call on end-markets, partnerships and supply chain…"Demand remains strong across the board with sequential growth from nearly all the end markets that we serve. Supply for some automotive components saw relief in the quarter. In the second quarter, we expect to start seeing optical communications revenue further supported by our new partnership with DZS, a global leader in access networking infrastructure, service assurance and consumer experience software solutions. Once those component shortages are clearing, we can see the revenue impact is almost immediate. So this past quarter, the most of -- the biggest part of the impact was on automotive. Some on the optical side as well, but mostly on the automotive side. And like I say, as we clear those shortages that have been flagging us and taking us and everybody else for some time, it is converting to revenue very quickly."

KeySight (KEYS) providing an overview…. "So Keysight Technologies. We're the number one player and we define as a $20 billion-ish served addressable market focused on test and measurement, electronic design and test, however you want to think about that. And in terms of underappreciated side of the business, I think people for a number of years have really thought of Keysight as a commercial communication, specifically a 5G story. So focused in the automotive markets with the big secular driver in the electrification of the drivetrain and the move towards increasing levels of autonomous driving. We have a semiconductor business which is benefiting now from obviously, not just capacity shortages in the semi space, but the efforts -- the recognition of a lot of places around the world that the semiconductor supply is a security issue, right, in both economic and in some cases, a true security issue, this idea of reonshoring fab capacities going in is a long-term driver of that business. And then we have this broader general electronics business, which is just benefiting from the electronic proliferation, that is going into so many different things, right, everything from IoT to health care to education end markets. And all of those businesses have been growing very steadily."

National Instruments (NATI) on the business and environment…. "For those that don't know us, we provide essential testing and measurement technology and the automation software that accompanies it in a wide range of industries. We are well positioned across R&D functions or validations. About 60% of the business goes into an R&D budget. And about 40% of the business goes into production, and that's across all of the industries that we serve. And we're well positioned in the set of really attractive verticals, and I'm sure we'll talk a lot about the growth opportunity and what we're seeing here and now within those verticals. For example, the areas of focus where we had shifted the strategy of the company to focus on areas like 5G and EV and active safety systems and cars. Those have started to grow significantly, but the overall performance is not a macro in 2020. We created business units to put focus on those end markets and hired a set of people into the company that have a lot more expertise on semiconductor, 5G, automotive, EV and ADAS, aerospace, defense, government, et cetera. And then we have, over the past few years, oriented our road maps to fill in the gaps, frankly, on what it takes to go from a broad-based platform to a broad-based platform that can help ultimately build an electric battery test system. We've augmented that road map shift with inorganic. So we've acquired some companies and particularly in EV and some in active safety systems in automotive."

OptionsHawk Executive Summary & Focus Stocks

Arista (ANET) continues to screen as the best-in-class name with its balance of strong growth/margins and reasonable valuation while benefiting from large tech spending. **Juniper (JNPR)** a value name seeing a comeback period with growth picking back up and looks better than Cisco (CSCO) at this point of the cycle. **Adtran (ADTN)** and **Cambrium (CMBM)** are solid small names that I could see as potential M&A targets. I have a lot of small cap favorites in this group and see network spend being a positive long-term growth driver. **Calix (CALX)**, **Extreme (EXTR), Clearfield (CLFD)** and **Digi (DGII)** are all favorites. **KeySight (KEYS)** was previously covered as a best-in-class name and **National (NATI)** as a solid value in small caps. **Fabrinet (FN)** is yet another quality small cap that keeps posting impressive growth although does carry lower margins than many peers. Lastly, **A10 (ATEN)** at 15X EBIDTA with impressive metrics across the board and double-digit growth screens attractive as a potential M&A target. It feels like a group due for consolidation with a lot of smaller names posting strong growth and not obscene valuations.

<u>Tech Equipment – IT Supply Chain</u>

Components: APH, TEL, GLW, TDY, SNX, FLEX, JBL, ARW, ST, NVT, LFUS, AVT, SANM, PI, PLXS, LAZR, ROG, VICR, MEI, TTMI, CLS, CTS, KN, BHE, INVZ, FARO, VPG, AEVA, EVLV, OUST, VLDR

International & Private Peers: World Peace Group, Future Electronics, Mouser Electronics, Digi-Key Electronics, Hon Hai, AT&S, Chin-Poon, Petasys, Unimicron

Intro

This is a hodgepodge group with names that all are providers of various electronic components across Communication, Automotive, Healthcare, Tech, Aerospace/Defense and other industries. Connectivity and Mobility are strong secular growth tailwinds for several names with EV, ADAS, Sensors, High Performance Computing and 5G key themes. The industry can be broken down into many segments and include some company presentations that highlight various end-uses for products of these companies and as well as market sizes.

We can effectively refer to this group as the IT Supply Chain and break them down into OEM Components, Electronic Manufacturing Services (Outsourcing), Component Distributors and Specialty Components. Lastly, this group contains a few niche specialty tech solution providers like Trimble (TRMB), OSI Systems (OSIS), Vocera (VCRA), FARO (FARO), Impinj (PI) and Knowles (KN) as well as LiDAR plays like VLDR, AEVA. Teledyne Technologies has transformed itself from a legacy A&D company into a diversified sensor provider serving a wide variety of end markets, including industrials, healthcare, A&D, and scientific research.

Industry Backdrop & Investment Considerations

The contract manufacturing industry by itself will grow from $595 billion in 2020 to $838 billion in 2025 - approximately at a 7.1% CAGR. The electronics manufacturing industry is broad and spans across government (aerospace & defense), consumer (smartphones, PC, etc.) and industrial products (robotics and automation), electronic components (connectors, semiconductors etc.), and health care (medical devices). The EMS industry is highly competitive and operating margins typically range between 1% and 5% with Hon Hain having a dominant global market share. Worldwide demand for PCBs is forecast to grow at a 5.1% compound annual growth rate (CAGR) from 2019 to 2024 driven largely by substrate and HDI technologies.

Worldwide sales of interconnect and sensor-related products were approximately $180 billion in 2020 and include electrical, electronic and fiber optic connectors and interconnect systems, antennas, sensors and sensor-based products and coaxial and high-speed specialty cable. Automotive, Broadband Communications, Aerospace, Industrial, Data Communications and Mobile are key end-markets.

Major themes across these groups revolve around Connectivity & Electrification. Smart & Connected provides a large market opportunity across heavy, medium, and light vehicles. Leveraging certain of the sensor products and embedded and wireless systems provides smart, connected, modular, and full-stack solutions that collect data from wireless sensors or related vehicle system information through a connected vehicle-area network and deliver actionable insight to drivers, maintenance workers and back-office personnel through mobile applications, web portals and via cloud Application Programming Interface for integration in other enterprise systems.

Key industry trends in PCB include shorter electronic product life cycles, increasing complexity of electronic products, OEM supply chain consolidation and increasing use of PCB technology in new end-markets.

Indicators, Metrics & Stock Selection Framework

ROE, ROA, P/E, EBIT Margins, Revenue Growth, EBIT Growth, EV/EBITDA, ROIC

EMS stocks historically only significantly outperform when industry capex has been declining and restructuring charges are down due to reduced supply and cost reductions that occur in a downturn, which drive better operating margins once the cycle starts to improve. Operating margins, ROIC, and customer exposure are the most important factors for EMS stock performance.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
IT Supply Chain						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
APH	Amphenol Corporation	46.5B	16.85X	4.00X	32.42X	2.28%	3.05%	20.00%	10.85%	23.24%	5.97%
TEL	TE Connectivity Ltd	37.8B	11.24X	2.54X	20.94X	6.24%	10.98%	18.22%	10.44%	-4.68%	1.77%
GLW	Corning Incorporated	27.7B	8.37X	2.26X	19.34X	3.87%	5.22%	17.48%	12.60%	-11.91%	-2.40%
TDY	Teledyne Technologies Incorporated	19.0B	17.36X	4.11X	34.37X	4.48%	8.08%	21.30%	15.67%	8.06%	18.55%
FLEX	Flex Ltd	10.1B	6.43X	0.40X	12.94X	3.21%	6.99%	4.49%	2.23%	21.28%	15.52%
SNX	TD Synnex Corp	9.2B	7.87X	0.22X		3.51%	9.04%	2.85%	2.39%	-0.33%	-0.49%
JBL	Jabil Inc	9.2B	4.19X	0.31X	9.28X	2.98%	5.38%	4.61%	0.79%	12.55%	5.80%
ARW	Arrow Electronics, Inc.	6.5B	4.39X	0.27X		-9.89%	-28.23%	4.67%	0.97%	52.50%	8.07%
ST	Sensata Technologies Holding PLC	6.4B	10.62X	2.37X	24.25X	3.23%	3.60%	21.10%	10.72%	-15.95%	-4.69%
NVT	nVent Electric PLC	6.3B	13.11X	2.49X	22.48X	2.51%	6.22%	17.70%	13.56%	18.97%	7.11%
LFUS	Littelfuse Inc	5.6B	9.31X	2.43X	14.01X	1.39%	-15.08%	19.14%	13.60%	29.48%	5.67%
AVT	Avnet Inc	3.9B	5.27X	0.24X		-6.91%	-13.75%	4.05%	-1.10%	22.66%	11.31%
SANM	Sanmina Corp	3.5B	5.43X	0.38X		6.45%	8.76%	5.29%	2.44%	42.98%	21.47%
PLXS	Plexus Corp.	2.9B	10.22X	0.69X	26.22X	7.73%	12.32%	4.73%	-3.35%	13.30%	6.97%
PI	IMPINJ Inc	2.8B	104.54X	11.53X		25.54%	46.70%	4.79%	-5.13%	420.47%	12.46%
LAZR	Luminar Technologies Inc	3.6B	-12.46X	87.22X	-18.79X	177.23%	-13.53%	-427.75%	-484.77%	59.57%	0.24%
VICR	Vicor Corp	2.3B	36.96X	5.39X	-86.68X	15.72%	91.32%	15.47%	1.86%	-55.77%	7.27%
ROG	Rogers Corp	2.2B	9.20X	2.26X		4.43%	12.69%	15.60%	5.71%	-21.21%	0.74%
MEI	Methode Electronics Inc	1.6B	9.58X	1.42X		5.16%	15.62%	9.91%	5.23%	-10.77%	1.41%
TTMI	TTM Technologies, Inc.	1.5B	6.09X	0.84X	16.62X	5.81%	5.87%	8.44%	4.21%	39.79%	7.63%
KN	Knowles Corp	1.5B	8.15X	2.00X		1.92%	4.83%	19.73%	15.38%	-24.24%	-15.79%
CLS	Celestica Inc	1.3B	4.34X	0.27X	15.77X	5.61%	5.43%	4.15%	3.10%	17.50%	12.52%
CTS	CTS Corporation	1.2B	8.81X	1.98X		3.89%	1.54%	3.78%	13.74%	14.65%	8.07%
BHE	Benchmark Electronics Inc	1.0B	7.60X	0.36X	21.86X	0.36%	28.35%	3.05%	-1.99%	65.23%	32.35%

Management Commentary

Amphenol (APH) on automotive and mobile…. "I remain confident that our long-term strategy to expand our high-technology interconnect, antenna and sensor offering, both organically and through complementary acquisitions, has positioned us well to capitalize on the many technology revolutions happening across the industrial market. The automotive market represented 20% of our sales in the quarter, and sales in the third quarter grew by a very strong 27% in U.S. dollars and 37% organically, driven by broad-based strength across most automotive applications and particularly strong growth once again in sales to electric and hybrid electric vehicle applications. The mobile devices market represented 12% of our sales in the quarter, and our sales to customers in this market increased by 13% in U.S. dollars and 15% organically. And this was driven by strong growth in sales of products incorporated into smartphones, wearables and laptops."

TE Connectivity (TEL) on backlog and end-markets…. "Our backlog remains near all-time high levels and our overall order levels imply solid demand across the majority of the markets we serve. Within this backdrop, we have some markets that are growing, some that are still in recovery mode back to pre-pandemic levels and others that are showing signs of moderation. Our backlog remains strong at $6 billion, which is almost 2x higher than pre-COVID levels. If you click down on orders by segment, Transportation and Industrial are continuing to show positive order trends. In Transportation, OEM auto production is still constrained by supply chain limitations and end demand remains above current levels of production. So we continue to have a favorable outlook for this market long term on both production as well as the content growth. In the Industrial segment, we continue to expect growth in comm air and medical markets as reflected in our orders, along with the benefits from wind and solar applications in our energy business. Renewables now represent 20% of our energy sales and the comm air market is still recovering to pre-COVID levels and both of these will be growth areas within the industrial segment in 2023."

Flex (FLEX) on EMS markets…. " I'd say what is happening in EMS and markets, Shannon, as you know very well, is a couple of interesting macros that is driving growth, right, for EMS as a whole. What is this whole thing about reassuring, onshoring, which has picked up pace over the last year, even through all this noise in terms of supply chain issues, is a significant area for a company like Flex to grow share. So we are seeing customers want to come to a company like Flex to be able to move complex products across the world. So we see market share gains as a result of that. And then couple of end markets, 3 end markets that we really like and we're really focused on. One is everything around electrification. So that whole space, electrification to renewables is a space that we're very focused on in terms of market share gain. And our portfolio is really appropriate for that because we have invested a lot in terms of EV, our own products and to manufacture for OEMs. So that is a good market share gain area. I would say the second would be everything around health, particularly around wearables and medical devices, is an area for us if we're focused on in terms of market share gain and then cloud as a whole."

OptionsHawk Executive Summary & Focus Stocks

Among the four largest stocks in this group **TE Connect (TEL)** screens as the best value for growth name at 11X EBITDA while set to outpace growth of peers. **Amphenol (APH)** is a consistent top operator and seeing upward revisions but is fully priced here. **Teledyne (TDY)** also fits that category as a long-time favorite but now looks fully priced with modest near-term growth. **Flex (FLEX)** is the clear favorite of the low margin plays with several tailwinds including onshoring and seeing strong positive estimate revisions while **Sanmina (SANM)** a quality small cap with similar characteristics. As we move to the smaller names **Impinj (PI)** is a rapid growth name of interest though priced very rich so hard to own at this level. **TTM Tech (TTMI)** screens as a top name among the smallest market caps at 6X EBITDA and could be an acquisition target. **Vishay Precision (VPG)** also fits that category and at 9.9X EBITDAS with one of the strongest growth profiles and EBIT margins in the group is one of the most attractive owns. **Innoviz (INVZ)** is a rapid grower seeing some unusual bullish options activity but trades at wild valuation and needs to be looked at closer as a speculative play.

<u>Internet – Information & Service Platforms</u>

Components: MTCH, BMBL, IAC, YELP, LZ, UPWK, FVRR, KIND, ANGI, ROVR, SOHU, TBLA, MAPS, BZFD, PRCH

International & Private Peers

Intro

This group features a lot of left for dead companies and a lack of attractive investments. A lack of profitability and strong business models has been the cause as well as a rising rate environment. FX has also been a major headwind. Online dating may be the best consumer internet sub-industry to weather a potential recession storm.

Industry Backdrop & Investment Considerations

Freelance platforms like Fiverr (FVRR) operates in over 450 categories and 8 verticals (e.g., Graphics & Design, Digital Marketing, Writing & Translation, Voice & Animation, Music & Audio, Programming & Tech, Business, Lifestyle). The combined value of these verticals—as estimated from 2018 US freelance income—is $115B while the broader US freelance market is above $850B.

There are 1.8 billion language learners globally that drive $61 billion in consumer spend for language learning (per HolonIQ). DUOL is disrupting the $61B language learning market with just 20% currently online and an even lower percentage on mobile.

ANGI is the market leader in online US home services marketplaces. The US home services market is ~$400B with only 10% of leads generated online and the remainder offline, through word of mouth/referrals. Porch (PRCH) is another tech-centric play providing software & services to several home service industries such as

Inspectors, Moving, Utilities, Warrants and Real Estate. Porch believes their TAM is $200B and will continue to expand as they add services and connect with more and more contractors in some highly fragmented industries.

The broader global (ex-China)/North America online dating market (including freemium and premium) was $5.3/$2.0 bn in 2020 and is projected to increase at a 13%/11% CAGR to $9.9/$3.4 bn in 2025, according to OC&C. The freemium global online dating market was $3.3B in 2020 and seen growing at an 18% CAGR to $7.7B in 2025 ex-China. There is a strong historical relationship between estimated monthly app downloads from Sensor Tower and reported payers for Tinder & Bumble.

Indicators, Metrics & Stock Selection Framework

MAUs, Revenue Growth, EV/Sales, FCF Margins, EBITDA Margins, ARPU

Unit economics can often be leading indicators for future stock price performance. This metric – defined as the ratio of LTV (customer lifetime value) to CAC (cost of customer acquisition), or contribution margin (gross profit less marketing expenses) – is a datapoint that illustrates the impact of improving network effects and user engagement. Network effects are a phenomenon by which a platform is strengthened by the addition of each incremental user and merchant. When network effects take hold, users are attracted to the platform organically, often through word of mouth, and the cost of customer acquisition through paid marketing can fall dramatically.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Info Service Platforms						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
MTCH	Match Group Inc	11.7B	13.61X	4.77X	33.91X	8.00%	57.79%	28.55%	27.91%	-44.13%	-9.43%
IAC	IAC Inc	4.1B	25.70X	0.98X	-29.35X	-0.35%	-75.46%	-3.50%	1.26%	1839.29%	-9.72%
BMBL	Bumble Inc	3.0B	18.41X	4.57X	37.99X	16.79%	50.02%	-14.14%	11.91%	235.71%	-4.39%
YELP	Yelp Inc	1.9B	5.43X	1.23X	8.30X	8.53%	79.77%	3.05%	17.87%	-11.93%	1.65%
LZ	LegalZoom.com Inc	1.7B	24.55X	2.36X	42.99X	4.93%	94.80%	5.57%	-3.32%	-2700.00%	7.20%
UPWK	Upwork Inc	1.4B	-183.30X	2.17X	-101.75X	18.44%	-118.82%	1.90%	0.93%	9.09%	-1.59%
FVRR	Fiverr International Ltd	1.1B	42.10X	2.84X	107.71X	8.84%	59.79%	7.68%	11.91%	27.55%	-10.84%
ANGI	Angi Inc	1.0B	26.04X	0.62X	-14.69X	8.85%	-46.28%	-4.54%	-3.80%	-5.00%	-1.29%
ROVR	Rover Group Inc	0.8B	33.60X	3.17X		30.18%	-84.11%	-15.62%	6.48%	-77.78%	58.84%
KIND	Nextdoor Holdings Inc	0.7B	-1.73X	0.62X		8.67%	-8.50%	-24.61%	-31.28%	204.17%	-17.66%
TBLA	Taboola.com Ltd	0.7B	4.21X	0.47X	28.00X	2.11%	-887.65%	-0.96%	1.77%	-25.27%	-16.50%
SOHU	Sohu.com Ltd - ADR	0.5B	-6.52X	-0.83X		-4.22%	286.16%	12.69%	-12.50%	-131.88%	-11.22%
PRCH	Porch Group Inc	0.2B	-7.98X	1.38X	-7.68X	21.96%	-58.02%	-44.61%	-20.51%	106.85%	-14.05%
BZFD	Buzzfeed Inc	0.1B	-144.57X	0.53X		3.18%	-43.15%	-6.33%	-3.83%	#VALUE!	12.34%
MAPS	WM Technology Inc	0.1B	-8.35X	0.77X	-11.37X	-1.42%	-66.61%	-4.23%	7.85%	-149.47%	-17.18%

Management Commentary

Match (MTCH) on new products and performance in a recession…. "So I don't think there's any question at this point that the tailwinds behind us in terms of people being willing to meet others online and socialize online, that era has arrived. And so now the question is, what's the right way to satisfy that interest? You've got a generation of people who spent a lot of time online, who are very comfortable online, who are very tech savvy. They're clearly digital native. And so what's the right product? And the Swipe notion has gained a ton of traction over the last decade and has proven itself to be a very strong, successful and resilient way for people to meet, but it's not the only way. Yes. Look, I think your description of it is accurate. It's a small purchase that makes people happy, but it is somewhat discretionary. And I think what we've seen now a few times is that when there's some kind of shock to the system, people do pull back on their à la carte purchases. They keep using the products, they keep engaging with the products, they generally keep their subscriptions, but they tend to calibrate their à la carte purchases."

OptionsHawk Executive Summary & Focus Stocks

Match (MTCH) is down to 13.5X EBITDA and 34X FCF though estimates are coming down sharply. It is a quality name but undergoing a tough period of slower topline growth and likely need to be patient as more of a long-term value buy. It is difficult to find anything nice to say about the rest of the name sin this group though **Yelp (YELP)** at 5.4X EBITDA and 8.3X FCF with positive growth could be an acquisition play.

Internet – Social & Advertising

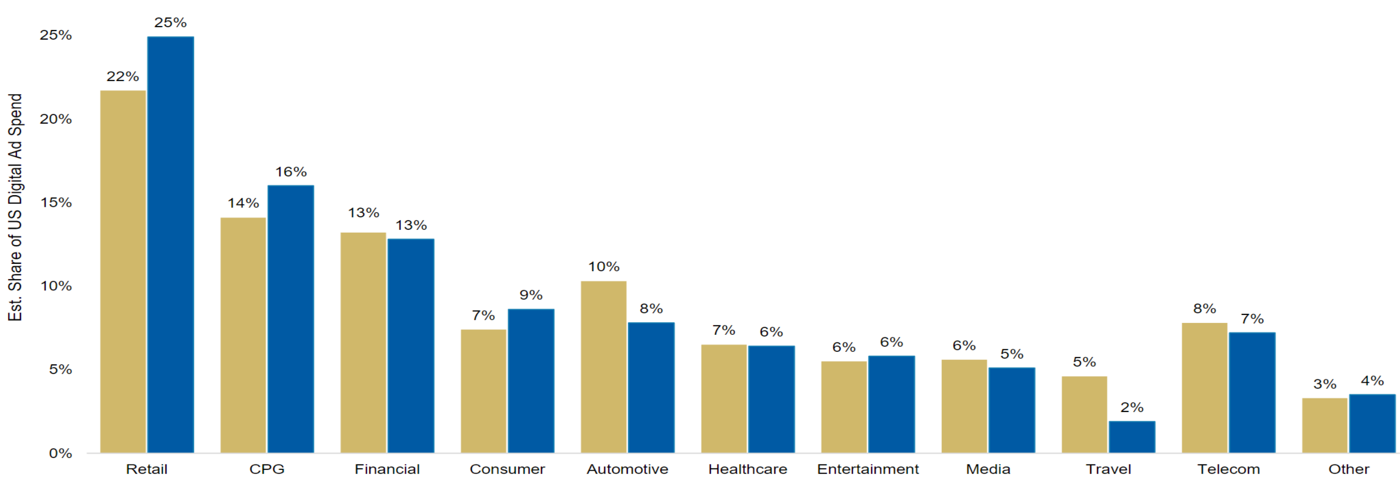
Components: GOOGL, GOOG, META, BIDU, PINS, SNAP, WB, YY, CRTO, MOMO, QNST, ZH, OPRA, YALA, SKLZ, DAO, MCG, ISPO, QUOT

International & Private Peers

Intro

This group is led by mega-caps dominating the digital advertising space via search, social media and other online applications. The group also has a large China presence (BABA, BIDU, WB, YY, MOMO, DAO) which needs to be separated.

The internet advertisers came under pressure in 2022 due to a litany of issues including the new Apple privacy policy and TikTok competition. The group is very sensitive to the Macro situation due to advertising spend but expectations across the group have already reset sharply. Online Ad indicators improved recently with cautious optimism into the Holiday Season but 2023 remains an unknown. CPG companies (beverages) started spending a bit more on advertising in 2H of summer/fall after the spring/summer cuts. Travel, financials/credit cards, entertainment/media, and home services have also held in or improved. Apparel, electronics and tech/crypto have weakened. TikTok is even seeing a slowdown in spend growth and also could see a US ban in 2023 due to security concerns which would boost many of these names.



Opex discipline is a key debate across the sector heading into '23. The set-up into 2023 has potential to see Y/Y growth rates reaccelerating which would likely put floors in the stocks. Google has PMax and performance-based CTV optionality on YouTube while Search is also likely to be the most resilient in a downturn. The mixed macro backdrop is also likely to make it more challenging for smaller platforms (like SNAP/PINS/KIND) with less performance-driven (and more experimental) ad businesses to scale. Competition is in focus with TikTok, Apple (search and DSP in progress), Microsoft, Netflix, Disney, Uber and others increasing their emphasis on building ad businesses. The importance of e-commerce to driving the online ad industry speaks to further risk.

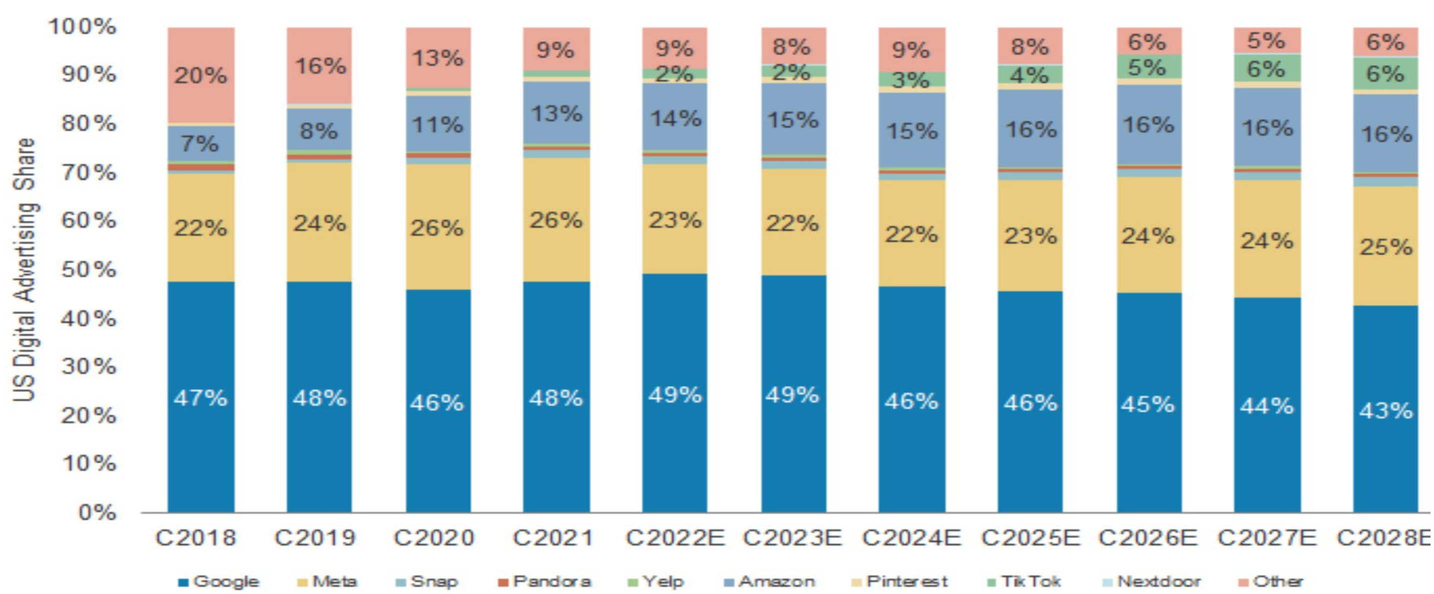
US TikTok, YouTube Shorts and Meta Reels ad revenue is expected to reach ~$9.4B in ’23 (in total) as all of the companies expand their ad load and experiments to build scalable performance ad businesses. Content creator compensation could become the next battleground to increase creator platform stickiness.

Platforms such as Facebook, YouTube and Instagram have massive scale and influence, and large revenue ecosystems that invite scrutiny. Expect a multi-year regulatory cycle, which kicked off in 2018 with the Cambridge Analytica news, and may continue until US anti-trust cases are decided or settled (possibly 2024-2025, but appeals are possible). Regulatory issues remain a key overhang to this group.

All leading social media platforms, including YouTube, FB and IG are investing billions in their SFV (Short Form Video) platforms and aggressively ramping up content. Usage growth, monetization, and regulation of SFV will have a significant impact on Meta and Snap stock performance and could be a sentiment driver for Alphabet (YouTube). All three platforms are seeing macro pressure on ad revenues, compounded by lower usage and monetization as usage shifts to SFV, both of which could reverse by 2024.

Industry Backdrop & Investment Considerations

Digital Advertising innovation is strong and several emerging themes (eCommerce ubiquity, new engagement models, improving ad efficiencies) could unlock incremental TAM and deliver strong growth with an estimated 13% CAGR through 2023 for the $488B market and 18% 2021-2026 CAGR to reach $860B. Online channels already account for nearly 60% of total advertising spend. Another meaningful tailwind that likely drives continuous ad dollars to online channels is the evolution of new online-first and online-only business models.



The most interesting industry theme has been a demonstrable shift in consumer/enterprise behavior including rising eCommerce, streaming media & food delivery, volatile digital ad and cloud computing trends & headwinds to travel/ridesharing.

While time spent is a good growth driver for online media companies in the long term, new use cases and business models will evolve the overall internet infrastructure. These trends will improve user experience and enable productivity gains across various areas. The advancements in machine learning and AI over the last few years alone have been a huge part of enabling new businesses to emerge via the existing internet infrastructure.

Social Commerce is a strong emerging theme with Facebook, Instagram, Snap and Pinterest. The "Creator Economy" is also growing with the rise of creator tools, monetization aspects and the role of the "influencer". As mobile commerce continues to gain share within eCommerce expect short form video to gain more traction with brand advertisers, driven by 1) level of creativity of video ads 2) high engagement from users 3) effectiveness of video formats at conveying brand-related messages.

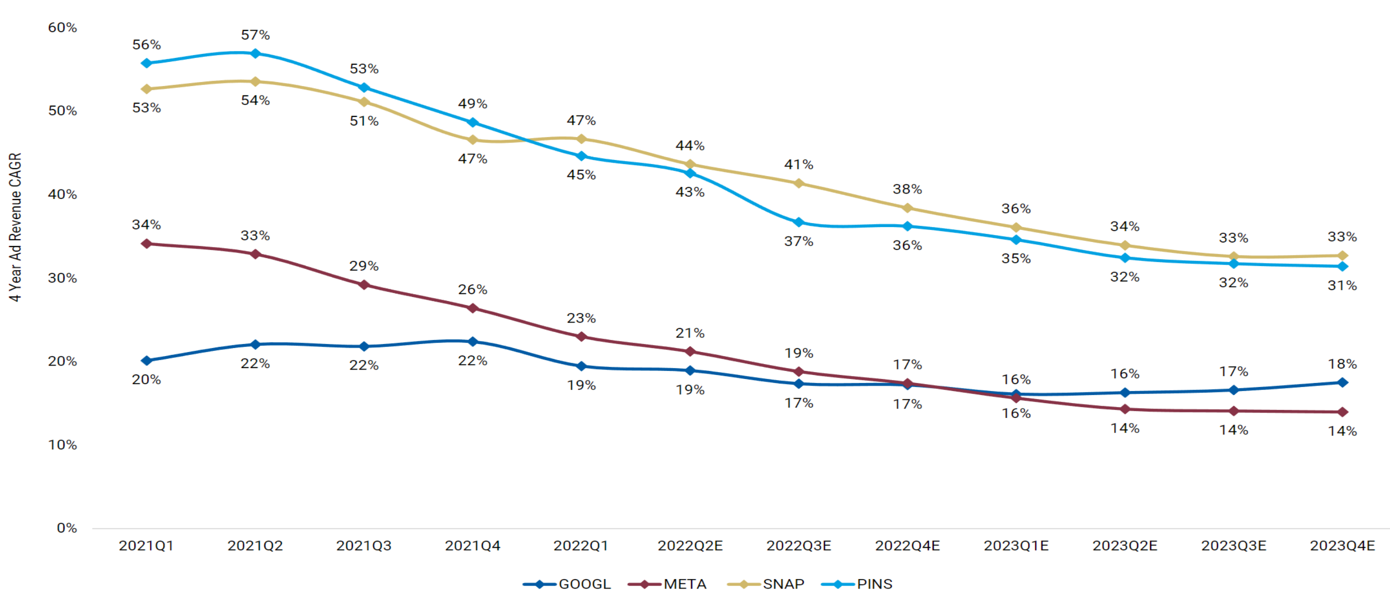
Indicators, Metrics & Stock Selection Framework

P/E, EV/Revenues, EV/Gross Profit, Revenue Growth, MAUs, ARPU

Solid topline and healthy profitability growth to be the key areas of emphasis among internet names, given the multiple opportunities ahead in digitization era. Traditional frameworks such as DCF and P/E multiples have become less useful given that many fast-growing companies generate little profitability. Understanding what drives multiples is a useful tool in portfolio positioning. Estimate revisions are one of the most important factors influencing stock price performance, stocks that warranted upside revisions to estimates saw multiples expand the most. Similarly, downward estimate revisions are typically punished with sharp multiple compression.

Internet stocks tend to fall into one of three categories:

Valuation & Comps



Management Commentary

Pinterest (PINS) on platform improvements…. "By making Pinterest more relevant to our users, we can increase and deepen their engagement with the platform. We're doing this in multiple ways, including improving the personalization on our core services, leveraging our unique opportunities as a content platform and broadening our appeal to emerging demographics. In fact, sessions in Q3 grew meaningfully faster the MAUs, which indicates that we are deepening engagement with our users. We believe growing sessions should drive multiple top line benefits, such as reducing user churn, improving overall monetization and growing revenue per user. We're also making Pinterest more relevant to users by leveraging our unique human-curated content and upgrading our overall content ecosystem. This type of curation is very unique to Pinterest and is fundamentally different user activity than what typically occurs on other platforms. This creates a highly efficient way to get relevant content for users across our ecosystem. User-curated content is a key aspect of our content strategy, and we expect it to remain a significant differentiator. Finally, we're working to expand the relevance of our platform to emerging audiences, specifically Gen Z, by building products and experiences that resonate with them. Over the past 3 years, growth from our global Gen Z demographic has outpaced growth from all other demos, and Gen Z users continue to grow despite the pandemic unwind and SEO headwinds."

Alphabet (GOOGL) on YouTube…. "Moving to YouTube, another big priority. We remain focused on long-term growth for our community of viewers, creators and advertisers. To that end, we announced some exciting changes at our Made on YouTube event last month. First, improving the monetization of Shorts. This is a big deal for creators and for our business. We'll introduce revenue sharing on Shorts early next year. This update makes YouTube the only platform where creators can monetize their content across short, long and live formats at scale. Shorts continues to show great user momentum, and we continue to invest in our mobile video tools for creators. We are seeing mobile-first creators investing more in the platform, creating content that helps the broader community grow. TV is a big area for us as well. Nielsen reported that YouTube was the leader in streaming TV viewership in the U.S. in September for the first time. And then there's YouTube. Not only can users now buy more products and videos, but shopping as entertainment experiences are bringing the magic of our creators to the shopping experience. First, we're helping advertisers understand how they can drive effectiveness with every campaign they run on YouTube. Full funnel is a key way to do this. Buying YouTube across consideration, awareness and action allows marketers to meet customers at different stages in their purchasing journey, which we know are increasingly complex while delivering towards a key business goal. Two other areas where we're continuing to invest, Connected TV and Shorts. First on CTV. Eyeballs keep moving away from traditional TV. On average, global viewers are watching 700 million-plus hours of YouTube content on TV daily. And according to Nielsen, during the 2021-2022 U.S. broadcast seasons, YouTube reached more viewers during primetime on CTV than any linear TV network."

OptionsHawk Executive Summary & Focus Stocks

The weak advertising backdrop is well known at this point so the question really comes down to have estimates come down enough and are multiples cheap enough while META/GOOGL continue to invest for the future. **Google (GOOGL)** looks to be the better own as a multi-year value play with it having YouTube and other businesses allowing for more durable growth through the cycle and at 16.8X FCF it is hard to find a better value while META remains a concern with estimates crashing. **Baidu (BIDU)** is even cheaper than Google and with better growth, but weaker margins and the added China embedded risk. If BIDU can show improving margins, it can be a major winner the next few years. **Pinterest (PINS)** has the best growth profile though forward estimates being revised sharply lower and with activist involvement and new management still see value here as an acquisition target. **Snap (SNAP)** is still very richly valued and a $14B market cap leaves plenty of room to the downside. There are not really any desirable traits of the smaller names in this group.

Internet – eCommerce

Components: AMZN, BABA, PDD, JD, MELI, CPNG, EBAY, SE, CHWY, ETSY, VIPS, W, FTCH, IQ, RVLV, POSH, OSTK, DADA, MYTE, LQDT, JMIA, WISH, SFIX, BARK, BZUN, PRTS, DIBS, LVLU, GRPN, REAL, TDUP, RENT

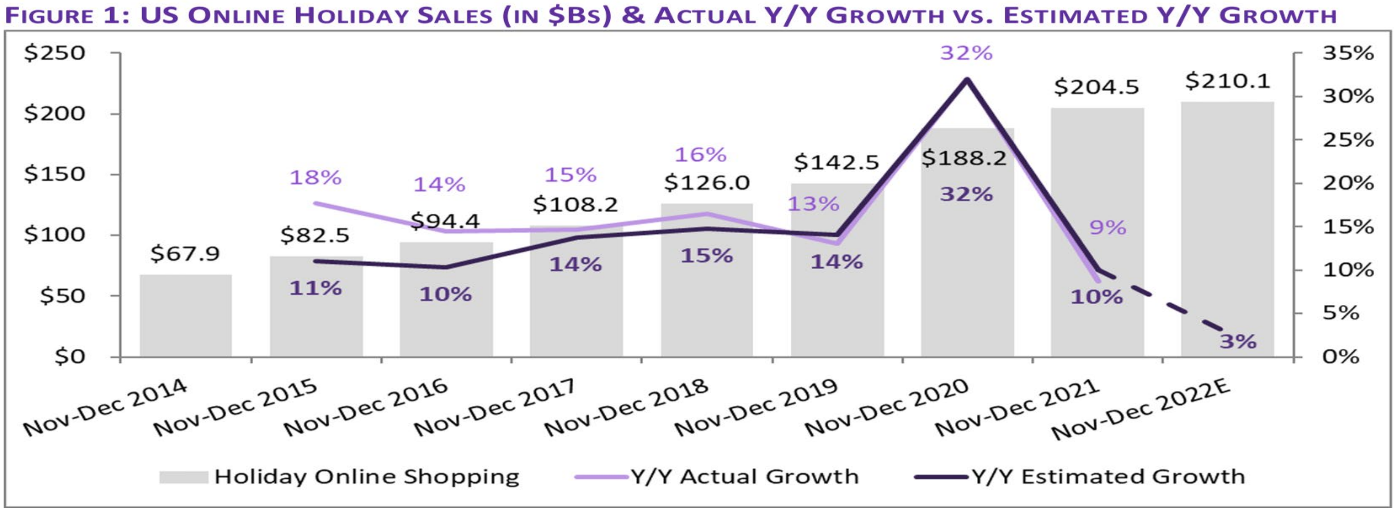
International & Private Peers: Rakuten, Zalando

Intro

This is a large group dominated by Amazon (AMZN) among the US companies There are a few more notable US plays like eBay (EBAY), Etsy (ETSY), Chewy (CHWY), and Wayfair (W) and this group also includes the commerce platform plays like FTCH, RVLV, REAL and MYTE. Specialty marketplace commerce websites have seen a lot of IPOs with newer names like POSH, TDUP and DIBs. It makes sense to separate out the international plays into their own grouping with Alibaba (BABA), Sea (SE), JD (JD), Pinduoduo (PDD), Mercado Libre (MELI), Coupang (CPNG) and others.

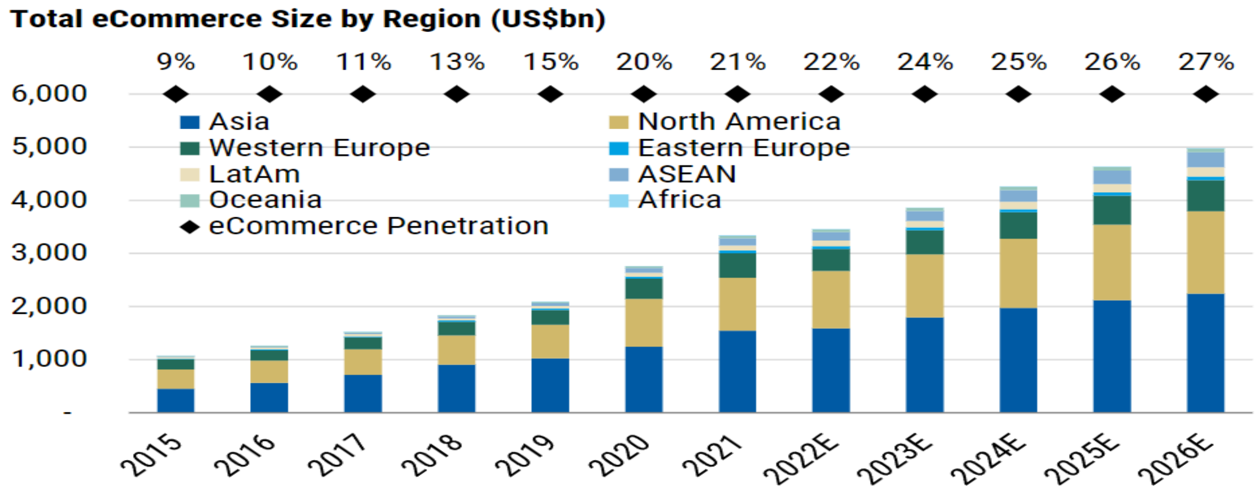
We are seeing ecommerce names foray into the advertising markets with Amazon and Mercado Libre two with large opportunities. eCommerce spending faced real tough comps in 2022 and Black Friday & Cyber Monday spending still showed resiliency and ecommerce penetration continues to rise, a secular growth theme.

FIGURE 1: US ONLINE HOLIDAY SALES (IN $BS) & ACTUAL Y/Y GROWTH VS. ESTIMATED Y/Y GROWTH



The theme for 2023 in US ecommerce names will be reacceleration. Experts forecast a sizable ~US$2 trillion incremental GMV opportunity for the global eCommerce market through '26E, with gains even for the highest-penetration areas of the market. The key drivers behind multiyear eCommerce growth outlook remaining intact – with logistics improvements, the shift to mobile internet, and marketplace assortment expansion among fundamental factors enabling growth globally.

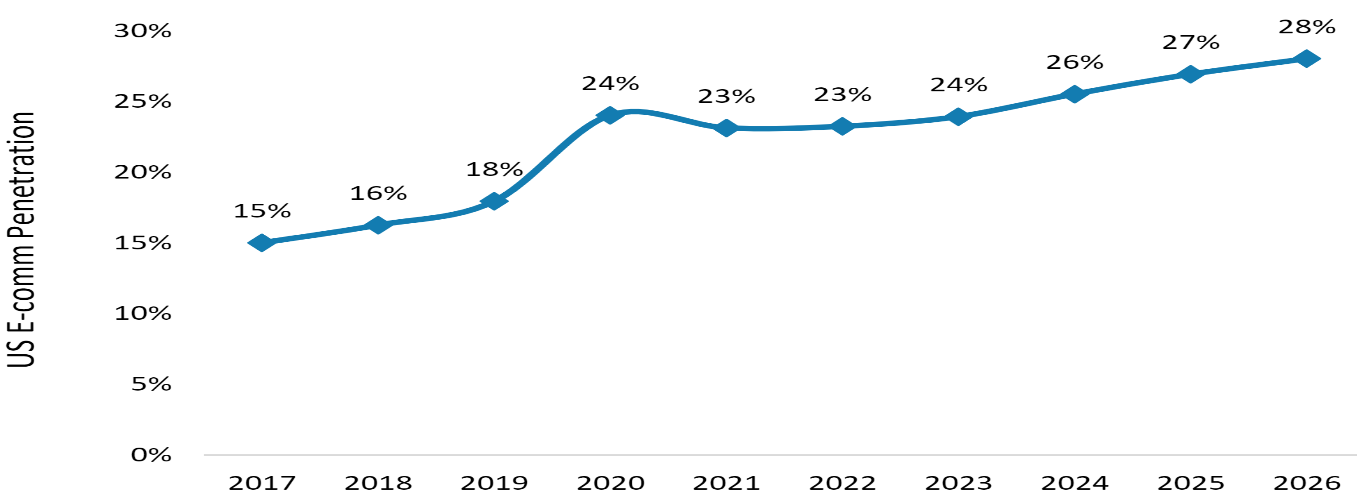
In China, a potential change in Covid policy is seen as the main driver near/mid-term while the industry continues to mature with a slowdown in growth rates. This will continue to pressure valuations while competition, macro, and regulatory environment remain key factors as well. China e-commerce sector growth forecast is revised down from 13% to 10% for 3-year CAGR over 2022-25 at MSCO.



Industry Backdrop & Investment Considerations

International markets where the opportunity remains relative untapped is a key growth driver for eCommerce. Within the last decade, ecommerce has grown from 5% of the global retail market share to 28% in 2020, per Euromonitor.

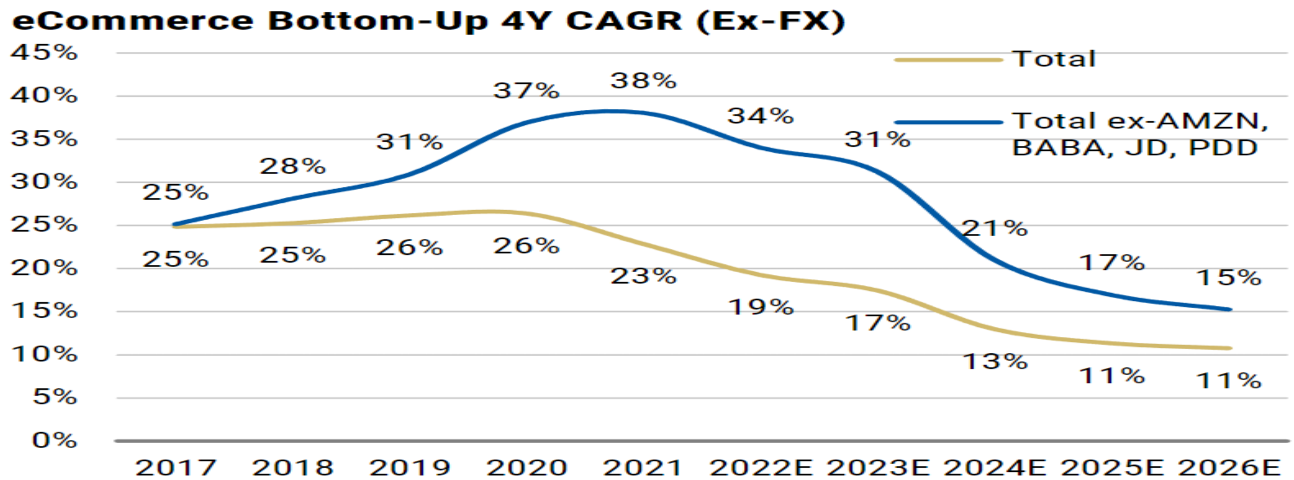
Among the low-penetration categories for eCommerce the biggest opportunities lie in CPG, groceries, health personal care and beauty, and furniture & home furnishings from a TAM perspective.



ThredUp (TDUP) and Poshmark (POSH) are positioned in a growing resale market, estimated the apparel & footwear resale maker at $7B in 2019 and growing to $36B by 2024 at a 39% CAGR, so a sizeable growth opportunity. The US online apparel & footwear resale market sits within the broader US secondhand market, which includes thrift & donation (e.g., Salvation Army, Goodwill), totaling $28B in 2019 that should grow to $64B in 2024. The secondhand market should more than double its market share in the next decade to 17% of the US apparel market in 2029, becoming the second-largest category after off-price. Industry growth is likely to benefit from the growing importance of sustainability among consumers as well as the declining stigma of shopping secondhand. Category and International expansion remain key upside growth areas for these companies.

Local eCommerce is a strong emerging theme as food delivery, ship from store, and buy online and pickup in store all became more normative consumer behaviors. Further, the rise of the last mile logistics platforms like UBER, LYFT, DASH have invested strongly in this opportunity.

The global subscription box market reached a value of $18.8B in 2020 and is seen growing at a 20% CAGR through 2026. Several retailers across diverse industries, such as personal grooming, cosmetics, food and beverages, apparel, etc., are adopting numerous marketing strategies for expanding their consumer base.



Indicators, Metrics & Stock Selection Framework

Revenue Growth, EV/Sales, EBIT Margins, GMV, Take Rates, EV/GMV

A strong eCommerce stock-picking framework combines (1) forecast share gains, (2) exposure to higher-growth categories, (3) favorable forecast EBITDA margin trajectories, (4) discounted trading multiples versus history, and (5) attractive growth-adjusted valuation multiples.

Valuation & Comps

Company	Country	MS Rating	Last Price	Price Target	Upside/ Downs.	Market Cap ($mn)	EV ($mn)	ADTV ($mn)	EV/Revenue 2022	EV/Revenue 2023	CAGR 20-23e	EV/Rev. to '21-'24 CAGR	EV/EBITDA 2022	EV/EBITDA 2023	CAGR 20-23e
LatAm eCommerce															
Mercadolibre Inc.	Argentina	OW	800	1,550	94%	39,771	39,811	518	3.8x	3.0x	50%	0.09x	34.6x	21.4x	100%
Magazine Luiza S.A.	Brazil	EW	4.3	4.0	-8%	5,397	5,904	123	0.8x	0.7x	13%	0.07x	20.6x	14.3x	29%
Americanas S.A.	Brazil	EW	17.5	20.0	14%	2,988	4,017	80	0.7x	0.6x	15%	0.07x	7.8x	6.3x	10%
Via S.A.	Brazil	UW	3.2	2.5	-22%	974	1,509	40	0.3x	0.2x	6%	0.04x	4.6x	4.1x	10%
Mobly S.A.	Brazil	EW	2.5	3.0	21%	50	NM	1	0.0x	0.0x	17%	NM	0.2x	NM	21%
Westwing Brazil	Brazil	NC	1.5	NC	NA	30	NM	0	-0.2x	-0.2x	13%	NM	1.7x	4.8x	NM
LatAm Median									**0.5x**	**0.4x**	**14%**	**0.07x**	**6.2x**	**6.3x**	**21%**
US eCommerce															
Amazon.com Inc	United States	OW	115	175	52%	1,171,651	1,124,346	7,042	2.1x	1.9x	16%	0.14x	14.9x	11.5x	19%
eBay Inc	United States	UW	38	37	-3%	20,933	22,692	236	2.4x	2.4x	2%	NM	8.5x	9.0x	-8%
Chewy Inc	United States	EW	32	39	22%	13,546	12,943	28	1.3x	1.2x	16%	0.10x	NM	72.4x	NM
Etsy Inc	United States	EW	94	83	-12%	13,738	15,139	309	6.2x	5.7x	15%	0.77x	37.0x	37.3x	-6%
Wayfair Inc	United States	UW	36	65	82%	3,752	5,297	31	0.4x	0.4x	0%	0.05x	NM	NM	NM
Farfetch Ltd.	United States	OW	8	32	295%	3,549	2,784	15	1.1x	0.9x	22%	0.03x	2.4x	16.3x	NM
Revolve Group Inc	United States	EW	24	28	17%	1,797	1,578	10	1.5x	1.3x	28%	0.07x	23.1x	19.4x	7%
FIGS, Inc.	United States	EW	9	11	23%	1,691	1,493	8	2.9x	2.4x	33%	0.12x	29.6x	21.1x	6%
Mytheresa	United States	EW	12	12	0%	1,035	959	0	1.4x	1.2x	20%	0.09x	73.9x	22.8x	14%
Poshmark Inc	United States	EW	14	16	17%	1,065	484	13	1.3x	1.1x	17%	0.08x	NM	NM	NM
Stitch Fix Inc	United States	EW	4	4	2%	429	197	24	0.1x	0.1x	1%	NM	NM	NM	NM
RealReal Inc	United States	EW	2	4	163%	144	74	12	0.1x	0.1x	37%	0.00x	NM	NM	NM
ThredUp Inc.	United States	EW	2	4	93%	206	35	3	0.1x	0.1x	20%	0.01x	NM	NM	NM
US Median									**1.3x**	**1.2x**	**17%**	**0.08x**	**23.1x**	**20.3x**	**7%**

Company	Country	MS Rating	Last Price	Price Target	Upside/ Downs.	Market Cap ($mn)	EV ($mn)	ADTV ($mn)	EV/Revenue		CAGR 20-23e	EV/Rev. to '21-'24 CAGR	EV/EBITDA		CAGR 20-23e
									2022	2023			2022	2023	
EMEA eCommerce															
Zalando SE	Germany	EW	20	34	73%	5,061	4,370	39	0.4x	0.4x	11%	0.06x	11.6x	9.3x	-6%
Allegro.eu SA	Poland	EW	25	29	17%	5,165	5,859	13	3.2x	2.6x	41%	0.07x	14.4x	12.4x	14%
ABOUT YOU Holding SE	Germany	NC	5	NC	NA	933	891	1	0.5x	0.5x	NA	NA	NM	NM	NM
ASOS PLC	United Kingdom	EW	625	1,200	92%	721	861	9	0.2x	0.2x	8%	0.03x	5.3x	3.2x	-3%
Boohoo Group PLC	United Kingdom	UW	40	56	41%	553	253	7	0.1x	0.1x	17%	0.02x	2.1x	3.1x	-15%
Jumia Technologies AG	United Kingdom	UW	6	5	-14%	565	452	5	1.8x	1.4x	26%	0.05x	NM	NM	NM
Boozt AB	Sweden	NC	56	NC	NA	327	249	1	0.4x	0.4x	19%	0.03x	6.4x	5.3x	8%
Global Fashion Group	Luxembourg	EW	1	NA	NA	243	18	1	0.0x	0.0x	16%	0.00x	0.5x	0.3x	246%
Hepsiburada	Turkey	EW	1	NA	NA	304	87	0	0.1x	0.1x	45%	0.00x	NM	NM	NM
MADE.com Group Plc	United Kingdom	EW	4	25	516%	15	NM	1	-0.2x	-0.2x	6%	0.26x	1.3x	30.1x	NM
Westwing Group SE	Germany	NC	5	NC	NA	102	62	0	0.2x	0.1x	2%	0.29x	NM	3.7x	-28%
EMEA Median									**0.2x**	**0.2x**	**16%**	**0.04x**	**5.3x**	**4.5x**	**-3%**
APAC eCommerce															
Alibaba Group Holding	China	OW	79	140	77%	205,955	160,264	297	1.3x	1.3x	21%	0.10x	9.3x	7.5x	8%
Meituan	China	OW	174	240	38%	133,238	122,580	488	3.9x	2.8x	39%	0.09x	NM	48.8x	23%
JD.com, Inc.	China	OW	53	80	50%	86,197	70,296	394	0.5x	0.4x	17%	0.04x	21.5x	14.3x	16%
Pinduoduo	China	EW	61	75	24%	82,809	71,498	658	4.3x	3.5x	35%	0.15x	20.2x	15.9x	NM
Sea Ltd	Singapore	OW	54	123	128%	33,939	23,906	93	2.1x	1.6x	39%	0.08x	NM	NM	NM
Naver Corp	S. Korea	EW	204,500	230,000	12%	23,603	23,761	101	4.1x	3.6x	21%	0.24x	19.7x	17.7x	7%
Coupang Inc	S. Korea	OW	16	25	52%	29,040	26,185	108	1.2x	1.1x	27%	0.07x	NM	48.0x	NM
Z Holdings	Japan	OW	394	800	103%	20,778	14,989	58	1.2x	1.1x	18%	0.10x	6.5x	5.7x	13%
FSN E-Commerce Ventures Ltd	India	OW	1,278	1,889	48%	7,454	7,447	6	16.0x	11.2x	45%	0.25x	NM	NM	56%
MonotaRO	Japan	EW	2,144	2,500	17%	7,366	7,355	24	4.6x	3.9x	20%	0.21x	35.4x	27.5x	22%
Rakuten Group Inc	Japan	EW	619	700	13%	6,840	NM	55	0.0x	0.0x	14%	NM	0.1x	NM	47%
Vipshop Holdings Ltd	China	EW	9	10	7%	6,394	3,818	14	0.3x	0.3x	1%	NM	3.9x	3.7x	2%
ZOZO	Japan	EW	2,994	3,300	10%	6,263	5,806	24	4.6x	4.2x	10%	0.49x	14.9x	13.8x	9%
Mercari	Japan	EW	2,119	2,500	18%	2,373	2,360	154	2.3x	2.0x	30%	0.10x	NM	NM	NM
Temple & Webster Group Ltd	Australia	OW	5	7	41%	419	356	2	1.3x	1.2x	35%	0.07x	33.6x	32.2x	26%
Kogan.com Ltd	Australia	NC	3	NC	NA	216	218	2	0.4x	0.5x	11%	NM	15.9x	10.6x	-13%
Redbubble Ltd	Australia	EW	1	1	61%	124	59	1	0.2x	0.2x	17%	0.02x	NM	NM	NM
Adore Beauty Group Limited	Australia	EW	1	2	36%	75	56	0	0.4x	0.4x	17%	0.05x	16.3x	30.8x	-16%
APAC Median									**1.3x**	**1.3x**	**20%**	**0.10x**	**16.1x**	**15.9x**	**13%**

Management Commentary

Amazon (AMZN) on streaming media space…. "Well, we're incredibly excited about what we're doing in the streaming content space. And just the success of Lord of the Rings and the success of Thursday Night Football -- and just Thursday Night Football, if you look at it, it has 5 million, 6 million viewers, has been more than double that. It's got 20% higher viewership in the 18 to 34 demographic, which is really important to a lot of different constituents, which is about 20% higher than before and larger than the NFL window for it. And so we're really excited about it. There are a number of parts to what we're trying to do with streaming media. The reality is that our private video offering and all of that content is a really important ingredient in when people choose to sign up for Prime or not. It's always been something that's driven Prime subscriptions. But increasingly, you see more and more people who are signing up to Prime because of the video content. So that's very attractive. And then when people sign up to Prime, even if they sign up from the video content, they tend to spend money with us in our stores and our e-commerce offerings. And so I do think, over time, we have opportunities to make our Prime video business a stand-alone business that has very attractive economics. We have a lot of video on demand. We have a channels program where a very large number of third-party media providers will ingest their content into our technology. I think sports, as you know, we've been doing a lot more there, Thursday Night Football and UEFA and Champions League. And I think you'll continue to see us investing in sports. I mean, sports is such a unique asset. If you look every year at the most watched programs, sports often occupies 75% of those spots. And they drive live engagement and they drive Prime subscription. So I think you'll expect to see sports."

Mercado Libre (MELI) on Advertising…. "So on advertising, I think most of the rollout of the new product tools have come towards the end of the quarter. And the impact of those -- and this is obviously a constantly evolving and improving product, I think we should see more in the upcoming quarters than the entire third quarter. I think what we see in the third quarter is just the natural evolution of an advertising business that there's very strong demand for despite the macro backdrop given where we play along the conversion funnel. And as we continue to invest resources and roll out the tools that came out towards the end of the quarter, but also new tools that we have, we continue to think that there's a lot of upside from our advertising solutions to come in the future. Bob, so the margin structure for the advertising business is fairly consistent across geographies. It's a very high-margin business. I think we've set EBIT margins in the high 70s, low 80s. Attach rates or adoption do vary by geography. Mexico is the country with the highest attach rate. There is, I think, a combination there of 1P business but also simply how far we've executed and what the overall market dynamics are. But in general, I think with 1.3% of overall penetration, it's still incipient in any of the geographies that we look at, and we expect very solid growth over a multiyear period across all of the geos."

Etsy (ETSY) on key customer metrics…. "The vast majority of our buyers, for a very long time, were buying only once a year, and 40% were buying 2 or more times a year. We call those repeat buyers. Post pandemic, we've shifted so that 50% of our buyers are now buying 2 or more times a year, and the average for them is 5 times a year. So we've made this shift, and that seems to be maintaining. Geographically, on the new buyers, attracting new buyers to come in, we've seen more significant growth internationally. Best-in-class search is one of the key factors that I think has helped us grow our audience and continue to grow frequency. Like I said, our repeat buyers are only about 50% of the audience. But here's an example of something that increases take rate without changing pricing for sellers, and that's Etsy Ads. So we have a product, it's an optional product for sellers, that allows sellers to spend some of their own budget to make themselves more prominent in a search result as the old paid inclusion model. And we manage both the bid and the ask and sort of guarantee or we self-police ourselves to give our sellers a very acceptable, attractive minimum return on ad spend. Another example is Etsy Payments. We've expanded where Etsy Payments is available to use, that's Etsy's internal payments platform. We know that buyers that transact through Etsy's payment platform, there's a much higher conversion rate. We now have about 93% of our GMS running through Etsy Payments, and that has also grown take rate."

OptionsHawk Executive Summary & Focus Stocks

Amazon (AMZN) now trades 13X EBITDA but is still not FCF positive and faces slowing growth, weaker consumer environment and cost headwinds. Estimates are coming down and it is hard to get comfortable owning shares until we see better operational execution. Of the Asia ecommerce names **Pinduoduo (PDD)** is the most impressive name with strong FCF and seeing major upward revisions in both EPS and Revenue estimates. **Alibaba (BABA)** at 8X EBITDA and 17.8X FCF looks to be a value buy. I am less optimistic with **Sea (SE)** on profitability struggles. **MercadoLibre (MELI)** is a top pick now at a $42B market cap and starting to show operating leverage while having a very strong growth outlook and like all the strategic moves the company has made to position for the next up-cycle. **Chewy (CHWY)** screens as the best short of the larger names while **Etsy (ETSY)** at 25X EBITDA and 32X FCF is a bit too rich considering a slowing growth profile but remains an excellent operator and unique business. As you look at the many names under a $3B market cap there are a lot of trashy companies with terrible financials, an area ripe for shorting. There are two names that screen as fairly attractive at cheap valuations with rising revisions and profitable, **MYT (MYTE)** and **Liquidity Services (LQDT).**

Internet – Travel OTA

Components: BKNG, ABNB, TCOM, EXPE, TRIP, MMYT, VCSA, SABR, LIND, TRVG, DESP

International & Private Peers

Intro

Broad trends indicate some deceleration in travel bookings, but activity remains strong. November BAC aggregated US credit & debit card spending growth on airlines & lodging bookings was stable, while US RevPAR is showing robust growth vs. 2019, and Asia ex-China continues to recover. Sensor Tower's travel app November data (see report) suggests that DAU (daily active users) growth for OTAs (BKNG (Booking Holdings) and EXPE (Expedia)) accelerated vs Oct. Despite macro headwinds. Travel trends did peak May/June 2022 so looking into 2023 there will be tough comps in focus. Booking's share gains in lodging bookings and potential for Asia driven rebound over the next 12 months sets up well. Macro, Marketing and Multiple are the key three debates for OTA in 2023. 2023 travel demand is highly macro driven and the slope of forward bookings growth for ABNB/BKNG/EXPE remains largely tied to the state of the consumer.

Industry Backdrop & Investment Considerations

Online Travel is one of the more mature industries in the Internet-sphere and with a recent accelerating top-line and margin expansion the narrative will shift from pent-up demand to competitive position, market share gains, and execution. There are pockets of opportunity for global OTAs to benefit from growth in less penetrated regions & segments of travel. The global travel industry is seeing reaching $1.7 trillion by 2026 excluding alternative accommodations with $950B from online travel bookings at 55% market share.

The "live anywhere" trend redefining work is likely to benefit the home-sharing names. The core business of OTAs, hotel distribution/metasearch, is slowing down and being disrupted by large Tech names like Google.

Key to the success of the hotel OTAs has been the fragmentation of the underlying market, necessitating an aggregator to bring the product to market. However, the market underneath them is rapidly consolidating. Experiences is one of the more interesting growth TAMs estimates at $1.3 trillion. Alternative accommodations are a thriving trend in this group with Airbnb a clear leader.

Relative exposure to the fastest growing areas of the industry (shared/alternative accommodations & under-penetrated geographies/sub-segments of travel) will allow some players to outgrow their peers. In addition, two key elements of how travel evolves – owning more of the consumer wallet per trip via local/experiences & marketing leverage (deeper customer relationships and in-app purchasing) are likely going to be the biggest driver of increased market share, faster growth and operating margin leverage.

Indicators, Metrics & Stock Selection Framework

Revenue Growth, EV/Sales, EBIT Margins, EV/EBITDA

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Travel OTA						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
BKNG	Booking Holdings Inc	76.2B	14.63X	4.51X	17.70X	13.21%	17.92%	24.26%	22.96%	9.11%	6.20%
ABNB	Airbnb Inc	58.2B	17.94X	6.06X	25.60X	12.50%	23.82%	7.17%	36.12%	98.45%	5.87%
TCOM	Trip.com Group Ltd (AD	22.2B	70.43X	8.05X		49.42%	432.52%	1.35%	9.51%	69.16%	0.71%
EXPE	Expedia Group Inc	14.1B	6.95X	1.46X	4.29X	9.17%	18.50%	9.00%	35.76%	-1.69%	-0.22%
MMYT	Makemytrip Ltd	3.0B	34.51X	4.19X		33.65%	36.01%	-8.69%	-2.27%	-89.00%	95.94%
TRIP	Tripadvisor Inc	2.6B	8.35X	1.61X	8.13X	15.74%	53.41%	1.00%	5.99%	-31.46%	10.88%
SABR	Sabre Corp	2.0B	63.45X	2.32X	37.11X	24.03%	-614.26%	-27.20%	-27.97%	29.63%	5.85%
VCSA	Vacasa Inc	0.6B	-21.43X	0.88X	36.49X	12.11%	-32.71%	-14.10%	5.85%	2.04%	34.18%
TRVG	Trivago NV - ADR	0.6B	2.33X	0.46X	4.89X	19.10%	-218.98%	2.78%	7.96%	-676.67%	-8.66%
LIND	Lindblad Expeditions Hc	0.4B	-71.24X	2.46X	-21.70X	29.13%	-154.40%	-75.34%	-43.64%	35.81%	15.64%
DESP	Despegar.com Corp	0.4B	7.51X	0.60X		7.68%	-209.26%	-28.22%	-18.40%	-34.95%	75.93%

Management Commentary

Booking (BKNG) on travel and key indicators….. "So we see that people are prioritizing travel, even though the macro has certainly tightened a little bit since then, they are prioritizing travel. And the other thing that we're seeing across all of our markets is that customers are not trained down in terms of the start of a combination that they're going to, and they're not reducing their length of stay, which is the usual two kind of early indicators that we look for. When things are going to slow down, those tend to be the canary in the coal mine type indicators for us. And we're not seeing that in Europe, and we're not seeing that in our business globally. The final piece of kind of what we talked about on the call for disclosure is to give people a view as to what we're seeing into the future is we also said that we see a nice build of our book of orders for Q1."

OptionsHawk Executive Summary & Focus Stocks

Trip.com (TCOM) has been a strong performer but valuation looks to be getting ahead of itself at 70X EBITDA with weak FCF margins, a potential short if see that rebound growth slow. **Expedia (EXPE)** still looks like a value trap facing a lot of headwinds and seeing negative revisions in a travel boom is not a good sign. Those leaves **Booking (BKNG)** and **Airbnb (ABNB), which** are both high-quality companies, the former is a bit cheaper and with stronger metrics making it the preferred own. However, **ABNB** is seeing incredible growth with it trading just 18X EBITDA and 25.5X FCF and has shown real impressive operating leverage the past two quarters with upward revisions to both EPS and Revenues, so it is also one of the better long-term growth names. The remaining small names are low-quality though **TRIP** may eventually be an acquisition target.

Semiconductors – SemiCap Equipment

Components: TSM, ASML, AMAT, LRCX, KLAC, GFS, UMC, TER, ENTG, RMBS, AEIS, KLIC, ACLS, SITM

International & Private Peers

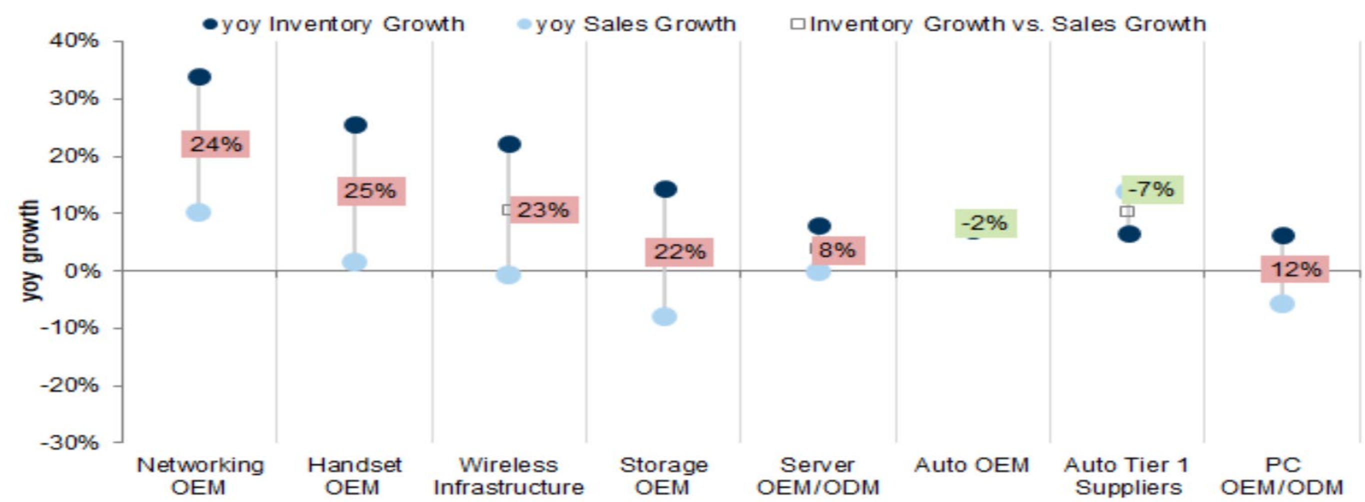
Intro

The Semiconductor industry can be divided into five key markets: Analog, Microcomponents, Digital Logic, Memory, and Discrete & Optoelectronics.

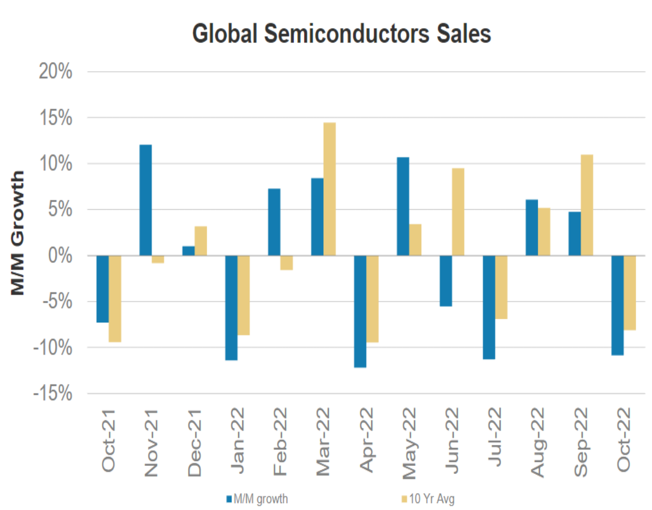
General-Purpose	2019E Market Size	2020E Market Size	2020E Growth	2020E Market Percentage	2018-2023E CAGR
Analog	$23,085	$24,534	6.3%	5.2%	3.0%
Discrete	$22,317	$24,053	7.8%	5.1%	5.1%
Memory	$111,497	$136,058	22.0%	28.9%	0.8%
DRAM	$62,435	$70,700	13.2%	15.0%	-5.2%
NAND	$44,544	$60,499	35.8%	12.9%	8.3%
Microcomponents	$73,537	$76,472	4.0%	16.2%	1.8%
MCUs	$17,952	$19,111	6.5%	4.1%	3.3%
MPUs	$54,117	$55,845	3.2%	11.9%	1.1%
Optoelectronics	$32,689	$34,296	4.9%	7.3%	5.1%
Nonoptical Sensors	$10,628	$11,390	7.2%	2.4%	7.3%
General-Purpose Logic	$13,771	$14,556	5.7%	3.1%	5.5%
Total Semiconductor	**$418,302**	**$470,698**	**12.5%**	**100.0%**	**3.2%**

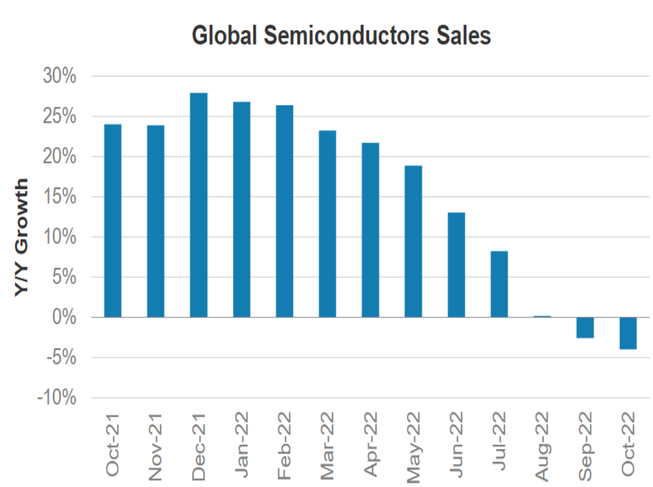
The semiconductor cycle has started to roll over despite the long-term picture remaining bright. The industry is seeing a lot of change with the move to onshoring with the US restrictions on China is also having an impact.

Inventories continue to build, with stacked inventory across manufacturers, distributors, and customers at 70 days above the median; but the growth rate is slowing, and customer days came down slightly. In the aggregate, we are seeing the pace of inventory growth decelerating, from+21 days q/q in 1Q22, +18 days q/q in 2Q22, and finally +10 days q/q in the most recent quarter. In looking deeper at the sub-segment breakdown within semiconductor companies, Memory and Computing maintained an outsized contribution to overall DOI growth, growing 41 days and 23 days, respectively; which should have been expected given company guidance in 2H22. Smartphone and networking semis company DOI growth was again the second highest grower at +9 days, but more importantly, foundries, WFE, and component companies all saw DOI decline q/q - the absolute dollar level of inventory from semis companies was up 4% q/q. After a year and a half of lean distribution inventory that remained at or below long-term median levels, distributor inventories have grown materially over the past two quarters, now sitting 15 days above the long-term median level. These numbers suggest to us that the inventory correction is in an early phase. In the first phase of a semiconductor inventory correction, we tend to see inventory shift from customer balance sheets to producers. But excess inventory tends to weigh on overall supply/demand dynamics, wherever it resides.



Semiconductor Industry Association data for October showed sales down 10.9% m/m compared to the 10-yr average change of down 8.1%. Broad-based markets such as analog and microcontrollers were above seasonal while memory was weak. Despite the macro headwinds, semiconductor IDMs and foundries across leading- and lagging-edge as well as memory/storage and logic, appear to be executing their technology or node transitions in-line with their respective roadmaps. Taiwan foundry could have a tough 1H23 given a slower sell-through and inventory digestion for smartphone and PC.



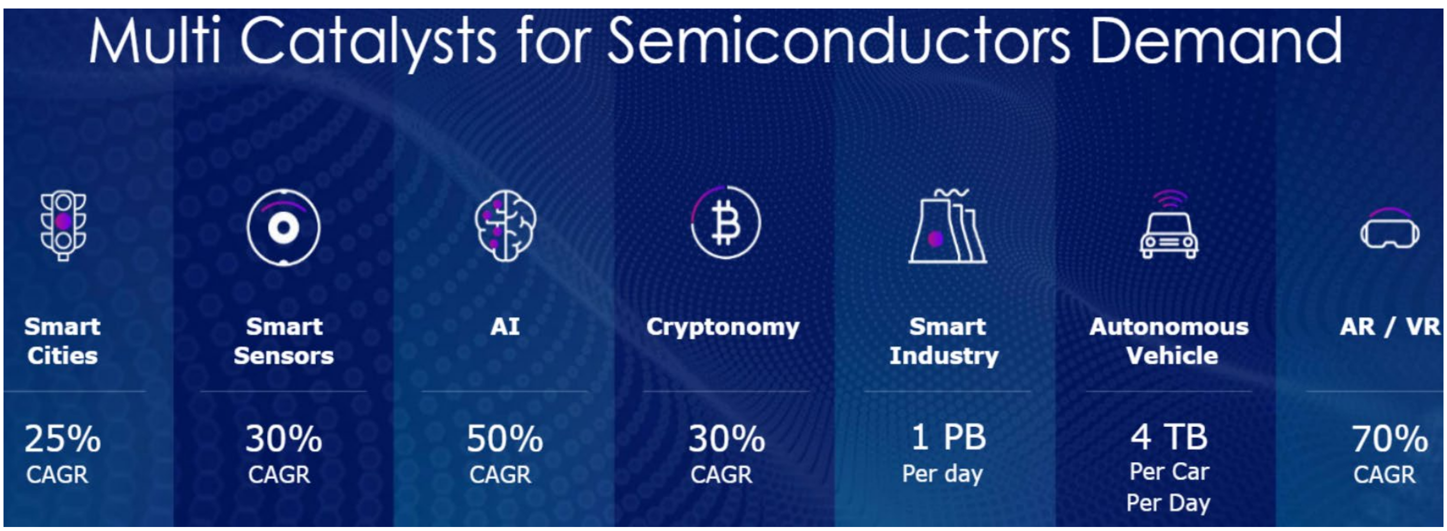


Industry Backdrop & Investment Considerations

The global Semiconductor industry is valued around $440B. Over the past five years, semi sales have grown at a 5% annualized pace or 2x the growth of global GDP, enabling secular megatrends such as cloud computing, AI, ubiquitous mobile broadband (5G, Wi-Fi), Internet-of-Things, smart factories/robotics, and advanced industrial/electric vehicles. Semiconductors are integral components for virtually every electronic device used today from smartphones, to PCs, to servers, to automobiles, to industrial robotics, making self-sufficiency in semi technology and manufacturing critical for global superpowers.

	2019E Market Size	2020E Market Size	2020E Growth	2020E Market Percentage	2018-2023E CAGR
Automotive	$41,848	$46,624	11.4%	9.9%	8.3%
Communications	$137,960	$162,102	17.5%	34.4%	3.4%
Wired	$21,072	$22,020	4.5%	4.7%	1.0%
Wireless	$116,888	$140,082	19.8%	29.8%	3.8%
Consumer	$42,798	$47,436	10.8%	10.1%	2.9%
Data Processing	$145,689	$159,352	9.4%	33.9%	-0.7%
Compute	$119,872	$127,373	6.3%	27.1%	-2.3%
Storage	$25,816	$31,979	23.9%	6.8%	11.5%
Industrial	$50,007	$55,183	10.4%	11.7%	6.7%
Total Semiconductor	**$418,302**	**$470,698**	**12.5%**	**100.0%**	**3.2%**

If we further break down some key trends in the industry we can see the growth opportunities are abundant. AI/Machine Learning is a $25B TAM by 2022 growing at a 58% CAGR, Cloud Infrastructure is a $90B TAM by 2022 growing at a 13% CAGR, IoT a $43B TAM by 2021 growing at a 25% CAGR, EV/Autonomous Vehicles a $60B TAM by 2022 growing at a 25% CAGR, and 5G and Gaming also large markets. 5G could drive nearly $2.2 Trillion in global economic activity over the next 15 years, per GSMA, the telecom industry's trade association.



Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, P/E

Unit Shipments, ASPs, Gross & Operating Margins, R&D and SG&A Cost Trends, Days Sales Outstanding, Inventory Days, and Debt Ratios are other key metrics for assessment. Analyzing end-market exposure is always important for this group.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Semicap Equipment						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
TSM	Taiwan Semiconductor Mfg. Co. Ltd. (ADR)	405.0B	7.64X	5.20X		6.68%	-4.19%	40.95%	16.63%	28.19%	13.22%
ASML	ASML Holding NV (ADR)	235.9B	32.01X	10.51X	45.53X	20.26%	34.68%	36.27%	53.22%	-18.45%	-5.39%
AMAT	Applied Materials, Inc.	90.0B	12.98X	3.83X	12.09X	-2.34%	-2.41%	30.49%	17.89%	-16.42%	-8.43%
LRCX	Lam Research Corporation	60.8B	10.63X	3.39X	14.24X	-15.50%	-22.04%	31.34%	14.82%	5.20%	5.23%
KLAC	KLA Corp	54.5B	13.00X	5.65X	15.62X	-16.03%	-26.80%	42.27%	32.63%	20.87%	14.23%
GFS	Globalfoundries Inc	33.4B	10.34X	3.98X	-350.63X	-1.36%	-6.04%	2.55%	16.29%	60.96%	3.48%
UMC	United Microelectronics Corp (ADR)	18.0B	88.35X	47.42X	24.12X	-8.74%	-29.99%	24.26%	18.96%	21.10%	9.39%
TER	Teradyne, Inc.	13.8B	13.56X	4.13X	25.26X	-1.27%	-8.37%	33.26%	26.08%	-15.26%	-10.41%
ENTG	Entegris Inc	10.1B	14.83X	4.63X	-192.50X	15.30%	10.53%	26.50%	8.26%	2.82%	1.20%
RMBS	Rambus Inc	4.0B	12.93X	6.64X	19.08X	5.05%	1.21%	64.12%	59.53%	29.63%	26.17%
AEIS	Advanced Energy Industries, Inc.	3.4B	9.72X	1.82X	16.36X	-6.76%	-22.57%	14.49%	7.44%	28.91%	19.04%
KLIC	Kulicke and Soffa Industries Inc.	2.7B	13.63X	2.29X		32.05%	96.00%	32.96%	24.42%	-69.98%	-44.79%
ACLS	Axcelis Technologies Inc	2.7B	11.99X	2.74X		5.56%	1.51%	19.22%	21.36%	79.44%	37.60%
SITM	SiTime Corp	2.2B	19.50X	5.87X	38.73X	-15.33%	-37.75%	29.78%	11.56%	28.19%	32.09%

Management Commentary

Global Foundries (GFS) Investor Day on importance of foundries, how they win, end-markets, and capital efficiency…"An $89 trillion world economy that sits on a $2.2 trillion electronics industry with thousands of customers, or thousands of suppliers that exists only because there's a $600 billion semiconductor industry. You have hyperscalers, OEMs and what we call IDMs. And the thing about IDMs, there's no such thing as a pure-play IDM anymore. They're all hybrid. They manufacture some of their own material, they come to foundries like GF. There isn't a single IBM that doesn't use GF as well. And then it amazes me every time I say this, the entire world economy comes down to 5 companies in foundry space, serving a $96 billion market opportunity. We focus on platform solutions addressing attractive secular end markets. We drive this portfolio through purpose-built innovation and platforms. We forge deep customer partnerships not only on technology innovation, but on how we build capacity together. We leverage our global manufacturing footprint. Handsets down first half of this year versus first half of last year, yet, GF grew 14% revenue. Because we're winning market share intercepting trends, the trend of 5G transition, and winning more applications in the smart mobile devices. Home and industrial IoT. Today, for every human in the U.S., there's 5 connected devices, right? And that's going to double in the next -- by 2025, and 5x growth by 2030. Automotive, we're going from internal combustion engine, ICE, to what we call autonomous connected electrification, ACE. Level 2, EV, 3x more semi than an internal combustion car. If it's Level 4 autonomous driving, it's 6x more content of semiconductor. And last that we talked about is our capital-efficient model. It's with partnerships, it's with customers, it's with governments, it's with GF to create the economic outcomes that make sense for us, which you will see from 2020 through 2025, the investments we have in flight. We will increase our manufacturing output 50%."

ASML (ASML) on logic outperforming…. "So I think if you look at the past few years, and you look at our revenue, system revenue, you see that our logic revenue -- logic versus memory split is around 70% or so, plus or minus, in the past few years. So clearly, a stronger percentage going towards logic versus memory. Combination there. I think first off, if you look at the number of layers, look at the mix of layers and therefore, the litho spend on a per wafer basis, it's the highest from a litho intensity perspective on logic compared to DRAM or NAND. I think that's one. The other is that, again, when you talk logic, there's a broader, we talked about these advanced and mature nodes. Mature falls, a lot of that case, into that category as well. So you're also not only talking about the advanced growing. If you looked at our Investor Day material, we talked about future nodes, node-on-node growth, in logic around 30%, whereas memory, it's 10% to 20%, node-on-node. So future nodes are growing not as aggressive in terms of spend per node as they are in logic and the absolute number is higher in logic. So that gives you a stronger demand there in logic. The other piece, as I mentioned, being the mature versus advance, you only have this long tail of advance that goes into -- sorry, long tail of mature that goes into the logic bucket, but also these new applications that we're talking about, secular ones around some of the server space today, but also the AI, the 5G that we've talked about, those things are all going into the advanced logic. Yes, you need memory with it. But it's going to be a logic being a primary secular driver. And I think that combined -- those 2 combined is really what's fueling the strength in our logic space, and we expect that will continue going forward, as we talked about in our Investor Day material."

Applied (AMAT) on China uncertainties…. "I'd probably say still -- you and I were talking about China before we started this. It's probably really all the dynamics of the China market. The trade rules -- we highlighted we have $2.5 billion impact from the trade rules unmitigated. We will, of course, work on confirming customers that we can ship to and clearing some of the customers with respect to those trade rules. Other customers might change plans. So there's a lot of uncertainty there. And then the China market itself, that's been a large market for Applied. It's been as high as 33% of our revenue. It was 20% in the last quarter. The China market itself is a very important market. It's been growing in our mature technologies, what we call the ICAP space. It's been growing significantly. And so I think really, it relates back to how is China going to evolve as the largest economy, evolve with the trade restrictions that have been put in place. And will it keep investing at the same pace on the trailing edge technologies or the more mature technologies. I think those are probably as big a questions at least relative to the other dynamics because just one more thing. When we think about '23 or '24, what we're really thinking about is over 5 years, it grows to a $1 trillion industry. So we agree. It's hard to call '23, it's hard to call '24 when we're making our decisions to hire engineers, hire manufacturing people, hire technologists, it's the roadmap that we're building for '25, '26, '27, '28. And so you have to make those decisions with that context in mind."

OptionsHawk Executive Summary & Focus Stocks

KLA Corp (KLAC) is a favorite large cap here despite an outlook for negative growth it is one of the few seeing upward revisions and trades with impressive profitability metrics to peers, so a favored name. **Taiwan Semi (TSM)** also screens well and is not expected to see earnings/revenues contract as much as peers. **ASML (ASML)** continues to trade at a massive valuation premium and although sees strong growth ahead is in a negative revision cycle, a short candidate for multiple compression. **Global Foundries (GFS)** is the preferred name of the entire group with it benefitting from the major onshoring theme. **Teradyne (TER)** is a top mid-cap name but not at this part of the cycle and needs to see valuation come in while **Entegris (ENTG)** has weak profitability metrics. **Axcelis (ACLS)** screens as the most attractive small cap across the board and would make a nice acquisition target.

Semiconductors – Data Center, Networking/Storage & Gaming

Components: NVDA, INTC, AMD, MRVL, MTSI, TSEM, CRDO, IDCC

International & Private Peers: Renesas, SG Micro, StarPower, Hua Hong

Intro

Cloud capex is seeing some near-term pressures but long-term will continue to benefit from the exponential growth in computing complexity required for AI and high-speed networking. Demand for public cloud services is expected to nearly triple by 2026 to $300bn (27% CAGR). AMD continues to take market share in servers.

In the last ~2 years, there have been over $200bn in announced US semiconductor capacity plans of which 138.5bn seem to refer to specific near-term projects. Though budgets for facilities remain in flux, announcements highlight commitment to capacity.

Per IDC, demand for data is expected to grow at a roughly 20% CAGR over the next 4-5 years. In order to process this data, hyperscalers/enterprises will need to consistently upgrade server/hardware to support growing data consumption. Notably, Gartner estimates the cloud IaaS (infrastructure as a service) market already represents a $100bn+ TAM, which expected to grow at a near 30% CAGR to over $300bn by 2026.

Growing data traffic is creating bandwidth barriers and bottlenecks, requiring hyperscalers/network operators to deploy solutions that can enable faster connectivity speeds in a costeffective manner. Today, hyperscalers are in the process of upgrading networks to handle transfer speeds at 400Gbps and beyond (800Gbps also on the horizon). 400G+ applications are one of the fastest growing segments of the interconnectivity market.

Industry Backdrop & Investment Considerations

Data Center is a key large and growing market, providing AI, data analytics, graphics and scientific computing, across hyperscale, cloud, enterprise, public sector, and edge data centers. Demand by Cloud Data Center providers for faster data delivery speeds at cost-effective prices is growing rapidly, where higher speeds are necessary to process the current growth in traffic.

Professional Visualization is another key market with GPU computing solutions to enhance productivity and introduce new capabilities for critical parts of the workflow for such major industries as automotive, media and entertainment, architectural engineering, oil and gas, and medical imaging. Design and manufacturing encompass computer-aided design, architectural design, consumer-products manufacturing, medical instrumentation, and aerospace. Digital content creation includes professional video editing and post-production, special effects for films, and broadcast-television graphics.

Underlying growth in the Telecom market is driven by the proliferation of wireless and wired devices from smartphones and other devices to basestations, as well as the data rich applications and services they enable such as mobile Internet, cloud computing, video-on-demand, social media, global positioning functionality and location-based services. Growth in next-generation Internet and Internet of Things applications drives global demand for communications infrastructure equipment requiring amplifiers, filters, receivers, switches, synthesizers, transformers, upconverters and other components to expand and upgrade cellular backhaul, cellular infrastructure, wired broadband and fiber optic networks. Semiconductor products and solutions must continually deliver greater bandwidth and functionality as the demands of customers increase.

Growth in the network communication market is driven by strong demand for digital content, ubiquitous access, security, increased enterprise adoption of advanced video communication and the trend towards an increasingly global and mobile workforce.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, P/E

Unit Shipments, ASPs, Gross & Operating Margins, R&D and SG&A Cost Trends, Days Sales Outstanding, Inventory Days, and Debt Ratios are other key metrics for assessment.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Datacenter, Networking, Storage											
NVDA	NVIDIA Corporation	417.0B	39.62X	15.40X	78.69X	8.94%	35.77%	47.15%	30.21%	-42.02%	-22.87%
INTC	Intel Corporation	112.0B	6.58X	2.03X	-14.37X	-4.12%	6.18%	28.10%	12.23%	-44.29%	-16.43%
AMD	Advanced Micro Devices, Inc.	107.3B	13.69X	4.43X	24.62X	5.91%	7.06%	24.76%	19.59%	-13.47%	-7.26%
MRVL	Marvell Technology Inc	34.1B	17.33X	6.43X	24.80X	2.55%	-2.08%	32.84%	14.17%	-7.42%	-3.26%
TSEM	Tower Semiconductor Ltd. (USA)	5.1B	7.95X	2.67X	512.34X	-0.57%	6.59%	12.84%	7.13%	60.40%	10.68%
MTSI	MACOM Technology Solutions Holdings Inc	4.6B	18.50X	6.50X	14.44X	8.42%	9.88%	31.25%	22.29%	2.93%	0.70%
CRDO	Credo Technology Group Holding Ltd	2.1B	55.23X	8.64X	-113.13X	47.91%	188.00%	-9.27%	-45.47%	-229.41%	95.14%
IDCC	InterDigital Inc	1.4B	5.09X	2.64X	5.31X	-3.91%	-17.51%	16.74%	21.65%	-9.36%	8.59%

Management Commentary

Nvidia (NVDA) on gaming markets…. “So we had highlighted at the very onset of when we saw the inventory correction need to help folks understand what we saw in terms of solid sell-through in terms of gaming. So we came up with a view of our normalized gaming of about $5 billion stretched over 2 quarters. Yes, there is always some seasonality. So sometimes, it's going to be $2.5 billion a quarter, give or take, depending on the quarter leading in. We still see gaming is solid, and we're continuing to watch each and every day in terms of the sell-through that we're seeing, particularly as we are looking at the Western holidays right now in that time. So we have been undershipping. We have been undershipping gaming at this time so that we can correct that inventory that is out in the channel. And as we discussed, we plan, hopefully, by the end of Q4, as we approach the end of Q4, that we will be in a solid position to that. That means as we move forward, we will start to get back up. We'll get to some point of an equilibrium between sell-through and sell-in. And then we will likely get to where we'll be selling in to build the channel for our Ada launch and all of the additional Ada products that we will see coming to market.”

Advanced Micro (AMD) on Server markets…. “So what you're seeing is the market is growing so dramatically. It's drawing new competitors in, and everyone is looking for their niche. And that's where you're going to provide -- if you can provide a niche where you're really tailoring to a specific workload, then you can drop out circuitry not needed for other workloads and have a more economic solution. So it really, Aaron, was a driving force in us expanding the offerings that we have. One, what I talked about earlier, positioning Genoa, with such strong performance, on top of Milan. So that gives us flexibility of price over that broad range of offerings that we have from Genoa, from fourth-gen EPYC, inclusive of third-gen EPYC. But also, again, with Bergamo coming with that dense core in first half of 2023 is also intended to give us that TCO advantage. People don't buy on just pure price. They're looking at the total cost of ownership, and they're looking at the total cost of ownership for their workload. So the way we're attacking price is making sure that we have the configurations that are tailored to the workloads our customers are running and are priced to give them significant total cost of ownership advantage.”

Marvell (MRVL) on areas of weakness and cloud spend… “So on the first one on nearline, as you mentioned, there's been a lot of reports out there about the weakness there. We really hadn't seen that when we guided the quarter. In Q3, we started to see some weakness, but the impact is very pronounced in the fourth quarter, and that nearline weakness obviously flows into the data center end market into that bucket. When you go to China and the weakness we've seen there, that's really in the enterprise area. So while overall enterprise is hanging in there, it was slightly below in Q3. We've had some offsets to that from strength elsewhere. But the main impact of the Chinese customers has really been an enterprise for the most part. So first point would be that if you look over the last few years, cloud CapEx has been on fire. It's been growing 30% kind of plus for the last few years. This year, if you look at reports and kind of what we see is probably something in the 15%

range for '22 and then it depends on who you talk to, but probably down in the low to mid-single digits or maybe mid-single digits for next year. So that's the deceleration that we're talking about. And as the macro has started to catch up even with these large cloud companies, you see them very publicly tightening their CapEx, tightening their OpEx. And they've had this supply chain built in the data center, which was geared up for a lot of growth. And so as they reset those expectations, it's not a real smooth process. Storage is the most pronounced, as I mentioned earlier. That's the majority reason code for the sequential decline. But we are seeing inventory adjustment as well to a much lesser extent, and I'd say the broader set of product lines outside of storage that we sell into data center."

OptionsHawk Executive Summary & Focus Stocks

This is a tough group to analyze, **Nvidia (NVDA)** is the quality name by a landslide but in the midst of a nasty downward revision cycle and trades extremely rich at 40X EBITDA and 79X FCF. **Intel (INTC)** remains a value trap and continues to lose market share while **AMD** has already seen its multiple compress and may start becoming a value name once the cycle bottoms. **Marvell (MRVL)** the preferred name for 2023 at fair valuation with a healthier growth outlook and operates at solid margins, also seeing the smallest negative revisions. The small caps have two name of interest with **MACOM (MTSI)** at 14X FCF showing durable growth and strong profitability. **Credo (CRDO)** is more of a story stock at wild valuation but seeing rapid growth as a leading provider of high-speed, low power data connectivity solutions with a broad product portfolio that addresses every connection in the enterprise and hyperscale data center markets.

<u>Semiconductors – Industrial, IoT & Auto</u>

Components: AVGO, TXN, ADI, NXPI, MCHP, STM, ON, MPWR, WOLF, ALGM, SLAB, POWI, DIOD, VSH, SMTC, INDI, MX, SKYT

International & Private Peers: Infineon

Intro

Chip stocks will no question face headwinds in 2023 and will likely be a bit of a transition year with 2H23/2024 potentially a brighter situation that could attract investors into the names mid-year. The group overall remains attractive with high profitability, high barriers to entry and leverage to key megatrends in Tech. Reshoring and CHIPS Acts provide tailwinds for semicap equipment names. EV's are a positive growth driver with chip content doubling. Consolidation in semis over the past decade coupled with megatrends and high entry barriers is enabling stronger for longer pricing trends, with strong conversion and return of free cash flow.

Automotive semis have the strongest growth prospects (13% CAGR from CY21-24E) relative to nearly all other markets. Interestingly, per Gartner, auto semis have potential to grow at a 12% CAGR through the decade, well above historical semis growth (mid-single digits). Autos benefit from a multitude of factors (government mandates, green energy initiatives, increased connectivity/digitalization of driving experience) that are driving strong content opportunities. Per Strategy Analytics, semi content per vehicle will grow at a CAGR of 10.7% from '21-'26E, from a $571 global avg in '21 to $948 in 2026E. Per Gartner, government mandates for advanced safety capabilities in new vehicles along with increasing consumer adoption will push ADAS demand to $24.8bn in '26E from $9.4bn in '21 and $12.6bn in '22E (key participants include NVDA, AMBA, NXP, QCOM, etc.), with Qualcomm edging for a larger piece of the pie. QCOM estimates ADAS and AD combined to have a TAM of $59bn currently, and Infineon projects the TAM will reach $100bn further on.

Industry Backdrop & Investment Considerations

The “semiconductor cycle” refers to the ebb and flow of supply and demand and the building and depleting of inventories. The semiconductor market historically has been characterized by periods of tight supply caused by strengthening demand and/or insufficient manufacturing capacity, followed by periods of surplus inventory caused by weakening demand and/or excess manufacturing capacity. These are typically referred to as upturns and downturns in the semiconductor cycle. A semiconductor cycle could be affected by the significant time and money required to build and maintain semiconductor manufacturing facilities.

Growth in the global semiconductor industry has traditionally been driven by the consumer market. Looking ahead, industry growth is expected to be driven by technology mega trends in the automotive and industrial markets. These mega trends have created requirements for new technologies in vehicles, both under the hood and in the cabin, to support vehicle electrification and advanced driver assistance systems. These shifts also require technology to enable intelligence and automation in factories and to enable energy efficiency in data centers and green energy applications. According to industry experts, these mega trends are expected to dramatically increase the demand for sensing and power solutions. The advent of Industry 4.0, increasing demand for renewable energy and the adoption of green technologies represent additional meaningful growth opportunities for chip companies.

The Automotive segment is comprised of cockpit infotainment solutions, AV platforms, and associated development agreements. Growth in automotive semiconductor sales relies on global vehicle sales and production trends and the increase in semiconductor content per vehicle, which is being driven by the proliferation of electronic features throughout the vehicle. Semiconductor content per vehicle continues to increase due to government regulation of safety and emissions, standardization of higher-end options across a greater number of vehicle classes as well as consumer demand for greater fuel efficiency, advanced safety, multimedia applications and connectivity.

Automotive is a massive opportunity with several megatrends developing across Connected Card and ADAS. According to IC Insights, the automotive and transportation market for integrated circuits in 2019 was $35 billion and is forecasted to grow at 8.5% annually for the next five years, with the analog sub-category growing 10.2% annually over the same period. Growth will be driven by the increasing amounts of customer-specific semiconductor content per vehicle to enable trends in connectivity, electrification, advanced driver-assistance systems concepts and autonomous driving.

Silicon Carbide presents an intriguing new opportunity for auto-semi evolution. Compared to Si, SiC allows for higher voltages, temperatures, switching frequencies, and current carrying capability, and thus lighter, smaller, and cheaper components. Per, WOLF, the value of SiC content per vehicle could grow more than 4x over the next 5 years.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, P/E

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Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Industrial, IoT and Auto											
AVGO	Broadcom Inc	236.9B	12.21X	7.51X	14.69X	3.68%	3.72%	61.12%	49.13%	15.17%	9.75%
TXN	Texas Instruments Incorporated	154.3B	13.72X	7.66X	24.60X	-7.75%	-14.97%	48.84%	34.31%	1.36%	0.52%
ADI	Analog Devices, Inc.	84.6B	13.29X	7.36X	19.56X	3.73%	2.42%	49.44%	31.43%	17.58%	8.73%
NXPI	NXP Semiconductors NV	42.8B	9.55X	3.83X	18.74X	-2.46%	-8.05%	32.91%	19.39%	10.82%	3.87%
MCHP	Microchip Technology Inc	40.0B	11.28X	5.61X	16.92X	-0.89%	-5.42%	43.47%	36.25%	31.93%	23.32%
STM	STMicroelectronics NV (ADR)	34.3B	6.01X	2.07X	36.73X	0.64%	-11.07%	18.96%	9.31%	94.17%	26.21%
ON	ON Semiconductor Corp	27.8B	8.79X	3.44X	17.67X	-3.22%	-13.02%	21.93%	19.84%	26.75%	8.48%
MPWR	Monolithic Power Systems Inc	17.5B	23.26X	9.35X	49.67X	9.96%	9.83%	32.38%	18.61%	72.03%	50.56%
WOLF	Wolfspeed Inc	9.8B	95.17X	9.90X	-10.66X	45.14%	#VALUE!	-11.77%	-107.85%	-57.26%	36.67%
ALGM	Allegro MicroSystems Inc	5.9B	17.98X	5.87X	31.59X	7.25%	5.68%	23.18%	11.21%	52.56%	24.83%
SLAB	Silicon Laboratories Inc	4.6B	16.11X	3.66X	32.25X	2.25%	-29.03%	9.72%	-17.90%	69.94%	2.59%
POWI	Power Integrations Inc	4.2B	15.62X	5.83X	19.50X	-4.63%	-19.46%	30.70%	26.11%	-11.67%	-15.66%
DIOD	Diodes Inc	3.7B	7.06X	1.85X	14.63X	-1.34%	-5.37%	16.40%	10.93%	43.74%	2.31%
VSH	Vishay Intertechnology Inc	3.1B	3.40X	0.74X	9.14X	-0.16%	-16.99%	3.81%	7.37%	26.17%	3.12%
SMTC	Semtech Corp	1.8B	7.12X	2.23X	7.73X	-10.86%	-18.84%	27.37%	23.88%	-16.82%	-11.51%
INDI	indie Semiconductor Inc	1.0B	-14.65X	7.79X		101.03%	-65.97%	-85.43%	-123.71%	-7.69%	132.19%
MX	Magnachip Semiconductor Corp	0.4B	5.81X	0.44X	6.87X	4.19%	102.17%	11.84%	11.58%	-67.37%	-31.18%
SKYT	Skywater Technology Inc	0.4B	240.41X	2.13X	14.91X	22.31%	-67.55%	-22.38%	-53.83%	-9.23%	1.98%

Management Commentary

TI (TXN) on Semi cycles… "And in general, we do -- we never ignore the cycle. We watch it, but we do spend 90%, 95% of our time on how to get prepared for the next opportunity or looking beyond the cycle, especially with many of the actions we take, they have long lead time in terms of how do they convert the results. So if you think about getting capacity in place, getting our inventory in the right levels, that's where I spend a lot of my time and not ignoring the cycle, watching it, but it's going to do what it wants to do. We have to think beyond that, and that's where the energy of the company is, it has to be. Specifically, the cycle has been in some ways different because maybe not all markets are behaving the same. And we've seen PE and notebooks, so personal electronics and notebooks starting in Q2, they've talked about, we are seeing spreading weakness in industrial into Q3. And then automotive is still holding, but I'm not going to try to predict what it's going to do and when. But my high-level view is that they're usually correct. I will also say that our position in Industrial and Automotive has been stronger than it ever was. We finished 2021 at above 60%. So again, as I said, our eyes on what it can do in 2025, 2030 and getting the company ready for that opportunity."

NXP Semi (NXPI) on resilient demand…. "While at the very same time, we do see very, very strong resilience in demand in automotive and core industrial. And that goes to the extent that in automotive and core industrial, we continue to be sold out. So the very long lead times of 70% of the portfolio is actually coming largely from core industrial and automotive. When we look at our NCNR orders, which are being placed in those two sectors, for next year, for the next full calendar year, it also shows that we will continue to be sold out. We see about a 85% coverage level of demand with our supply capability for next year. And mind you, the supply capability is improving gradually quarter-to-quarter. So there is a growth in demand, growth in supply, but still in that part of our business, which is the much larger part for NXP, we continue to be sold out where, indeed, at the same time, we do have that softness in the consumer mobile and compute markets. Because the demand trends in those two different legs are having very different origins. I believe that the surge in demand for the compute, mobile, and consumer markets was really a function of the working from home through the pandemic. While the demand in automotive and core industrial had actually not really anything to do with the pandemic, it is a secular trend. It is about content increases in electric cars with ADAS in factory automation, which was not accelerated by the pandemic at all."

Microchip (MCHP) on Analog industry…. "We tend not to want to make a call on the industry but speak to our own business. And we know that we are still very supply constrained. We know that we have several capacity corridors that will continue to be constrained all the way through 2023. We do about 40% of our production in-house in our wafer fabs, as I think I mentioned, that other 60% we are reliant on the professional foundries for. And some capacity is freeing up at foundry with weakness that is seen and end markets that we don't really play in, cell phone, consumer PC. It's freeing up some capacity. But the challenge is that capacity has to be a perfect match for the foundry and the process technology node where we are in short supply. And things have gotten better, but there's still some capacity corridors that are very tight. And I think that extends it. And so I think that's maybe the difference that some in the industry are seeing. Some of it is driven by end market exposure. We have only about 14% consumer exposure, and most of that is actually in the home appliance market, where there's always a refresh cycle. Yes, housing starts are down. That is the weakest part of our business. But the other 86% of our business is industrial, aerospace and defense. That's about 40% of our business in total, those markets; data center, automotive. Those are our 3 largest markets. Those are all doing well. And then communications is the other piece of it."

OptionsHawk Executive Summary & Focus Stocks

Auto is an attractive end-market with all the increased content coming to automotive with the EV penetration. There are some very large names in this group with **Broadcom (AVGO)** the largest and I feel every year I am talking about it as best-in-class as it offers solid growth, leading margins and at cheap valuation, and no change there this year, just a fantastic long-term own. **Monolithic Power (MPWR)** is a valuation short at 23x EBITDA and 50X FCF despite it showing more durable growth and upward revisions, that can change quickly and compress its multiple. That leaves six other large caps that all trade close in valuation, but **Analog Devices (ADI)** is the clear best-in-class name of that grouping. **NXP Semi (NXPI)** would fall into the out of favor value buy bucket and if there was to be a large M&A deal in Semis, I feel NXPI is the name acquired. **Allegro Micro (ALGM)** screens as the clear best name of the smaller cap plays with durable growth and upside estimate revisions, a winner of the secular growth auto themes. **Wolfspeed (WOLF)** is an interesting growth story in silicon carbide but remains a very long-duration name trading at sky-high valuation. **POWI** looks to be the short of the group. Lastly, of the very small names **Semtech (SMTC)** a potential M&A target with cheap valuation and strong economics.

<u>Semiconductors – Consumer Electronics & RF</u>

Components: QCOM, SWKS, QRVO, LSCC, OLED, CRUS, SYNA, MXL, AMBA, HIMX, AOSL, XPER, AKTS

International & Private Peers: Novatek, Samsung, SiliconWorks, Raydium, MediaTek, Sitronix, FocalTech, Fitipower

Intro

PC and Smartphones have been ground zero for weakening demand and building inventories. Apple is likely to be the larger swing factor between now and the spring of 2023, as any minor/negative deviation in sell-through relative to the company's internal plans could drive an out-sized correction in component procurement given current/elevated inventory levels. RF company inventory dollars increased 4% Q/Q in 3Q22, in line with typical seasonality of +4% Q/Q and are now 37% above the trailing three-year average. Android volumes came in weaker than expected for both SWKS/QRVO in the latest quarter. Global 5G handsets are now indicated at about 600M units versus 700M to start the year. Broadcom recently reported and saw strength in Broadband and Networking chips as well as Wireless content growth. AVGO is also seeing share gains in next-generation storage solutions in both the cloud and enterprise market. For QCOM, the focal point of 4Q was global handset demand deterioration and elevated channel inventory, largely among Android devices. Samsung signaled CY23 capex could be flat to up YoY, unlike memory peers MU/Hynix cutting by 50%+.

Industry Backdrop & Investment Considerations

Consumer Electronics include smartphones, tablets, wearables, desktops, notebooks, and other handheld products, wireless charging, set-top boxes, digital televisions, monitors and displays, digital video recorders and other consumer equipment.

The growth of the power semiconductor market in recent years has several key drivers. The proliferation of computer and consumer electronics, such as notebooks, tablets, smart phones, flat panel displays and portable media players created the need for sophisticated power management to improve power efficiency and extend battery life. The evolution of these products is characterized by increased functionality, thinner or smaller form factors and decreasing prices. Display drivers is another segment with image processing technologies with tablets and automotive growing quickly.

Ubiquitous internet connectivity has driven exponential growth in data content, delivery, distribution, and consumption. These trends are seen continuing due to the rapid rise of social media and real-time content, proliferation of OTT video services, rapid growth in the data center and cloud-services, the remote economy, IoT and the advent of broadband 4G/5G wireless mobile connectivity.

Computer Vision is another emerging trend. Computer vision functionality has historically been executed with graphics processing units (GPU), field programmable gate-arrays (FPGA) or general purpose microprocessors (CPU) in servers or datacenters. This approach requires large amounts of data to be transported from an end-point electronic system or device into the network infrastructure, where the data may be stored, processed, and then sent back to the end point, creating added delay, power consumption and incremental expense from data communications, server processing and storage.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, P/E

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Consumer Electronics and RF						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
QCOM	Qualcomm Inc	130.8B	9.01X	3.46X	10.34X	12.10%	18.97%	38.61%	15.46%	-13.60%	-5.00%
SWKS	Skyworks Solutions Inc	15.0B	7.43X	3.27X	7.47X	8.51%	9.85%	37.28%	16.68%	-13.75%	-9.63%
QRVO	Qorvo Inc	9.8B	11.48X	2.99X	13.22X	2.45%	3.93%	33.40%	17.99%	-49.14%	-20.98%
LSCC	Lattice Semiconductor Corp	9.6B	43.11X	14.65X	46.67X	11.45%	15.73%	30.23%	30.64%	71.57%	29.91%
OLED	Universal Display Corporation	5.3B	16.20X	7.68X	31.70X	6.09%	3.17%	41.13%	26.66%	-13.29%	-6.35%
SYNA	Synaptics, Incorporated	3.9B	6.45X	2.58X	11.60X	7.45%	8.54%	37.47%	23.08%	-23.38%	-12.07%
AMBA	Ambarella Inc	3.3B	55.68X	9.25X	62.84X	3.43%	-37.50%	18.95%	8.77%	-41.38%	-13.07%
MXL	Maxlinear Inc	2.8B	6.85X	2.49X	7.34X	2.71%	-1.85%	27.09%	9.13%	13.72%	4.73%
HIMX	Himax Technologies, Inc. (ADR)	1.2B	5.06X	1.20X		-14.12%	-56.35%	37.38%	24.58%	-50.00%	-24.60%
AOSL	Alpha and Omega Semiconductor Ltd	0.8B	4.15X	0.76X		6.12%	21.10%	17.70%	10.40%	-29.09%	2.07%
XPER	Xperi Inc	0.4B	-369.42X	0.48X	-14.61X	7.35%	-96.51%	-4.73%	-6.69%	118.75%	-0.38%
AKTS	Akoustis Technologies Inc	0.2B		6.49X		98.37%	-38.10%	-394.50%	-524.39%	6.18%	65.80%

Management Commentary

Qualcomm (QCOM) on diversifying the company…. “So you know when Cristiano became CEO about 1.5 years ago, even before that, we were, obviously, focused on diversification. But one of kind of the key changes he made to the focus of the company going forward is really transition from a connectivity chip company for the phone to a connected processor company for the edge. And so it's a fundamental transition, not just from how we position the company externally, but really how we operate internally, how we make investment decisions and like. And so the premise is being -- as everything gets connected to the cloud, we have the ability to take the technologies we had created for the phone and apply it to other industries. And so the premise of the diversification plan is very simple. And if you look at automotive, clearly, the industry is going through a once-in-a-lifetime transition in various ways. And the technologies we have in phones become extremely relevant to the auto industry. You look at broader IoT opportunity within consumer edge networking, industrial, the same trend applies, right? And digital transformation, obviously, a very big deal right now. And it's almost like with the macro environment becoming more challenging, digital transformation is actually a tailwind and transitioning from a technology perspective is becoming even more important for industries to survive and thrive. And so we're in this unique position where we happen to have a technology portfolio that's extremely relevant to a bunch of industries, and the plan -- diversification plan is really based on taking that and applying it to different areas. So that's the framework.”

Skyworks (SWKS) on its markets…. “Well, overall, I think the opportunity for growth is still very much in sync here for us. The technology and the burden of technology has never been higher now. So we continue to see more complexity in the device. Obviously, Mobile is a big driver for us, but we're also seeing IoT nodes blossom, doing a lot more in the Broad Markets business, and a great setup going into 2023 despite some of the headwinds that we're seeing across the globe that we all know about. We've never been more diversified. The I&A business that we acquired has been running incredibly well. We're scaling that. Our Bulk Acoustic Wave technologies are growing right now and capturing more and more technology as well with the larger customers. So we feel really good about it, but the market, of course, is a little bit bumpy. As you know, we're a company that does a lot of our work inside. We have our own fabs, our own labs, and we craft our solutions one account at a time. So there's a lot there, but we feel really good about the opportunity as we go forward. The derisking of China has happened already. So there's no downside for us. It's only upside from here in that end. And then also continuing to push 5G into other markets. So I'd like to always tell investors, think about 5G as a technology, not a product. It's a technology that can go into an automobile. It can go into an IoT position. It can go into a mobile phone. And that's what we want to be able to do and create that usage case, right, and embody usage cases for our customers, so that they can do more flexible things.”

Qorvo (QRVO) on Android growth…. “The Android ecosystem today, only about 40% of that is 5G. Where on the iOS, it's 100% 5G. So, when we look at the opportunities for growth, we see that as significant growth. So we expect it to get to about 60% of the Android ecosystem to be 5G in a few years. So that's a tremendous number of units of growth. And we get somewhere between $5 and $7 worth of opportunity for us in added content. So, that's a big growth driver for us. I know there's a lot of concerns about the Android ecosystem. And as we look at things out there, from a 5G perspective, we started the year thinking it was going to be over 700 million units, now we're closer to 600 million units. Okay. Clearly, what's impacting that is the shutdowns in China. But we view these as temporary not a structural change in the outlook that we have and the opportunities. And you mentioned MediaTek, that's a great example where during this time, we're seeing tremendous opportunities to lock in future wins. Feel good about that. We also talked on the call about we want a low-band pad in a marquee phone at Samsung. That's a major milestone for us. We've never had that opportunity before. So we're continuing to see great growth at Samsung. We also said we're going to do well at Honor. That's continuing to ramp. Google is another great opportunity for us along with the rest of the Vivo, Oppo, Xiaomi in China. So, feel good about where we're positioning the business there. So, if I also step back and then look at the long-term growth drivers of our business, as I stated, 5G is clearly one. The migration from WiFi 6, 6E to WiFi 7 is added content for us as well. That looks great, the continuation of defense funding, growing and supplementing. Philip's business, we're seeing the rollout of 5G infrastructure in India, which, again, Philip's business is positioned extremely well. I look at what's going on with ultra-wideband, the work we're doing there and matter. So, we see a lot of opportunities for growth as we look forward."

Lattice Semi (LSCC) on its differentiation and markets…. "So we focus on small and midrange FPGAs, of which the small is about a $3 billion market opportunity for us, and the midrange is about another $3 billion market opportunity. And that's really the biggest difference between us and the competition, is they're focusing on really much larger FPGAs for different sets of applications than what Lattice is focusing on. So I talked about in the very beginning that back in 2018, we set out to build the strongest product portfolio within Lattice, its history. But also we set out to even focus on the right core markets. If you go back to that time period back in 2018, 1/3 of our revenue came from consumer. Today, 90% of our revenue is coming from comms and compute and industrial and automotive. These are our core strategic markets that we focus on. So 90% is coming from those markets. And within those markets now, we're very well positioned on good secular growth applications within each one of those markets. So if you think about the communications markets, we're well deployed across the top OEMs on 5G. So anything that's related to 5G, growth within 5G, we benefit from that. If you go into the compute portion of our end markets, we're strong in the server, as well as we're starting to ramp up in client devices. On the client side of it, think about notebooks and PCs. Although this isn't the sexiest market right now, everybody is talking about declines in the PC market. But from a Lattice perspective, this is a greenfield opportunity and a growth driver for us as well. A lot of what we did on the server market and finding applications in a server and driving the attach rate also applies to notebooks and client devices well. And then you've got the industrial and automotive. And in our last quarter, we had a 45% growth year-over-year in our industrial and automotive, and it's on track for its third consecutive year of double-digit growth. And our FPGA is just a really, really good fit for factory automation, robotics and those types of applications in industrial. And in the automotive market, a lot of what we do, whether it be in industrial, communications, I mean, it applies to the automotive market as well. And we've qualified our FPGAs for automotive applications, and we're seeing good growth in the automotive market."

OptionsHawk Executive Summary & Focus Stocks

The lousy consumer electronics backdrop makes this a much more difficult group to be long in 2023. **Qualcomm (QCOM)** is the best-in-class name while **Qorvo (QRVO)** screens as a short and **SkyWorks (SWKS)** a deep value buy. **Lattice Semi (LSCC)** is in a league of its own with impressive growth and FCF margins along with rising estimates though carries a premium valuation. **Synaptics (SYNA)** screens very cheap and a potential M&A target for a buyer looking to time a cycle-bottom. **Alpha and Omega (AOSL)** is one of the best values at 4.2X EBITDA and 0.76X EV/Sales.

Semiconductors – Semiconductor Services

Components: ASX, CGNX, AMKR, NOVT, IPGP, MKSI, COHR, ONTO, NVMI, COHU, FORM, UCTT, PLAB, CAMT, VECO, IMOS, ICHR, AEHR, LASR, ACMR, AXTI

International & Private Peers: Dai Nippon Printing, SK-Electronics, Toray, ASTI Holding, Skyverse

Intro

This group includes a hodgepodge of smaller market cap niche providers of services along the semiconductor production cycle which includes Fluid Delivery Systems & Cleaning (ICHR, UCTT, ACMR, MKSI), Test, Inspection, Metrology, Handling & Packaging (NVMI, ASX, COHU, CAMT, FORM, ONTO, AMKR), and Machine Vision & Lasers (LASR, CGNX, IPGP, COHR, NOVT).

This group has seen plenty of weakness in 2022 with laser demand often tied to PMIs and Industrial activity as well as cost pressures. Struggles are likely to continue through 2023 with a software Semiconductor environment for the service providers in the production cycle while there are some positive tailwinds from expanding capacity in the US with reshoring.

Industry Backdrop & Investment Considerations

EDA software is a $12bn market growing at 6%, focusing on designing electronic components like circuit boards and integrated circuits that is present in anything electrical. Key players include Cadence Design Systems, Synopsys and Siemens (through acquisition of Mentor Graphics). Growth drivers for EDA include electrification and autonomous driving in Autos, more IoT connected devices in industrials and more complex hi-tech devices over time.

Fluid Delivery target markets are defined below and are included within the broader group trend of more outsourcing. By major equipment segment, Gartner estimates a 2020 global market size of $3.5 billion for wafer cleaning equipment (auto wet stations, single-wafer processors, batch spray processors, and other clean process equipment), $2.4 billion for furnace equipment (tube CVD, oxidation/diffusion furnace, and batch atomic layer deposition), and $546 million for ECD (electro-chemical deposition). Based on Gartner's estimates, the total available global market for these equipment segments increased by 15% from $5.6 billion in 2019 to $6.4 billion in 2020 and is expected to increase by 6% to $6.8 billion in 2021. Geometries are becoming far more complex requiring faster etch rates, more control and higher development/production costs. This is leading to more fluid delivery content per system and increased etch and deposition intensity at each node transition. Use cases continue to rise for Lasers, a $10B market.

Indicators, Metrics & Stock Selection Framework

EV/Revenues, Revenue Growth, P/E

Unit Shipments, ASPs, Gross & Operating Margins, R&D and SG&A Cost Trends, Days Sales Outstanding, Inventory Days, and Debt Ratios are other key metrics for assessment.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Semi Services						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
ASX	ASE Technology Holding Co Ltd (ADR)	13.7B	134.58X	25.43X		0.39%	-14.12%	10.90%	1.54%	14.90%	8.55%
CGNX	Cognex Corporation	8.5B	28.86X	7.97X	39.12X	0.47%	6.43%	34.60%	28.79%	-24.26%	-13.65%
AMKR	Amkor Technology, Inc.	6.3B	4.37X	0.93X		-0.09%	-0.83%	12.44%	5.56%	31.21%	16.08%
MKSI	MKS Instruments Inc	5.4B	10.61X	2.75X	22.80X	6.96%	-13.63%	26.96%	18.74%	-18.94%	17.46%
NOVT	Novanta Inc	5.2B	30.16X	6.44X	50.13X	5.68%	12.45%	16.54%	10.56%	3.40%	2.65%
COHR	Coherent Corp	4.8B	7.35X	2.05X	-537.26X	7.36%	15.95%	19.60%	2.98%	5.04%	67.53%
IPGP	IPG Photonics Corporation	4.5B	7.95X	2.32X	15.84X	1.09%	-0.03%	25.18%	18.25%	-4.71%	-7.08%
ONTO	Onto Innovation Inc	3.6B	9.82X	3.03X		-13.02%	-24.92%	27.82%	20.69%	40.69%	28.73%
NVMI	Nova Ltd	2.5B	11.03X	3.77X		-8.21%	-25.28%	30.36%	30.63%	31.76%	37.23%
FORM	FormFactor, Inc.	1.8B	11.48X	2.10X	11.49X	-9.04%	-49.75%	19.87%	9.47%	-21.29%	-3.39%
COHU	Cohu, Inc.	1.6B	7.16X	1.66X		-7.34%	-19.69%	20.52%	9.66%	1.01%	-8.33%
UCTT	Ultra Clean Holdings Inc	1.6B	5.47X	0.70X		-14.91%	-36.15%	12.24%	7.25%	-2.36%	16.10%
PLAB	Photronics, Inc.	1.1B	3.03X	1.13X		3.26%	5.30%	25.69%	19.73%	22.26%	5.97%
CAMT	Camtek LTD.	1.0B	8.51X	2.55X	13.94X	-9.74%	-24.04%	28.45%	21.06%	17.03%	19.48%
VECO	Veeco Instruments Inc.	1.0B	8.95X	1.52X	83.95X	3.80%	-13.58%	14.85%	4.65%	-6.54%	12.24%
ICHR	Ichor Holdings Ltd	0.8B	7.12X	0.82X		-16.54%	-35.78%	10.66%	-0.51%	13.12%	19.42%
IMOS	ChipMOS Technologies Inc - ADR	0.8B	3.56X	1.20X		-7.94%	-26.69%	20.30%	5.25%	-16.04%	-12.44%
AEHR	Aehr Test Systems	0.6B	39.79X	8.91X		49.58%	97.96%	21.10%	2.15%	25.58%	33.63%
ACMR	ACM Research Inc	0.5B	5.92X	0.87X		10.05%	-25.26%	16.87%	-19.17%	18.78%	-2.70%
LASR	Nlight Inc	0.4B	-205.03X	1.38X	-67.19X	-2.29%	30.85%	3.77%	-10.74%	500.00%	-17.93%
AXTI	AXT Inc	0.2B	9.22X	1.95X	-1.51X	-3.75%	-10.78%	9.39%	-23.98%	9.09%	5.42%

Management Commentary

Amkor (AMKR) on its markets….“Main drivers there were actually outperformance of the communication market, where we saw good strength in the launch of premium Tier 5G smartphones where we hold a good position. We were extending our market share in that part of the communication market, both on the iOS ecosystem as well as on the Android ecosystem. Overall, we see the smartphone markets declining slightly in this year's single-digit decline. But in the high-end premium tier smartphones, we see still see growth certainly on the semiconductor content. We believe that the supply chain situation in automotive is normalizing, and that helps us further growth. In the compute segment, yes, we see some weakening in the PC market, certain segments there, we see inventory buildup. But in our presence in that market, specifically tuned towards the infrastructure, networking infrastructure as well as data centers, we still see strength. And then the fourth segment is the IoT markets, IoT wearables, specifically, we saw the launch of 2 new product generations, and that helps us to push that business up. So overall, we were pretty happy with our performance across all market segments. And one thing to note is our outperformance in advanced packaging. Our advanced packaging portfolio grew to 70% of our business, which is an all-time record in this quarter. Mainstream business is still doing well. It's very much tuned to wire bond business in automotive, but advanced packaging across all market segments outperformed in the quarter.”

Nova (NVMI) on demand drivers and industry backdrop… “We now see 3 to 4x as many applications running on our tools as we did just 5 years ago. As a result, Nova's materials metrology solutions are moving from in fab, meaning couple of tools in a certain fab, to a complete in-line high-volume manufacturing process control tools. As we turn to packaging, we see clear indications that manufacturers are beginning to view advanced packaging as part of the front-end wafer fabrication process. As a result, the demand for stability, yield and quality is growing, and the utilization of metrology tools is increasing. In the advanced packaging domain, design is evolving from [fan-out] to 3D designs, creating numerous combinations and new substrate materials. This creates more variation of chemistries than ever before. We are carefully monitoring the market dynamic, which is now driven not only by supply and demand schemes, but also by some trade restrictions and financial sensitivity in the market. We should expect some volatility in the demand scheme through the next few quarters mainly by the weakness of the traditional drivers like the PC and mobile, which impact memory supply and prices. We still believe in the industry's secular growth and strong long-term structural demand drivers. The first one as charted on the left in the slide relates to the demand driven by the accelerated digital transformation, which boosts several drivers that will continue growing in the next few years like IoT, automotive, AI, high-performance computing and data management infrastructure.”

MKS Instruments (MKSI) on impact of WFE expected -20% in 2023…. “So at a high level, pro forma combined company, our semiconductor revenue is about 45% of total revenue. And then when you pull out the services business of that 45%, which is much more resilient, much more stable. As your previous speaker had talked about in service, there's a lot of spares and replacements and repairs. It's really nice service and driven by consumption and production. So if you pull out service, the actual equipment to WFE, what we provide is maybe 40% -- just under 40% of overall revenue. And so we continue to drive growth, for example, in 3D NAND. We enable every leading-edge 3D NAND node in the world today with our RF power. And as you get to higher layer counts, that's more chambers and that's more power content per chamber. So those are the things that we really like. But also in addition to technology, R&D scale is very important. Operational scale is very important because what the semiconductor industry and our customers want is they want someone who can scale with them, who can grow with them. And that's exactly what we've done. So I think in semi, it's a market that we are very excited about.”

Cognex (CGNX) on its optimism…. "There are several reasons for our confidence. First, Cognex customers include many e-commerce and omnichannel retailers that are early in their adoption of machine vision. Second, we believe more growth collectively will come from Europe and Asia than the Americas. Third, there are other market adjacencies in logistics, such as parcel and post, where we have a small presence today and superior solutions that position us well to grow. And lastly, we see many applications beyond barcode reading where our machine vision technology is increasingly being used to solve new problems in logistics fulfillment. We believe that logistics will continue to be an important growth driver for us. It has emerged as the largest, and we expect it will remain the fastest-growing sector in our served market. We estimate the logistics segment to be a $2 billion market growing by 20% long term. Our differentiated technology and the opportunities we see in logistics gives us confidence we can continue to be a share gainer and grow this part of our revenue by 30% over the long term. At Analyst Day, we introduced an updated view of our served market. The new estimate is $6.5 billion, up 55% from our previous estimate of $4.2 billion that we shared with you in 2019."

OptionsHawk Executive Summary & Focus Stocks

Of the $5B and higher market cap names **Novanta (NOVT)** screens most attractive though carries a rich multiple and the same can be said of **Cognex (CGNX).** Overall this is a slower growth and lower margin group so not overly excited for longs. **Coherent (COHR)** is a value play I recently profiled and as it works through the IIVI acquisition should re-rate higher. ONTO/NVMI are two names of high quality but entering a sharp decline in EPS/Revenues, so patience is needed. **Photronics (PLAB)** screens as the best small cap at cheap valuation with forward growth positive, upward revisions and strong margins. Those qualities may also make it an acquisition target as demand trends are very strong. Lastly, **Aehr (AEHR)** is an exciting small cap profiled earlier in 2022 as a silicon carbide play.

<u>Communications – Telecom</u>

Components: VZ, T, TMUS, VOD, BCE, ORAN, TU, TEF, RCI, SKM, MBT, PHI, KT, USM, SHEN, TDS, DISH, AMX, ASTS, ATEX, CNSL, VIV

International & Private Peers: China Mobile, Nippon Telegraph, Saudi Telecom, Bharti Airtel, Telstra, MTN Group, SK Telecom, KDDI

Intro

Telecom offers attractive valuations with defensive qualities and high dividend yields but cost pressures have weighed on results at T/VZ while TMUS continues to excel. Consumer demand in broadband remains strong and the launch of the iPhone 14 is now in focus. Enterprise and B2B demand are showing more signs of weakness than consumer though Data Center operators reported strong bookings and robust demand pipelines. Rising interest expenses remain a drag on results and productivity improvements are needed to offset the cost pressures along with price increases. Strong subscriber growth is supporting solid service revenue growth for the wireless industry. While subscriber growth is the largest contributor, wireless average revenue per user (ARPU) is also rising at AT&T and T-Mobile (TMUS) after long periods of decline (particularly at TMUS). Increased data usage, migration to higher-tier plans, the return of international roaming revenue, price/fee increases, and lapping promotional contra-ARPU headwinds are all driving ARPU growth.

Verizon spoke to accelerating store traffic exiting 3Q and expects pricing related churn to moderate, while AT&T continues to point to a healthy demand environment. T-Mobile raised their postpaid net add guidance for the year once again, while the cable companies pointed to accelerating growth. Several factors are helping drive modest improvements in ARPU with AT&T reporting a 2.4% y/y increase in postpaid phone ARPU for example. Higher adoption of premium unlimited plans, a rebound in roaming revenues and selective price increases are all playing a role. Smartphone upgrade intentions are mixed for '23, with China down Y/Y, but US up Y/Y.

Industry Backdrop & Investment Considerations

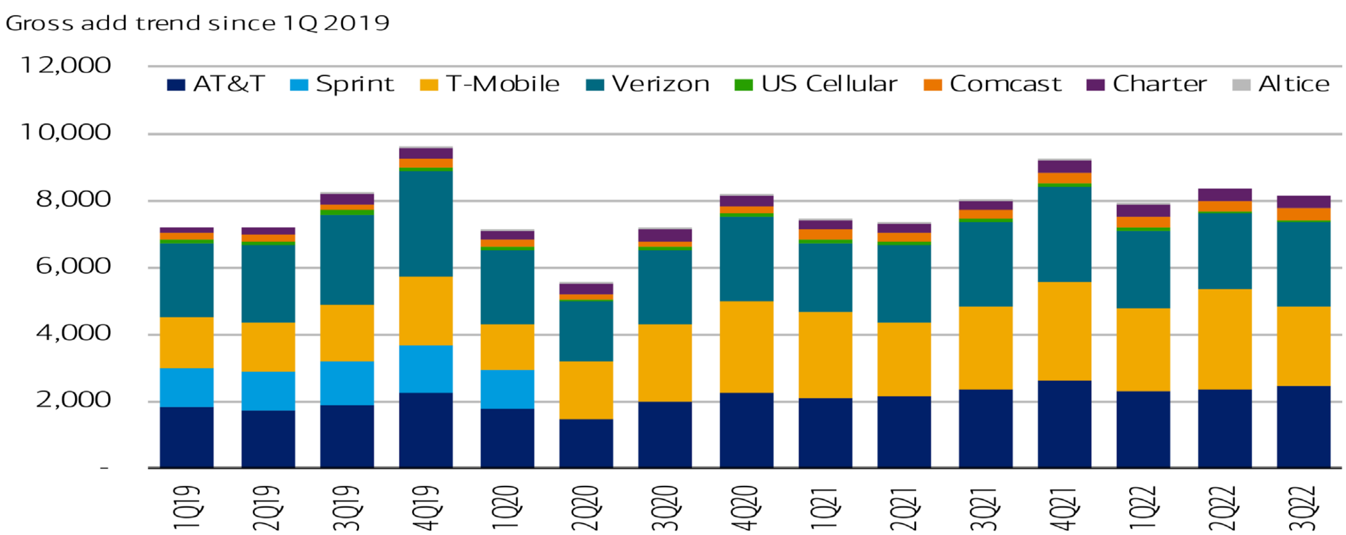
The global telecom services market size was valued at $1.65 trillion in 2020 and seen growing at a 5.4% CAGR through 2028. Rising spending on the deployment of 5G infrastructures due to the shift in customer inclination toward next-generation technologies and smartphone devices is one of the key factors driving this industry. An increasing number of mobile subscribers, soaring demand for high-speed data connectivity, and the growing demand for value-added managed services are the other potential factors fueling the market growth.

This industry is highly sensitive to the slightest change in regulatory, technological, and economic factors and has its own share of challenges largely stemming from these factors. Telcos are capital-intensive, but advances in technology have, aside from bringing new products and services to the fore, helped to improve network efficiency. Though equity funding is important, the industry relies heavily on debt issuances. Partnerships and vendor financing can help to temper this reliance.

The typical seasonal pattern for wireless postpaid phone gross additions is for relatively lower adds in 1Q and 2Q, giving way to progressively higher gross additions in Q3 with back to school and again in Q4 with holiday shopping.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA CAGR, EBITDA Margins, Debt/EBITDA, Dividend Yield, ROIC, Churn, Subscriber Adds



Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Telecom						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
TMUS	T-Mobile Us Inc	174.4B	8.97X	3.0973	34.4511	3.47%	104.93%	8.60%	-9.70%	-15.68%	-1.20%
VIV	Telefonica Brasil SA (ADR)		4.22X	1.6839	0.0147	5.41%	18.04%	16.09%	19.93%	-27.43%	4.02%
VZ	Verizon Communications Inc.	158.6B	6.38X	2.233	19.6504	1.40%	1.50%	24.08%	-21.21%	-5.14%	0.16%
T	AT&T Inc.	131.6B	6.58X	2.1528	20.7916	-4.49%	7.12%	19.45%	15.06%	-14.29%	-16.66%
AMX	America Movil SAB de CV (ADR)	57.2B	106.01X	40.8746		2.05%	6.75%	19.42%	11.70%	-1.52%	-14.90%
BCE	BCE Inc	40.5B	8.73X	3.7381	28.4267	2.55%	6.47%	22.53%	13.52%	1.64%	-0.59%
VOD	Vodafone Group Plc (ADR)	29.1B	6.04X	1.9718	27.4114	0.74%	-0.15%	14.68%	19.79%	10.00%	0.61%
TU	TELUS Corporation (USA)	28.6B	9.66X	3.5063	42.943	10.98%	17.69%	16.88%	-11.18%	0.81%	0.15%
ORAN	Orange SA (ADR)	26.2B	4.76X	1.4422	27.0535	0.54%	2.46%	5.93%	5.85%	0.00%	0.37%
RCI	Rogers Communications Inc (USA)	22.6B	10.28X	4.3098	42.2982	8.84%	23.39%	22.53%	9.00%	-8.33%	0.23%
TEF	Telefonica S.A. (ADR)	20.2B	6.11X	1.6696	21.3303	1.03%	4.06%	34.59%	10.40%	5.67%	7.30%
SKM	SK Telecom Co Ltd (ADR)	8.2B	5260.43X	1622.0553		2.71%	9.15%	8.28%	10.29%	-14.31%	-0.43%
DISH	DISH Network Corp	7.9B	9.57X	1.5974	-76.6797	-0.81%	-18.02%	17.91%	15.23%	-8.78%	-3.84%
KT	KT Corp (ADR)	7.3B	4631.04X	994.2403		3.31%	8.71%	6.71%	5.26%	10.68%	0.36%
PHI	PLDT Inc (ADR)	6.0B	5.51X	2.9318	-34.1338	5.00%	44.87%	22.63%	-6.21%	5.39%	-0.38%
USM	United States Cellular Corp	1.7B	4.79X	1.0929	-29.7954	0.06%	31.10%	4.63%	-29.69%	-68.11%	0.63%
TDS	Telephone & Data Systems, Inc.	1.2B	5.27X	1.1371	-17.0603	0.47%	1.11%	4.90%	-0.53%	-108.85%	0.93%
SHEN	Shenandoah Telecommunications Co	0.9B	11.83X	3.2365	-8.3557	6.54%	4066.00%	2.15%	-167.61%	-380.00%	5.29%
ASTS	AST SpaceMobile Inc	0.7B	-5.51X	47.5018		-81.59%	26.94%	-669.17%	-1087.36%	-16.39%	-10.80%
ATEX	Anterix Inc	0.6B	-12.58X	102.034	-6.6307	314.26%	-27.12%	-4423.43%	-876.20%	-15.37%	152.82%
CNSL	Consolidated Communications Holdings Inc	0.5B	6.05X	2.0801	-6.576	-4.08%	-638.60%	11.77%	-12.59%	-178.43%	-7.58%

Management Commentary

T-Mobile (TMUS) on differentiation and winning in markets…. "And for us, we have big, underpenetrated, logical, segment-driven growth strategies that are really differentiated versus our competitors, things like tackling smaller markets in rural areas where our market share is in the teens. Enterprises, where our market share is just breaking into the double digits. 90% of the customers are with AT&T and Verizon. Home Internet, huge tailwind for us, something that we're very excited about and continue to execute on very strongly. And Sprint churn. We've had great performance on churn. Now 2 quarters in a row, beating Verizon on churn, even with Sprint, Inc., and we've got some more room to run on our worst-to-first strategy that we've already proven we can do on the Magenta side. So that strategy sweeps across the top 100, while in smaller markets and rural areas, it's to go establish ourselves, and we're making incredible progress on that with share of switchers up several points from just a year ago."

Verizon (VZ) on ARPU growth…. "Yes. And this has been our strategy since the beginning. I mean clearly, to see that our customers are getting more value and they're stepping up the ARPU and the ARPU has been growing. And if you even look at the third quarter, our wireless service revenue was growing more than 3%, if you take away TracFone. With TracFone, it was more than 10%, but that was inorganic. So we continue to grow even though we have been slow on net adds on Consumer, not on business in the quarter. And that's really the focus we have. So right now, roughly 80% of our consumers on an unlimited plan and 42% of our consumers on Unlimited Premium. And we constantly have step-ups in between. We have the credit cards. We have the bundles with the Disney+, et cetera. So we have a lot of things that we're building on to bring it up. So still a lot to do here. I mean 42%, it means that it's quite -- 58% still to go there, and that's for us a goal to constantly move up our customers. And then, of course, we have still consumers on metered plan, roughly 20%, that we're moving up constantly as well. So there are a lot of that type of ARPU expansion that we can do. And over time, of course, we also see a step-up from the prepaid or the value segment to the premium segment. So I see several different ways on the consumer mobility where we can move our customers up. And of course, we need to take new customers as well. But there are many, many more absolute revenue dollars that can be accretive if you do the work all the way from the premium -- from the prepaid segment all the way up to the premium segment."

OptionsHawk Executive Summary & Focus Stocks

This group I prefer to keep very simple and stick with my view **T-Mobile (TMUS)** is far and away the best operator while T/VZ remain in trouble. **Rogers (RCI)** is a foreign telecom that screens very attractive on growth and margins.

Communications – Internet & Cable

Components: CHTR, LBRDA, LBRDK, LBTYA, LBTYK, IRDM, LUMN, FYBR, CABO, VSAT, CCOI, ATUS, GOGO, LILAK, SATS, PL, WOW

International & Private Peers

Intro

US cable stocks are trading at their lowest multiples in over a decade, hit by slowing growth and rising interest rates. In Cable, the advertising environment remains choppy amidst an uncertain economic environment. There is heightened competition and still slower than normal move activity creating a challenging broadband backdrop for cable operators. Cable companies are pushing ahead with network enhancements that create a path to eventual multi-gig symmetrical offerings. Comcast (CMCSA) and Charter both noted that the competitive environment for broadband has become more challenging and that move activity remains suppressed. The downside risk from here is that Comcast and Charter begin to see material broadband customer losses, as Altice USA has experienced. In addition, there is likely rising risk that the prospect of customer loss leads to discounting and an erosion of pricing power. The US broadband market is nearing 90% penetrated.

Early indications are that fixed wireless access (FWA) broadband customers report higher satisfaction with their broadband than both cable and FTTx. FWA customers skew younger and lower income than the broader US broadband population. Relative to existing market shares, more customers seem to be migrating from FTTx to FWA than from cable, although cable's ~2/3 market share still leaves it as the largest donor of customers to FWA.

Industry Backdrop & Investment Considerations

Companies in this group provide a variety of services such as high-speed data connects to the internet, video services, telephone, and business services. These providers, each to a varying degree, own and/or lease a network that allows them to deliver their services and distribute their signals to the homes and businesses of subscribers. In addition to building their own network backbone and/or leasing physical access to the network backbone, companies providing video services also purchase licenses to provide their subscribers with access to television channels owned by programmers and broadcasters via distribution over the network backbone. Companies providing video services also typically sell advertising on their video channels.

The global broadband services market was estimated at $355B in 2020 and seen growing at a 9.1% CAGR through 2028. Digital transformation of several industry verticals requires broadband services, thereby promoting market growth.

A few notable themes for cable/satellite include expanding EBITDA margins with stable to lower cable capital intensity due to a mix shift toward connectivity driving FCF growth, increased video competition from new DTC offerings, extension of cable's push into wireless, and increased 5G launches.

Edge computing services demand will significantly increase over the next several years, serving multiple verticals, including finance, healthcare, retail, manufacturing and other industries. As these use cases continue to emerge, secure network services will increase in importance as consumers require holistic solutions with the flexibility necessary to help accelerate the convergence of computing and communications capabilities with digital content.

Indicators, Metrics & Stock Selection Framework

EV/EBITDA, EBITDA CAGR, EBITDA Margins, Debt/EBITDA, Dividend Yield, ROIC, Churn, Subscriber Adds

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	EV/Sales	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Internet and Cable						#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
CHTR	Charter Communications Inc	48.8B	6.85X	2.75X	23.88X	2.10%	5.24%	21.00%	16.65%	3.62%	-0.18%
LBTYA	Liberty Global PLC	8.7B	7.16X	2.57X	15.61X	-2.68%	58.81%	12.80%	20.76%	-330.43%	-5.66%
LBRDA	Liberty Broadband Corp	10.8B	46.77X	15.07X	-273.72X	-13.65%	1247.11%	-9.92%	-13.26%	40.20%	-2.22%
IRDM	Iridium Communications Inc	6.3B	18.38X	10.94X	30.52X	6.87%	23.71%	7.54%	42.43%	-8.75%	7.80%
FYBR	Frontier Communications Parent Inc	5.9B	6.18X	2.16X	-11.92X	-1.02%	-2.52%	17.36%	-14.16%	32.04%	-0.34%
LUMN	Lumen Technologies Inc	5.6B	4.48X	1.75X	14.75X	-15.60%	-43.02%	21.77%	18.29%	-3.62%	2.17%
CABO	Cable One Inc	4.2B	8.53X	4.54X	25.30X	0.19%	5.57%	28.43%	19.45%	21.68%	-3.08%
CCOI	Cogent Communications Holdings Inc	2.7B	15.55X	6.06X	39.69X	5.17%	13.45%	20.22%	17.01%	-71.72%	-1.07%
VSAT	Viasat Inc	2.3B	7.64X	1.74X	-7.22X	14.62%	66.61%	0.30%	-17.39%	-700.00%	0.67%
GOGO	Gogo Inc	1.9B	14.76X	6.18X	46.28X	11.54%	-1.24%	35.93%	14.60%	-2.33%	4.26%
ATUS	Altice USA Inc	1.7B	7.16X	2.87X	33.96X	-3.35%	-5.98%	25.02%	16.08%	-28.90%	-1.95%
LILAK	Liberty Latin America Ltd	1.5B	5.60X	1.92X	12.75X	-2.49%	386.75%	1.69%	5.83%	-287.67%	-3.51%
PL	Planet Labs PBC	1.3B	-14.27X	4.67X		38.61%	-21.07%	-97.59%	-43.55%	-35.01%	43.23%
SATS	EchoStar Corp	1.3B	2.17X	0.69X	10.00X	-5.27%	-73.26%	10.93%	8.07%	12.05%	3.30%
WOW	WideOpenWest Inc	0.8B	5.33X	2.12X	-9.06X	-0.85%	45.31%	0.66%	-4.64%	-57.83%	-1.10%

Management Commentary

Charter (CHTR) on lack of moving, competitive environment and opportunity ahead…. "And the biggest change that's occurred in the last year or so has really been the activity of our customer base and our opportunity to sell to that customer base when they're in motion and moving and -- particularly moving. And our churn rates are still at absolute historic lows, our voluntary churn, meaning people choose to disconnect from us, nonpay. And our nonpay are still extremely low. Our voluntary is the lowest it's ever been. So it's been an unusual environment post this massive growth period associated with everybody staying in place. The competitive environment, in terms of growth of fiber competitors, hasn't really changed much. And yes, we've had the new entrant of fixed wireless. But on a relative scale, it's taken a pretty small base of our customer -- very small base relative to the change in the churn activity level and our ability to sell against that churn. But from a high-level point of view, I think that we still have tremendous growth opportunities for the company now and in the future. And our ability to provide really inexpensive products that are better than the current products, particularly mobile products, going forward are significant. And we -- if you noticed, our mobile growth has been accelerating, and it -- I expect it to continue to accelerate. And I think that acceleration, combined with the value proposition of having that connected to our broadband service and to actually make our advanced WiFi network work well with the mobile network so that it's actually superior to what an ordinary mobile network is, is our biggest opportunity to drive growth. And that growth will come in several ways. It'll come from -- there's an average of about $135 a month per household being spent on mobile services, 2.2 lines. And the average takeout of our average home for broadband is about $60 because there's promotional pricing in there and growth pricing that goes with the nominal price. And so there's a lot more money being spent on mobile than there is on broadband on a household basis. And we have the ability to reduce the cost of mobile significantly and still have a very good margin on the increment. And to combine that with our advanced WiFi in a way that, that mobile device works better than it ever would work otherwise, and I think that, that gives us the opportunity to grow our revenue on a per sub basis significantly. We have 32 million broadband customers and a little over 4 million mobile lines. So there's a lot of money by attaching those mobile devices to our existing base. That's probably the biggest single financial opportunity in raw dollars over the next 5 years. And then there's new construction. So we've been building about 1 million homes a year in new construction and connecting customers to that. But in addition to that, we now have rural development money. And so we're building 1.2 million customers that we've committed to now -- not customers -- excuse me, homes passed with RDOF funds and state funds. And there's another $42 billion coming next year to be distributed to bidders who can do that efficiently, which we are. And that -- as a result of that, we're going to have growth in the extension of the plant. We're going to have growth in our broadband customer base because it's a better value proposition and a better product. And we're going to have growth in our ARPU on our existing base because we're really underpenetrated."

Frontier (FYBR) on Fiber build-out…. "Well, first of all, I'd like everybody to put down on the record that our host said fiber is clearly the superior product. And it clearly is. Is it getting more competitive? No, I think fiber is very obviously the right technological answer for high-speed symmetrical connectivity to homes and businesses. The cable industry in the U.S. has done an amazing job over a very long period of time. But what we're now hitting is simply physics coupled with demand. Demand for data services is just growing logarithmically by month, by quarter, by year. And at some point, that intersects with the physical capability of underlying cable, which is just inferior to high-speed symmetrical fiber. Frontier network is already 10-gig capable end-to-end with almost no capital investment. Now will new fiber entrants mean more competition? I don't think so. Because as I said earlier, the U.S. has so much unbuilt white space. There are plenty of places for capital to go if it wants to build fiber, where the market structure can remain competitive yet supportive to good business cases. And certainly, that's what we are seeing. And we're adjusting our build plans, frankly. Where we do see people come in to the edges of our markets, we will go very hard in those markets and build them more rapidly than we've previously planned to. And we'll target those areas with marketing and go-to-market effort to make sure there's a super clear message is go build fiber, just not where we are."

OptionsHawk Executive Summary & Focus Stocks

This is a tricky group to assess and tends to not offer much growth outside of some of these specialty communication plays. **Charter (CHTR)** goes into the deep value buy group now trading < 7X EBITDA and seeing growth stabilize while being a top operator with plenty of potential to grow. **Iridium (IRDM)** makes the top small cap list once again offering rare growth and profitability in this group with satellite connectivity likely to be a growing theme in mobile. **Cogent (CCOI)** is the other small cap that screens attractive as growth should be set to accelerate.

Utilities

The best performing names were ones with high exposure to Alternative Energy which are seen to have a much stronger growth outlook and many traditional utilities are starting to expand alternative offerings.

The group is not very exciting with minimal growth and one we pay more attention to the balance sheet and regulatory changes for rates and often can just focus on a handful of quality operators. Location is also important due to the regulatory environment for allowing customer rates to be raised, notably Florida, Texas and California are utility-friendly states. Water is another small sub-segment that is likely to continue to outperform with the need for further infrastructure investments. Despite a surge in electricity usage residentially from work from home, the benefits were mostly offset by higher costs to supply electricity, and weather remains the most important driver in the short term.

Diversified Utilities

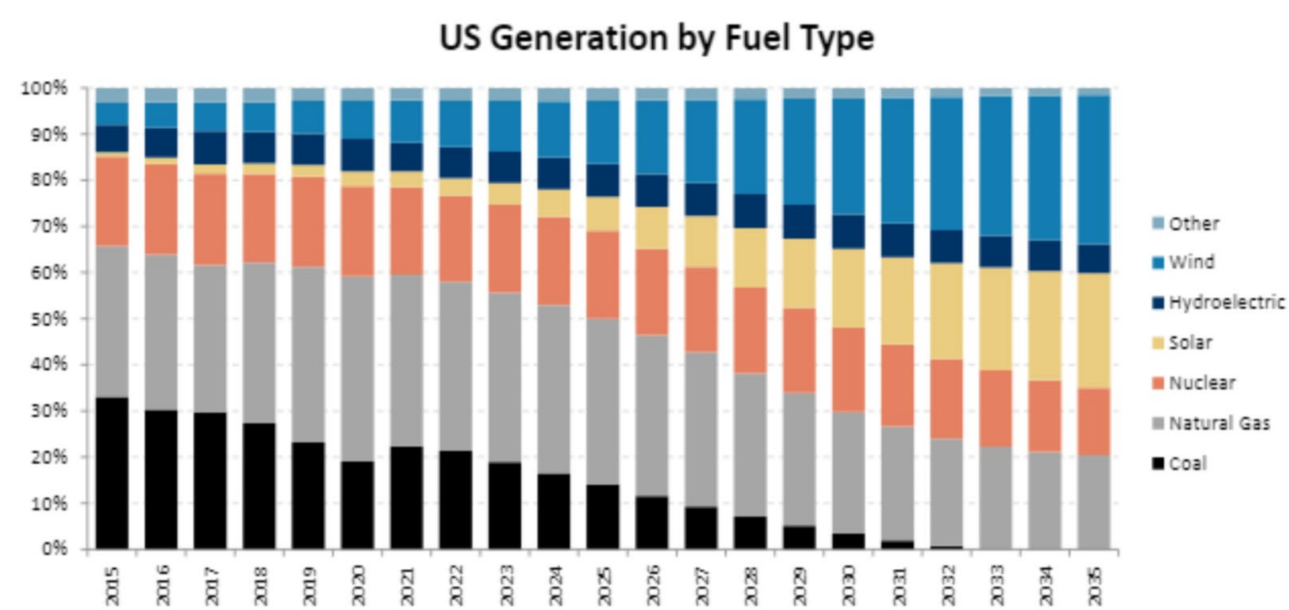
Components: NRG, ORA, CNP, D, NGG, EXC, SRE, PEG, ETR, BIP, FE, AES, BKH, NWE, ALE, AVA, MGEE, SJI, OTTR, UTL, SMR, AQN

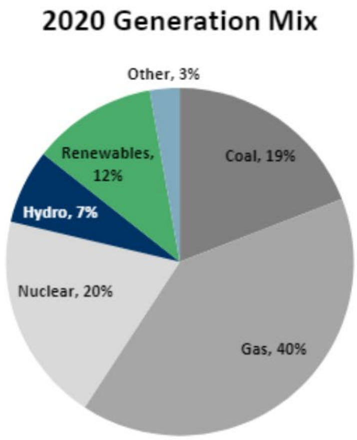
International & Private Peers

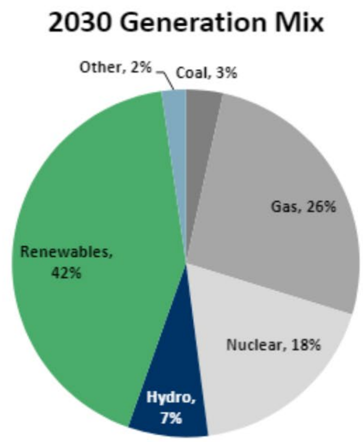
Intro

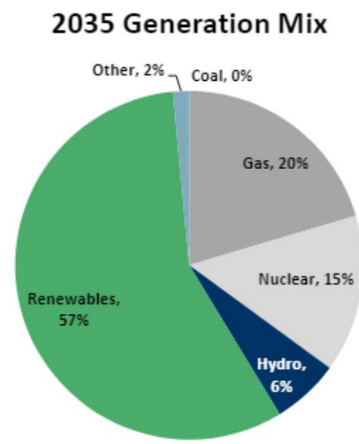
Utilities have outperformed the S&P by 20% this year and will continue to hold its value on a relative basis and potentially outperform slightly in the event of a weakening economic backdrop or full recession given the utilities group tends to outperform after earnings peak and after a recession begins.

IRA is a game changer for companies with renewables exposure extending tax credits for 10 years at attractive levels with phase-downs early next decade. Several utilities are poised to be significant beneficiaries lie AEP, AES and NEE while PEG/CEG are nuclear winners. Given the unprecedented policy support for renewables solidifying the economics and demand for solar, wind, and storage, along with the substantial growth in green hydrogen coming, utilities levered to renewables growth will experience earnings upside and multiple expansion.









The inflationary backdrop in commodity prices over the past year has led to steep increases in utility electric and gas bills. Energy burdens and utility affordability have increased in importance among many regulatory commissions as a result, especially as bad debt and delinquent payments have increased post-Covid. In states where the energy burden is above average and regulators are more highly focused on consumer affordability there will be increased pressure on utility growth aspirations. States most exposed to these challenges include California (EIX, PCG, SRE), Arizona (PNW), certain southeast states (particularly ETR), and northeast states (ED, ES, AGR).

Power prices and spark spreads have reached multiyear highs in key markets driven in large part by a steep climb in natural gas prices. As a result the outlook for 2024 EBITDA and cash flow has improved significantly for the IPPs. Power prices for calendar 2024 are up 50% YTD in PJM West and 70% in ERCOT, with spark spreads up 40% in PJM and 80% in ERCOT and dark spreads up 40% and 215%, respectively. A combination of factors has driven this spike: Henry Hub natural gas price is up 60% YTD, Appalachian coal prices have more than doubled in (and Illinois Basin prices up 4x), while PRB coal is relatively flat after a temporary spike in late 2021. Electricity demand has been strong with above-normal temperatures in much of the country this spring and summer, along with return-to-work trends leading to higher commercial and industrial power demand. Finally, coal supply has been constrained by issues ramping up mining activity to meet demand along with rail transportation bottlenecks, leading to gas plants dispatching and setting marginal prices more frequently than expected.

Industry Backdrop & Investment Considerations

Four key themes for the industry into 2023 include 1) Underappreciated renewables growth driving further upside for developers and utilities with ambitious decarbonization plans. 2) Climate risk as a persistent source of discounts for companies in challenging regions. 3) Attractive Independent Power Producer (IPP) cash flow is stronger and lower risk than appreciated, offering appealing investment cases and financial flexibility across the group. 4) Combination of bill affordability + regulatory backdrop will together be important factors influencing growth prospects.

Billion-dollar environmental disaster events are becoming more frequent, with ~6 occurring per year in the 2000s, 2x that level in the 2010s, and ~20 events per years in 2020-21. Utility stocks that face the highest physical risks from climate change include PCG, EIX, SRE, ETR, NEE, ED, ES, and AGR.

Indicators, Metrics & Stock Selection Framework

The Utility industry is one that we go back to an old-school analysis with valuation using EV/EBITDA, P/E, and P/Book while also looking at EPS growth and ROE as key metrics. There are also custom metrics like Non-Fuel

Operating & Maintenance (O&M) per MWh to measure operating efficiency. On a company-specific level investors may look at CAPEX plans and the rate outlook as well as customer and load growth trends. Dividend growth and FCF growth are also important indicators.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	ROCE	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Diversified Utilities				#VALUE!		#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SRE	Sempra Energy	50.9B	14.06X	3.04%	-64.29X	2.76%	8.65%	23.40%	-16.60%	4.24%	8.29%
D	Dominion Energy In	49.0B	12.96X	4.96%	-32.46X	4.95%	11.57%	21.62%	-13.77%	0.00%	0.24%
NGG	National Grid plc (AI	45.5B	11.41X	3.34%	-46.56X	5.83%	7.32%	20.88%	3.93%	11.18%	22.23%
EXC	Exelon Corp	42.1B	11.48X	4.21%	-65.69X	2.42%	8.09%	11.75%	-13.67%	0.44%	8.01%
PEG	Public Service Enter	30.1B	13.21X	11.46%	1426.84X	5.84%	10.60%	27.81%	-10.11%	-0.29%	-4.36%
FE	FirstEnergy Corp.	24.0B	11.81X	4.97%	-530.35X	2.80%	3.16%	20.67%	3.29%	1.24%	2.57%
ETR	Entergy Corp	23.8B	12.34X	17.81%	-176.66X	2.56%	11.04%	23.66%	-35.10%	1.03%	10.52%
CNP	CenterPoint Energy	19.3B	12.16X	5.18%	-18.34X	2.95%	13.29%	10.55%	-37.62%	0.73%	2.44%
AES	AES Corp	19.2B	11.78X	7.52%	47.61X	1.08%	16.73%	7.15%	-1.43%	2.30%	7.49%
BIP	Brookfield Infrastru	19.0B	20.08X	4.26%	79.17X	9.57%	9.69%	25.00%	6.11%	6.78%	41.90%
NRG	NRG Energy Inc	7.3B	7.61X	2.82%	13.64X	-3.58%	30.87%	12.38%	0.83%	30.36%	46.19%
AQN	Algonquin Power &	4.9B	10.75X	8.29%	34.17X	14.51%	53.19%	49.76%	-51.96%	-9.46%	-1.34%
ORA	Ormat Technologies	4.9B	15.41X	2.80%	-21.90X	18.64%	29.72%	25.54%	-24.20%	6.15%	-0.84%
BKH	Black Hills Corp	4.5B	12.71X	3.61%	150.58X	-0.48%	3.13%	21.00%	-38.07%	0.00%	14.21%
SJI	South Jersey Indust	4.4B	15.29X	1.04%	-26.30X	-4.89%	26.91%	17.20%	-13.00%	2.71%	25.94%
ALE	ALLETE Inc	3.7B	13.19X	2.97%		2.69%	4.79%	10.66%	-14.78%	0.40%	16.10%
NWE	NorthWestern Corp	3.3B	12.21X	2.99%		3.68%	13.09%	19.67%	-15.62%	-1.06%	7.32%
AVA	Avista Corp	3.1B	12.72X	1.25%		3.77%	26.06%	15.86%	-11.99%	-7.13%	3.44%
MGEE	MGE Energy Inc	2.6B	14.27X	6.01%		0.79%	13.95%	19.34%	-2.58%	5.49%	16.14%
OTTR	Otter Tail Corporati	2.4B	6.29X	13.98%		-14.26%	-36.43%	20.70%	4.96%	67.71%	29.58%

Management Commentary

Dominion (D) on geographic exposure…. “Our state-regulated utility model offers investors long-term earnings visibility and is enhanced by our concentration in these fast-growing constructive and business-friendly states. To state the obvious, we're monitoring what's going on in the broader economy. Like everyone, we're seeing inflation, supply chain limitations and higher fuel prices, all having an impact on customer rates and our balance sheet strength. We're keenly aware of the economic pressures that are affecting our customers and taking seriously our core mission to deliver reliable, affordable and clean energy to our customers, while creating value for our shareholders.”

AES (AES) on Renewables pipeline…. “As you can see on Slide 6, to address this expected growth in demand, we have been working hard to grow our pipeline of renewables and energy storage projects. Today, our pipeline stands at 64 gigawatts or more than twice the size of our entire current portfolio. The majority of our pipeline, 51 gigawatts is in the U.S. and much of it is in the most attractive markets for renewables such as California and PJM. Our pipeline consists of projects that have a combination of land, interconnection access or advanced permitting. Approximately 1/3 of our pipeline is in the energy communities that I previously described and are eligible for additional tax credits. We believe our pipeline will become increasingly valuable as sites for projects become scarcer. We also continue to make very good progress on our 2 very large green hydrogen projects in the U.S. and Chile, which include the integration of electrolyzers and renewables. Although we don't have any specific announcements to make today, we are confident that we will have more to share with you on this important initiative before the end of the year.”

OptionsHawk Executive Summary & Focus Stocks

This is a tough sector to just look at the metrics and come to a conclusion as it takes knowing each company well and its exposure to various segments and rate case situations. **AES Corp (AES)** is one I have studied and trades cheap while making a strong push into renewables and a leading ROE and EBIT growth. **Center Point (CNP)** is the other large cap that consistently screens strong to peers. **Ormat (ORA)** is a small cap favorite with its positioning in geothermal.

Electric Utilities

Components: NEE, BEP, VST, DUK, SO, AEP, XEL, ES, WEC, ED, DTE, PCG, EIX, PPL, AEE, FTS, CMS, AGR, LNT, KEP, EVRG, PNW, OGE, IDA, HE, PNM, POR, PAM, CEG

International & Private Peers

Intro

Moody's downgraded the credit outlook for the utilities sector to negative from stable November in , confirmation of the increasing risk profile and credit metric deterioration for many. Moody's believes that customer affordability challenges have increased uncertainty about how supportive regulators will be prospectively, including for purchased commodities, and higher operating & financing costs. Weak TTM credit metrics indicates less financial flexibility, potentially larger cash rate requests, and future equity needs. Recent regulatory outcomes in historically constructive Wisconsin and Michigan raise the risk profile of the entire utility sector.

Divots in earnings are re-appearing as the baseline employed for EPS growth is either delayed or otherwise caveated for those unable to linearly achieve EPS growth through the forthcoming twin O&M and interest headwinds to the industry. While elevated returns were tolerated historically we see emerging evidence that higher bills may put a squeeze to much for this. In particular watch restructured states where commodity procurement will prove an increasingly key subject. Provider of Last Resort (PLR) arrangements could come into greater focus as retailers are able to potentially undercut the PLR rates in a meaningful fashion to help customers 'save'. This could impact larger retailers.

While thus far our focus on interest rate exposure has been squarely around near-term headwinds, totality of 2023+ exposures with new issuances blending higher and refinancing activities now comes into focus. Inadequate capacity will prove the backdrop for regions as disparate as California (CAISO), Southwest (SPP), and Midwest (MISO). Acute shortages leading to changes in reserve margins, delayed retirement dates in the near-term, and shifting 'load contributions' (or ELCC) of solar could yet drive further additional procurement activity.

Industry Backdrop & Investment Considerations

Residential demand is about 35% to 40% of total U.S. electric consumption — it varies regionally, and among utility service territories and higher consumption is generally good for Utilities as residential has higher mark-ups.

For years utilities have generally prioritized financial earnings over cash flows, a tradeoff in an era of low interest rates and inflation.

Indicators, Metrics & Stock Selection Framework

The Utility industry is one that we go back to an old-school analysis with valuation using EV/EBITDA, P/E, and P/Book while also looking at EPS growth and ROE as key metrics. There are also custom metrics like Non-Fuel Operating & Maintenance (O&M) per MWh to measure operating efficiency. On a company-specific level investors may look at CAPEX plans and the rate outlook as well as customer and load growth trends. Dividend growth and FCF growth are also important indicators.

Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	ROE	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
SO	Southern Co	76.6B	13.97X	18.68%	-77.50X	-2.44%	8.46%	22.71%	-4.63%	1.13%	14.72%
AEP	American Electric Po	49.1B	12.48X	13.72%	-37.11X	-0.13%	8.94%	19.80%	-11.46%	0.58%	5.02%
PCG	PG&E Corporation	39.6B	11.97X	11.05%	-31.55X	5.37%	21.46%	19.53%	-26.29%	0.46%	2.17%
XEL	Xcel Energy Inc	38.6B	13.02X	16.05%	-76.95X	0.74%	12.95%	16.40%	-15.30%	-0.16%	6.95%
ED	Consolidated Edisor	34.4B	12.01X	11.26%	-8412.76X	0.13%	8.17%	46.39%	-9.14%	0.22%	2.27%
WEC	WEC Energy Group I	30.5B	15.12X	10.64%	-45.29X	3.83%	6.05%	20.62%	-2.65%	2.09%	8.21%
CEG	Constellation Energy	29.3B	12.91X	-6.90%	29.42X	-12.75%	49.23%	-1.76%	-13.57%	-4.54%	3.99%
ES	Eversource Energy	29.3B	14.24X	9.18%	-19.03X	1.38%	9.27%	20.84%	-12.20%	0.00%	10.18%
EIX	Edison Internationa	25.5B	10.55X	14.48%	-18.38X	3.76%	17.76%	19.93%	-36.86%	0.88%	1.71%
DTE	DTE Energy Co	23.1B	13.12X	14.17%	-39.77X	-5.19%	12.22%	11.26%	-4.71%	1.66%	12.02%
AEE	Ameren Corp	22.8B	13.36X	18.01%	-50.35X	3.05%	10.81%	20.85%	-29.12%	0.49%	4.88%
PPL	PPL Corp	21.6B	11.40X	8.79%		5.92%	8.57%	26.18%	10.05%	-6.67%	-0.29%
FTS	Fortis Inc	19.6B	13.10X	6.61%	41.17X	3.21%	2.36%	26.13%	-5.07%	-1.60%	5.61%
CMS	CMS Energy Corpor:	18.3B	13.20X	9.46%	-34.59X	3.05%	10.97%	16.03%	-3.51%	0.45%	2.18%
AGR	Avangrid Inc	16.5B	13.81X	2.52%	-22.46X	4.65%	15.68%	12.68%	-20.29%	13.17%	6.02%
EVRG	Evergy Inc	14.4B	11.32X	19.55%	109.17X	1.43%	2.88%	23.17%	-11.11%	0.85%	3.48%
LNT	Alliant Energy Corpc	13.9B	13.34X	15.16%	-232.43X	1.30%	3.89%	21.67%	-13.30%	2.00%	-0.04%
BEP	Brookfield Renewab	11.0B	26.28X	-5.95%	155.77X	2.06%	22.08%	23.07%	-30.41%	-455.56%	12.12%
KEP	Korea Electric Powe	10.2B	8.33X	-46.11%		17.26%	-52.44%	-9.67%	-13.63%	171.35%	8.02%
VST	Vistra Corp	9.7B	7.77X	48.70%	11.89X	5.22%	30.82%	12.54%	-15.27%	9.54%	5.54%
PNW	Pinnacle West Capit	8.9B	11.37X	21.48%	-90.28X	3.59%	2.76%	21.17%	-16.13%	6.90%	4.28%
OGE	OGE Energy Corp.	8.0B	11.25X	24.17%		0.40%	-0.99%	2.23%	-29.88%	3.50%	41.61%
IDA	IDACORP Inc	5.4B	14.34X	15.52%		-0.82%	0.85%	21.52%	4.34%	2.40%	5.02%
HE	Hawaiian Electric In	4.4B	12.07X	11.12%	-163.69X	7.26%	8.38%	13.54%	2.15%	1.42%	17.95%
POR	Portland General Ele	4.4B	9.31X	8.44%		0.01%	4.25%	15.78%	-4.34%	0.11%	3.08%
PNM	PNM Resources Inc	4.2B	11.58X	23.16%		5.61%	11.46%	18.32%	-21.75%	3.92%	10.67%
PAM	Pampa Energia S.A.	2.7B	772.60X	33.55%		77.94%	61.03%	39.01%	39.08%	1.67%	74.90%

Management Commentary

NextEra (NEE) discussing the IRA…. "But one of the things that I want to make sure investors understand is the way that the Inflation Reduction Act was drafted, remember that the production tax credits at 100% for wind, 100% for solar and the 30% investment tax credit for storage, those apply until the country is able to reduce its GHG emissions by 75%. We don't expect that to occur until sometime in the mid-2040. So we internally view this as an expectation that we could have 100% PTC in those 3 areas for more than the next 2 decades. And then obviously, those would roll off as you get in the latter part of the 2040. So that certainly gives us a very strong balance in terms of the growth possibilities for the company long term. But here are some of the things that you should take away from what [IRA] means for the business. Again, the bottom line is that over 2 decades of incentives and growth visibility but -- and obviously, what that means for wind and solar growth. But some -- the two things that aren't talked about a lot, and I've got a couple of slides here on, one is repowers. We have an enormous operating portfolio today and a significant backlog. And so I take the simple example, if I put a wind project into serves in 2022, I should be able to repower it the first time in 2032 and then the second time in 2042. And that creates an enormous competitive advantage for a company like NextEra because given the supply chain relationships that we've already had for the last couple of decades and given the scale at which we're making purchase decisions, we can do things that are a lot different than the smaller developers that we compete with in wind and solar and battery storage."

American Electric (AEP) on its growth outlook…. "AEP's territory is centered on growth. We continue to see growth. You're going to see a forecast for load that are higher than what we've typically had going into our yearly forecast. And those are really driven by a couple of things, from my opinion, and that is really centered on onshoring -- certainly manufacturing, onshoring and those kinds of activities being brought back to the U.S. are typically coming to our service territory, which accommodates manufacturing very well. And certainly, when you think about some of the other areas of growth, whenever you have fuel-related issues, energy-related issues, that bodes well in terms of pipeline growth, in terms of whether it's chemicals and other manufacturing and of course, now chip manufacturing in our territory as well."

OptionsHawk Executive Summary & Focus Stocks

Once again there are a ton of names in this group and the sector tends to be highly correlated so you really only need one or two names. **Constellation (CEG)** is a name I profiled in 2022 as a key play in Nuclear and even with shares up 110% in 2022 I still like it for scarcity of nuclear plays. **Xcel (XEL)** screens annually as a top play in the group and continues to look solid across key metrics while **Edison (EIX)** would be the value buy of the group along with **Vistra (VST). PNM Resources (PNM)** screens real attractive among US small cap utilities as a top name while **Pampa (PAM)** in Argentina has amazing metrics.

Gas Utilities

Components: ATO, NI, UGI, NFE, OGS, SWX, NJR, SR, BIPC, CPK, NWN, SPH

International & Private Peers

Intro

The same themes discussed in the prior Utility groups carry through to this one such as customer bill pressures, floating rate debt and pension risk and the IRA impact. Gas costs remain elevated and will put pressure on winter heating bills.

The backdrop for gas utilities relative to electrics has deteriorated following the passage of the Inflation Reduction Act and as gas prices move to new highs as LDCs look to lockup pricing for the winter heating season. The main consideration is around utilities' ability to flow through productive capital to customers on top of increased fuel costs.

Much of the conversation in utilities has revolved around the renewables opportunity created by adjusted and extended tax credits and the impact of AMT (ATO being the only gas utility likely to be exposed to AMT in the coming years). Additionally, gas utilities must contend with the methane fee that will raise distribution customer bills by about 1-3%. There will likely be some impact on gas utilities' intrastate pipeline and storage assets depending on emissions profile.

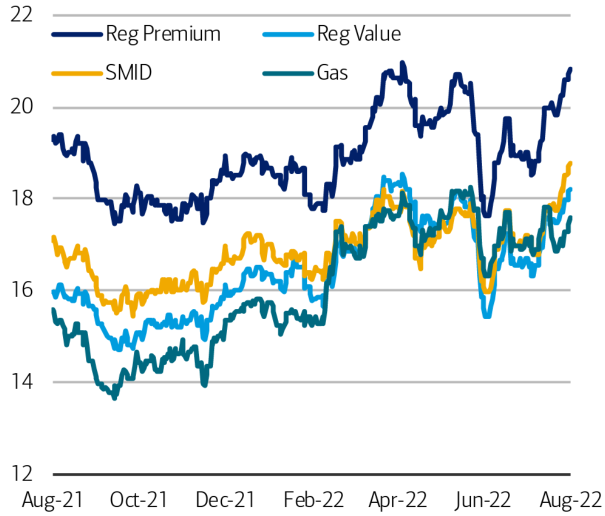
The biofuel credit is a positive for those investing in renewable natural gas and the hydrogen credit could create an opportunity for some, but likely longer-term.

Indicators, Metrics & Stock Selection Framework

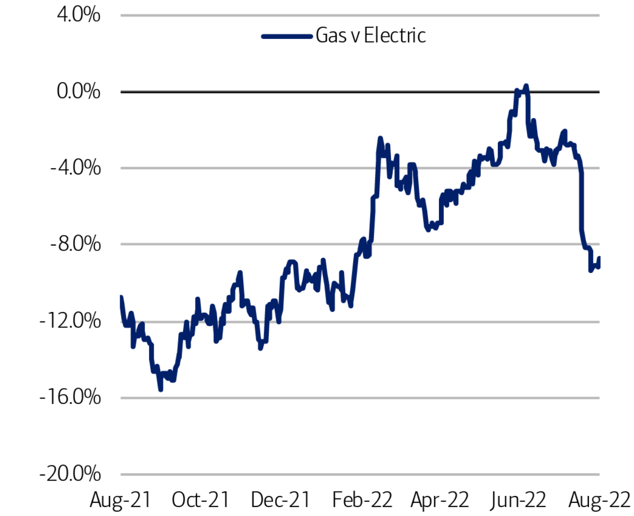
The Utility industry is one that we go back to an old-school analysis with valuation using EV/EBITDA, P/E, and P/Book while also looking at EPS growth and ROE as key metrics. There are also custom metrics like Non-Fuel Operating & Maintenance (O&M) per MWh to measure operating efficiency. On a company-specific level investors may look at CAPEX plans and the rate outlook as well as customer and load growth trends. Dividend growth and FCF growth are also important indicators.

Valuation & Comps

Gas utilities have trailed electric peers since the June/July timeframe



Gas utilities trade at a 8%+ discount to electric peers



Ticker	Company	Mkt Cap	EV/EBITDA	ROE	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Gas Utilities				#VALUE!		#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
ATO	Atmos Energy Corpc	16.2B	13.64X	3.07%	-19.16X	5.42%	13.29%	21.92%	-34.91%	8.60%	22.99%
NI	NiSource Inc.	11.1B	11.38X	3.06%		4.12%	13.10%	21.69%	-15.13%	0.00%	3.17%
NFE	New Fortress Energy	9.4B	12.47X	18.35%	-17.24X	51.68%	88.38%	18.06%	-44.19%	-6.75%	24.68%
UGI	UGI Corp	8.0B	8.73X	12.13%		-11.92%	6.47%	16.13%	-0.87%	8.70%	8.48%
NJR	New Jersey Resourc	4.7B	14.70X	10.69%	-190.89X	5.45%	10.93%	13.30%	-8.11%	8.85%	1.95%
BIPC	Brookfield Infrastru	4.6B		-69.31%		#VALUE!	#VALUE!	71.58%	25.68%	#VALUE!	#VALUE!
SWX	Southwest Gas Hold	4.4B	11.07X	-0.38%	-39.17X	4.35%	29.49%	43.75%	-16.42%	-24.84%	4.89%
OGS	ONE Gas Inc	4.1B	12.92X	3.87%		3.74%	6.14%	17.15%	-112.29%	-0.24%	14.64%
SR	Spire Inc	3.5B	11.69X	-4.43%		4.53%	8.15%	18.57%	-22.62%	7.79%	6.23%
CPK	Chesapeake Utilities	2.1B	13.56X	4.74%	-82.76X	11.29%	10.45%	23.00%	-6.39%	-1.86%	6.56%
NWN	Northwest Natural H	1.6B	10.53X	-6.93%	-32.93X	7.55%	15.27%	18.96%	-15.52%	-0.58%	10.75%
SPH	Suburban Propane F	1.0B	7.23X	-40.74%	11.81X	6.83%	-23.18%	11.94%	11.73%	20.73%	0.00%

Management Commentary

Atmos (ATO) on steady growth and capex…. "The foundation has been set with a proven safety-driven accompanied with organic growth that yield 6% to 8% fully regulated earnings per share, commensurate dividend per share growth supported by a strong financial profile. Additionally we operate in a diversified and growing jurisdictional footprint that is supportive of our natural gas investment and natural gas infrastructure. 98% of our rate base is situated in 6 or 8 states that have passed legislation in support of energy choice. We have constructive regulatory mechanisms that support the necessary capital investments to modernize our natural gas distribution, transmission and storage systems. We have a long runway of work to support the planned $15 billion in capital spending over the next 5 years."

NiSource (NI) on premium utility status…. "We're driving to become a premium utility. But what exactly does that mean? A premium utility provides safety above all else, as we do. In NiSource, our team's focus on the safe and reliable service to our customers, employees and communities is second to none, and the resilience and reliability of our systems has never been more important than they are today. Premium utilities are also long-term infrastructure investors. Every day, they make investment decisions on assets planned to deliver value to stakeholders for up to 40 years into the future. To successfully execute on these investments requires premium utilities to have constructive regulatory backdrops. This underpins their ability to make those investment decisions that benefit their customers and provide a return to their investors. We offer a very attractive total shareholder return proposition of 9% to 11%, more derisked customer rate sensitive, 6% to 8% annual growth in net operating earnings per diluted share, our 8% to 10% growth in rate base and our targeted 60% to 70% dividend payout ratio. Add to that, more than $30 billion of investment opportunities and a strengthened balance sheet. This is what we believe a premium utility looks like."

OptionsHawk Executive Summary & Focus Stocks

New Fortress (NFE) was a top pick that soared 80% in 2022 and continues to screen extremely strong to peers despite valuation relatively in-line. NFE is an integrated energy platform targeting the delivery of cost-efficient low carbon energy and power solutions to its customers through switching from higher emissions fuels (oil, coal) to cleaner alternatives (natural gas, hydrogen). NFE's primary business involves sourcing liquefied natural gas (LNG) and delivering it to its downstream terminals, power plants and industrial customers, largely located in the Caribbean and Central/South America. The other stocks in this group screen weak compared to Utility peers.

Water Utilities

Components: AWK, WTRG, AWR, CWT, SJW, MSEX, YORW, SBS

International & Private Peers

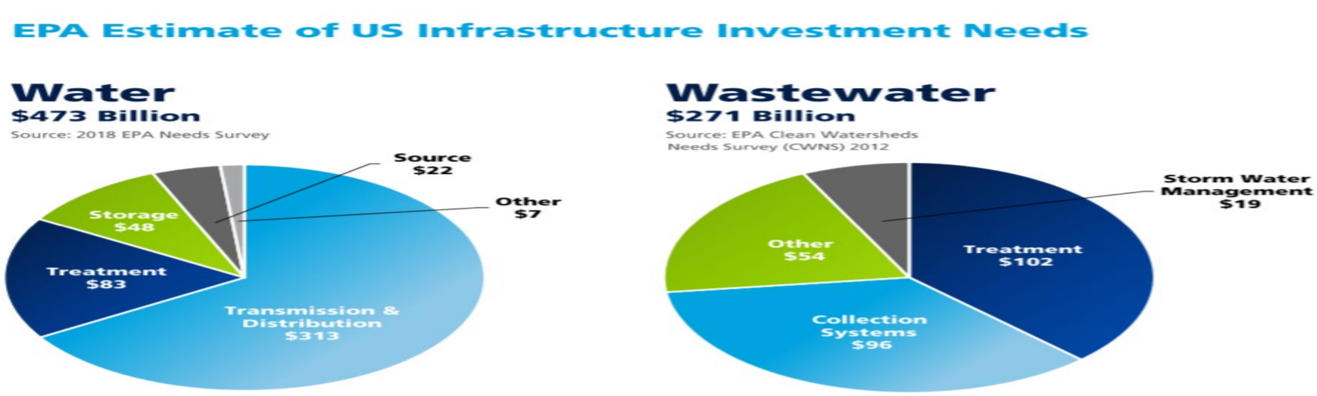
Intro

Secular tailwinds remain in play to drive industry consolidation with the upcoming proposal from the Environmental Protection Agency (EPA) around an enforceable (& much more stringent) PFAs likely the a lever to enable. Although industry consolidation tailwinds and growing visibility to more military opportunities (with 70 additional installation opportunities) to supplement core regulated growth is evident, navigating macro headwinds from inflation and rising rates will be critical.

Industry Backdrop & Investment Considerations

The basic driver behind likely future growth (and profitability) of these water utilities is clear. Demand for clean water will continue to rise with growing population and economic activity, but supply is basically fixed.

The ability to meet the existing and future water demands of customers depends on an adequate water supply. Drought, governmental restrictions, overuse of sources of water, the protection of threatened species or habitats, contamination or other factors may limit the availability of ground and surface water. Water supply is seasonal in nature and weather conditions can have a pronounced effect on supply. Customer demand is generally greater during the warmer months, primarily due to increased water usage for irrigation systems and other outdoor water use. Weather that is hotter and/or drier than average generally increases operating revenues, whereas, weather that is cooler and/or wetter than average generally serves to suppress customer water demand and can reduce water operating revenues.



Indicators, Metrics & Stock Selection Framework

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Valuation & Comps

Ticker	Company	Mkt Cap	EV/EBITDA	ROE	EV/FCF	Revenue CAGR (FY1-2)	EBIT CAGR (FY23 to FY24)	EBIT Margin	FCF Margin	EPS Est. Change	Revenue Est. Change
Water Utilities				#VALUE!		#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
AWK	American Water Works Company Inc	27.7B	19.58X	15.50%		7.81%	9.88%	30.43%	-8.22%	0.23%	-0.75%
WTRG	Essential Utilities Inc	12.5B	18.83X	5.14%		3.36%	13.96%	32.09%	-20.01%	0.00%	4.01%
SBS	Companhia de Saneamento Bsc DEDSP (ADR)	7.1B	7.70X	16.13%	17.72X	8.20%	30.57%	20.91%	0.86%	-9.90%	21.19%
AWR	American States Water Co	3.5B	22.24X	14.66%		3.08%	8.94%	28.26%	-5.80%	-6.38%	-0.68%
CWT	California Water Service Group	3.3B	16.73X	18.05%		4.96%	18.51%	16.03%	-7.77%	-13.91%	-0.96%
SJW	SJW Group	2.3B	16.92X	9.63%		4.03%	9.49%	19.38%	-21.09%	-2.88%	-1.55%
MSEX	Middlesex Water Co	1.6B		29.88%		10.17%	#VALUE!	75.60%	-32.38%	-4.81%	-1.49%
YORW	York Water Co	0.6B		13.04%		3.39%	#VALUE!	42.83%	-20.77%	7.81%	7.27%

Management Commentary

American Water (AWK) on differences to other utilities…. "However, the water industry and American Water also have some important differences from other utilities. Our capital projects, for example, are much smaller on average than those in the electric and natural gas industries. Even though they add up to a similar and very significant investment need. Another difference is our greenhouse gas emissions footprint, which is very small compared to most other publicly traded electric and gas utilities. That said, we are seeing the impacts that climate variability can have through more extreme droughts or more severe floods. We strongly believe we must do our part to reduce overall greenhouse gas emissions. We have now set ambitious greenhouse gas reduction goals, including achieving net zero by 2050. Along with our goals for system resiliency, and water use and efficiency, we see our greenhouse gas reduction goals as part of our commitment to provide superior and affordable service to our customers. We believe American Water is the leader in a clean water and wastewater transition in the United States. In summary, we believe the combination of our EPS and dividend growth supported by significant and yet low-risk capital investment plan as well as our ESG leadership premium and constructive position on affordability will continue to be rewarded by investors. Based on the long-term plan and our history of executing on our strategies, we expect to continue to deliver a very competitive, sustainable shareholder return for many years to come."

OptionsHawk Executive Summary & Focus Stocks

The water utilities are always the preferred group given much stronger growth and higher ROE. **Sanemento Basico (SBS)** out of Brazil actually screens by far the best value for growth name. **California Water (CWT)** a small cap that screens attractive to peers on valuation and the strongest forward profit growth forecast. **American Water (AWK)** remains the best-in-class compounder but does carry a premium multiple.

Conclusion

I have now covered each of 179 sub-industries that I broke the market down into for easier and more efficient analysis. I covered some more extensively than others and this is an ongoing process, much like investing, continuously learning about companies and their industries. My plan for 2023 is to create a web-based platform for each of these groups and can contribute more insights and information throughout the year as I read a lot of research, follow management calls and pay attention to thematic growth trends. I am currently designing the template for this project. This project will include the static data such as industry backgrounds and well as integrate automated updates of news, valuation metrics, relative performance charting and much more.

Through this report I also kept track of the quality names highlighted to put them all in one place for readers, helpful for watchlists, and broke them into unique categories that I will put below. Some may say there are too many names but if you look at performance numbers there are also a lot of strong performers in the market each year, so this process is more about creating an investable basket. While the portfolio top picks section is tailored to longer term investors, this basket of names is for active traders to quickly access the best names to be trading when the market conditions call for it, for me, typically a combination of notable options flow and technical set-up. I certainly do not expect one to read this report in one day, that would be deserving of a medal, but it is created annually more-so as a reference to encourage expanding your horizons and looking across multiple industries to capitalize on ever-changing market trends/flows. I have found no better way to find great stocks than by breaking down industries into these custom groups and screening across key metrics and then you can dig deeper into the individual companies.

Thanks for Reading!

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