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TRIVARIATE RESEARCH

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PURPOSE

This document is meant for those who want to sit down for 60-90 minutes, once a month, and take full stock of major issues impacting US equities. It includes:

- Four Charts You Can't Miss
- An Overview of US Equities, Today's Macro Regime, Earnings and Multiples
- 100 Year of Context on This Year's Sell-off, Impact of S&P Index Changes on Earnings / Multiples
- Growth Stocks – A 20-Year Historical Perspective, Compounders, and Double Whammies
- Notes on Melting Ice Cubes, and Performance after CEO Changes
- Capital Use and Its Consequences – Buybacks, Dividends, Buybacks, Capx / R&D
- Interest Rate Perceptions
- Sizing and Risk Management
- Sector Bets

Please contact us or log into our website www.trivariateresearch.com for access. To trade our baskets – like long compounders and short melting ice cubes, or long SP additions and short potential deletions, please contact us.

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For further information on our Quantitative Frameworks or to view our full collection of research, data, bespoke services, visit our website www.trivariateresearch.com for access or contact our Head or Sales, Colin Cooney at colin@trivariateresearch.com

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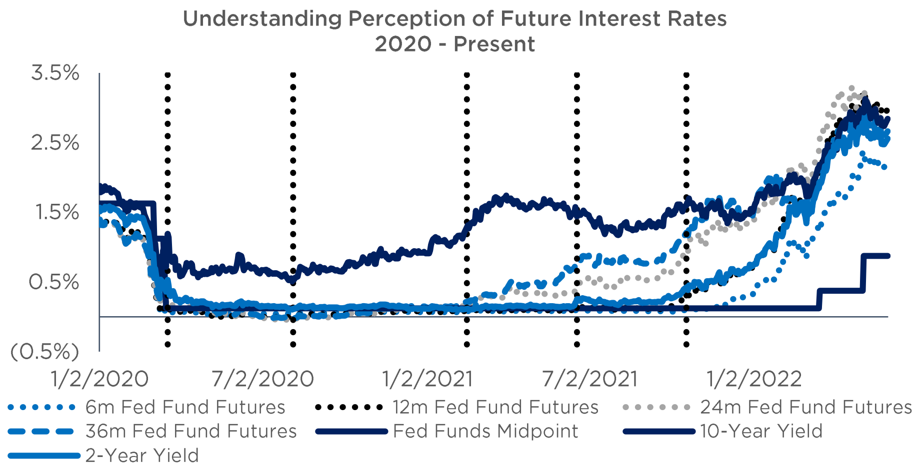
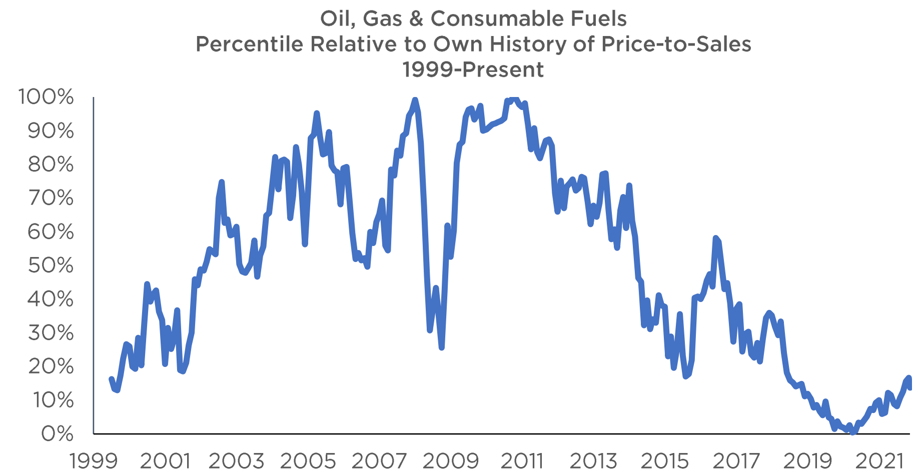
FOUR CHARTS YOU SHOULD NOT MISS

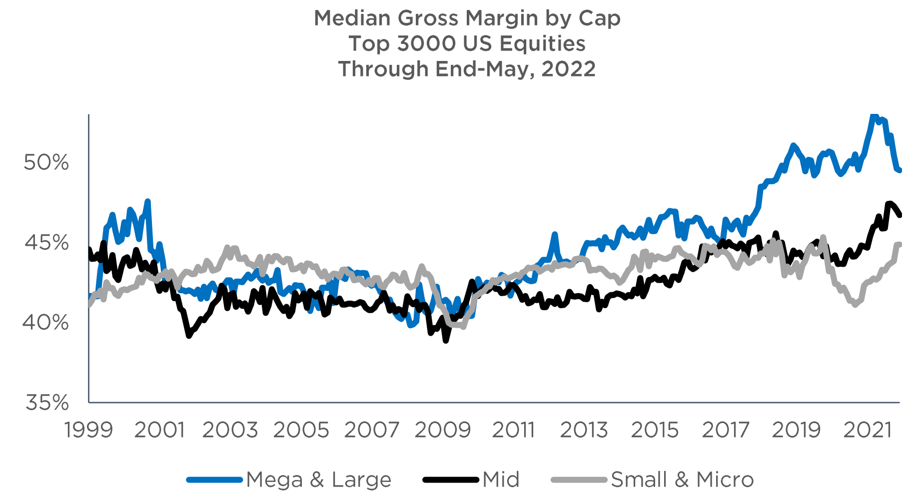
Changes to perceptions about interest rates will be crucial for short-term market multiples (upper left). Despite the rally, energy is still cheap (upper right). We like materials, energy, and healthcare, and are cautious industrials staples (bottom left). Gross margins will likely trough above prior peaks (bottom right) and are key for stock selection.





Trivariate Sector Recommendations

Sector	Recommendation	Comments
Materials	Overweight	Buy the cheap stocks with upward revisions
Health Care	Overweight	Healthcare services have cheap growth, and the biotechnology sell-off appears over-done
Energy	Overweight	Supply won't catch up for awhile and we do not see demand destruction yet
Information Technology	Equal-Weight	Focus on positive FCF, pricing power – avoid profitless software
Utilities	Equal-Weight	Some idiosyncratic investments are sensible
Real Estate	Equal-Weight	Metrics for stock selection are becoming more effective, commercial remains challenged
Consumer Discretionary	Equal-Weight	Margins are at risk with rising input costs
Financials	Equal-Weight	Prefer large cap banks to small
Communication Services	Equal-Weight	Makes sense to keep market-weight FAANGM
Industrials	Underweight	Industrial activity is rolling over, but earnings expectation are very high
Consumer Staples	Underweight	Plenty of short ideas in idiosyncratic staples, and valuation of large-caps is stretched



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INVESTMENT CONCLUSIONS

Long-term outlook: Our long-term outlook for US equities generally assumes mid-single digit forward 12-month returns, and that is still our base case for the next twelve months. While the massive change to the perception of interest rates morphed into a full-on growth scare in Q1, we still see earnings growth for 2022 over 2021 as likely. Macro conditions have obviously peaked and softened, and a stronger dollar and rising commodities are not great for SP500 earnings. Hence, the expectations for 9.9% 2022 YoY earnings growth are likely too high. The consensus has clearly shifted toward a high probability of a slowdown, and few now believe the bull case is likely, Our longer-term algorithm for US equities is that we expect a 2% total yield (net buyback plus dividend), nearly a 2% mix shift from new companies added to the SP500, and 3-5% "organic" EPS growth, totaling to a 7-9% total return, which is attractive vs. all other major asset classes in our judgment.

Margins and Multiples: Pushback from investors is usually around high margins or the elevated market multiple. While the market is slightly expensive relative to its own history on forward earnings, the constitution of the market has changed with FAANGM and biotech/software. The key is whether wage/commodity inflation and supply chain disruption will cause broad based margin contraction, and the recent Russian / Ukraine war certainly exacerbates the energy-related challenges. At present, the market trades around 18x the consensus 2023 earnings, which we think is reasonable, only a small premium to the long-term average of 17x forward earnings which seems merited given the constitution of companies, their margins, the bank balance sheets, etc. Calling the market multiple is challenging, as the shift from QE to QT makes some think multiples will go way below long-term averages.

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BUY IDEAS

1) **Buy oil-sensitive energy stocks:** The risk-reward skewed to the upside for oil. We have been pushing this for over one year, but our main thesis of upward revisions, cheap valuation, positive price momentum, and negative aggregate positioning all exist.
2) **Buy metals:** We continue to like aluminum and copper and think these stocks are discounting massive negative earnings declines in 2023 and beyond. On the contrary, we think long-term demand growth will exceed GDP, and is likely to exceed supply growth for sustained periods
3) **Buy mid-cap biotechnology:** Innovation has been overly discounted with all-time lows on price-to-sales now achieved. Over 85% of biotechnology companies never generate positive cumulative free cash flow so rising does not crush the long-term value for most.
4) **Buy healthcare services:** They have above average revenue growth, lower volatility of growth, yet lower valuation. We like UNH – pricing power, inflation beneficiary, value, and growth.
5) **Buy value consumer discretionary and short expensive consumer staples:** Investors are paying too much for growth staples, and value discretionary have never been cheaper on price-to-forward earnings. Consumer spending will slow, but high vs. low end bifurcation exists.
6) **Buy US semiconductors:** The prices have started to discount a recession, with the group down 25% YTD. There are so many secular winners, that while most likely have excess in their backlogs, a recession in their earnings is at least partially discounted.

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STOCKS TO SELL

1) **Short low-quality work-from-home and reopening stocks:** High quality reopening has lagged low quality work-from-home since the beginning of COVID. While this has sharply corrected in the last few months, we think this trend will continue. NFLX is a good example. We can provide a list of junk stocks with high correlation to our work-from-home basket or our reopening basket upon request.
2) **Short profitless software:** Following growth stock sell-offs, outperformers have positive free cash flow and gross margin expansion. We recommend investors short those with contracting or stagnating margins and negative free cash flow. BILL is one we highlighted as negative FCF, decelerating forecasted revenue growth, and high valuation.
3) **Short select industrials:** Industrials with high incremental gross margin expectations will continue to underperform because industrial economic activity has moderated. We would avoid capital goods / machinery stocks with incremental gross margin expectations. The sector has had the most negative earnings revisions of any sector YTD, but estimates remain too high in our judgment.
4) **Short expensive staples:** Some staples are over-earning due to COVID behavioral shifts, and now embed continued high growth and elevated valuation, creating potential downside as growth eventually disappoints. CLX, SMPL, BGS are examples of expensive staples.
5) **Short regional banks:** Some rate-sensitive banks have seen strong price-to-tangible book expansion on a changed perception of rates that may ultimately prove to be overly optimistic. We recommended short SBNY because it is loved (16 buys, 0 holds, 0 sells). For other bank short ideas, please contact us.

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SUMMARY OF KEY RESEARCH

Assessing macro conditions: Few if any areas of the economy are both increasing and accelerating. We analyzed over 150 macro variables, and have largely concluded that economic activity has peaked, but remains robust in absolute terms. The consumer (wages, jobs) data look stronger than housing and industrial activity (where transportation prices have declined). However, the consumer have plateaued, ending a run of 14 consecutive months of increasing consumer strength. A strong dollar, and higher oil and commodities are accompanied by tighter financial conditions. Perceptions about interest rates are what matter now, with any incrementally dovish commentary likely bullish for equities.

If risks did not change, anyone could do risk management. The importance of measuring "work from home" vs. "reopening" exposure crossed with quality and junk, inflation exposure, and the unprecedented correlation of signals in certain segments like industrials are all huge risks that grew after COVID-19 roiled markets in Q1 2020. When considering risk, investors should consider signal correlation, correlation convexity and negative asymmetric beta.

Growth managers should avoid expensive stocks with new CEOs, as 65% of these stocks underperform over the next 4 to 8 months. They also should question whether buybacks are prudent, as in aggregate this has destroyed value since the financial crisis. The initial reaction to deals is prescient, as acquirers buying more than 20% of their market capitalization that lag the market for the first week of trading post the announcement tend to lag for nearly two years. Buybacks have recently failed, where as dividend growth is a sustainably good strategy as interest rates rise. Avoiding rising capital and R&D intensity in growth stocks is typically sensible.

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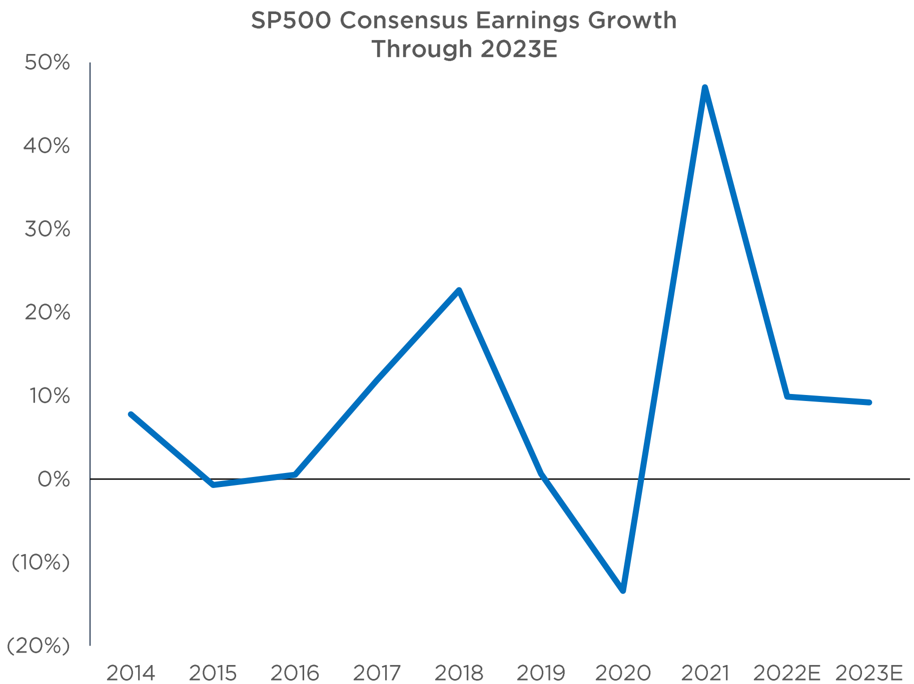
WE REMAIN CONFIDENT 2022 EARNINGS WILL GROW VS. 2021

Our base case is still that 2022 earnings are above 2021, and that 2023 earnings are above 2022. Mark-to-market, the probability that 2023 earnings are below 2022 is slightly higher now than it was three months ago, as a result of a slowing economy and war. Today, the consensus bottom-up analyst earnings estimates are for $230.19 in earnings, or 9.9% earnings growth for 2022 (left chart) above the $209.49 2021 earnings. In our judgment, 5% growth for 2022 is a reasonable base-case. In that scenario, earnings would be $220, and with the SP500 is currently trading around 18x forward earnings.   A range of 2022 earnings growth outcomes and price-to-forward earnings is shown on the right table.   Paying 22x about 10% earnings growth (with a belief 2023 earnings are above 2022 earnings) would drive 23% upside (right table).



Implied Upside/Downside of SP500

Price-to-Forward Earnings	2022E Earnings Growth					
	(10.0%)	(5.0%)	0.0%	5.0%	10.0%	15.0%
16x	(26.6%)	(22.5%)	(18.4%)	(14.3%)	(10.3%)	(6.2%)
17x	(22.0%)	(17.7%)	(13.3%)	(9.0%)	(4.7%)	(0.3%)
18x	(17.4%)	(12.8%)	(8.2%)	(3.6%)	1.0%	5.5%
19x	(12.8%)	(8.0%)	(3.1%)	1.7%	6.6%	11.4%
20x	(8.2%)	(3.1%)	2.0%	7.1%	12.2%	17.3%
21x	(3.6%)	1.7%	7.1%	12.4%	17.8%	23.1%
22x	1.0%	6.6%	12.2%	17.8%	23.4%	29.0%

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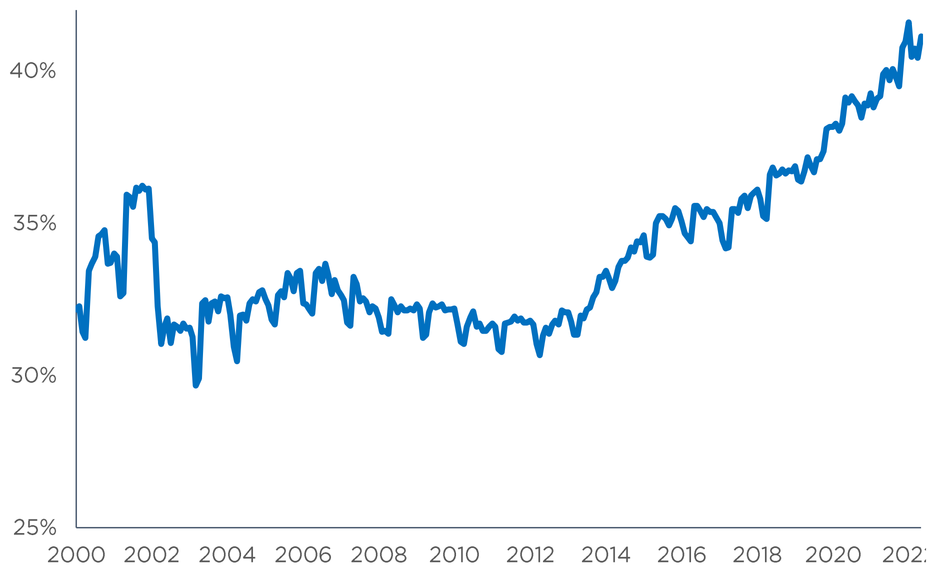
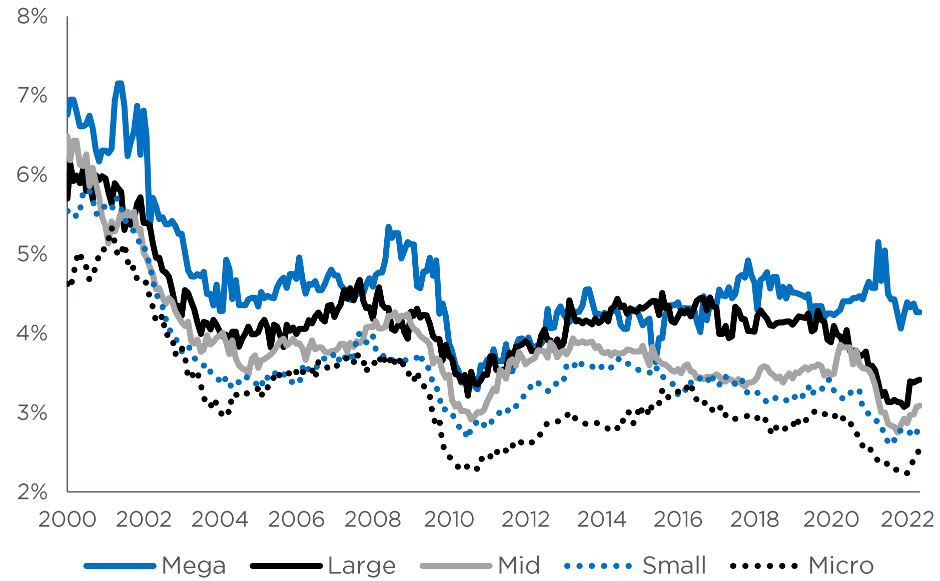
INVENTORY AND CAPITAL SPENDING ARE NOT BURDENS TO PROFITS

We do not believe that margins for US companies will mean-revert to a long-term average. Overall inventory is less of a risk than it was in the past, because over 40% of the top 3000 US equities now do not even have inventory (left chart). That is roughly 300 more stocks than 20 years ago. Moreover, we are still more likely to hear about shortages (semiconductor supply chain) than excesses in many areas of manufacturing today. Therefore, an inventory burn off or backlog cancellation seems highly unlikely to impede margin expectations resulting from higher factory absorption for the coming couple of quarters. Instead, restocking could drive higher factory utilization and margins for manufacturers. Excessive capital spending can also be bad. Recently, we have seen small increases in capital intensity (right chart), thought levels remain well below longer-term averages.

% of Top 3000 US Companies That Have Zero Inventory Dollars Through End-May, 2022



Capital Spending to Sales By Market Cap Group Through End-May, 2022



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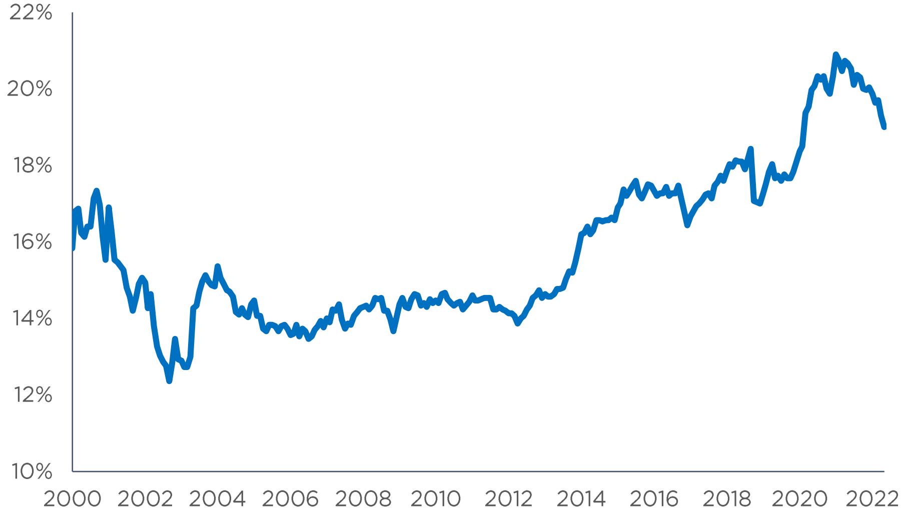
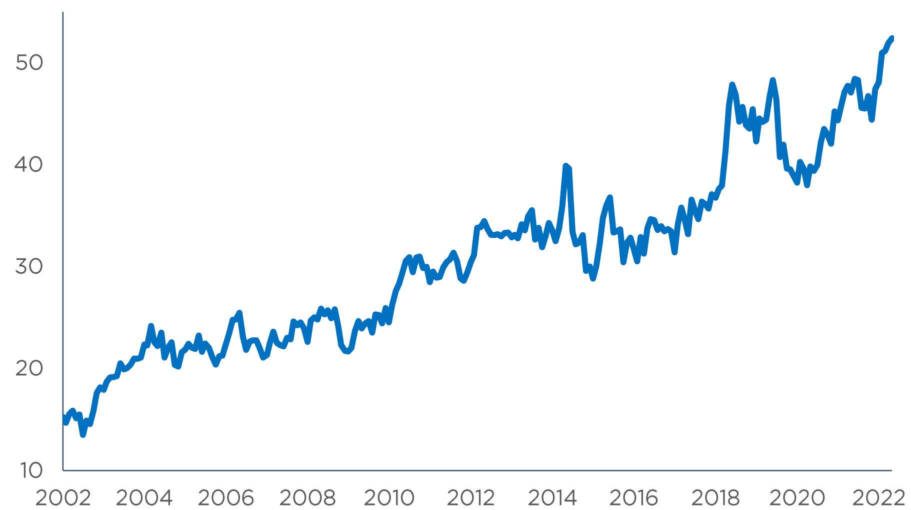
IS VALUATION DEFENSIBLE? CONSTITUENTS HAVE SHIFTED

Nearly 20%, or 600 of the biggest 3000 public US equities are currently in the Software & Services or Pharmaceuticals, Biotechnology, and Life Sciences industries (left). This has declined recently with their dramatic underperformance, but nonetheless that is substantially more than 20 years ago. Investors are buying long-dated potential growth, not current profitability. We think that the elevated market valuation is in part sensible because these faster-growing businesses are maintaining their growth status for close to the longest amount of time ever (right chart) with the average number of consecutive months a growth stock in the SP500 has been able to grow a record level of over 50 months straight.

Software Plus Biotechnology
Percentage of Companies in the Top 3000
Through End-May, 2022



Average Number of Consecutive Months
An SP500 Growth Stock Has Been in Growth Universe
Through End-May, 2022



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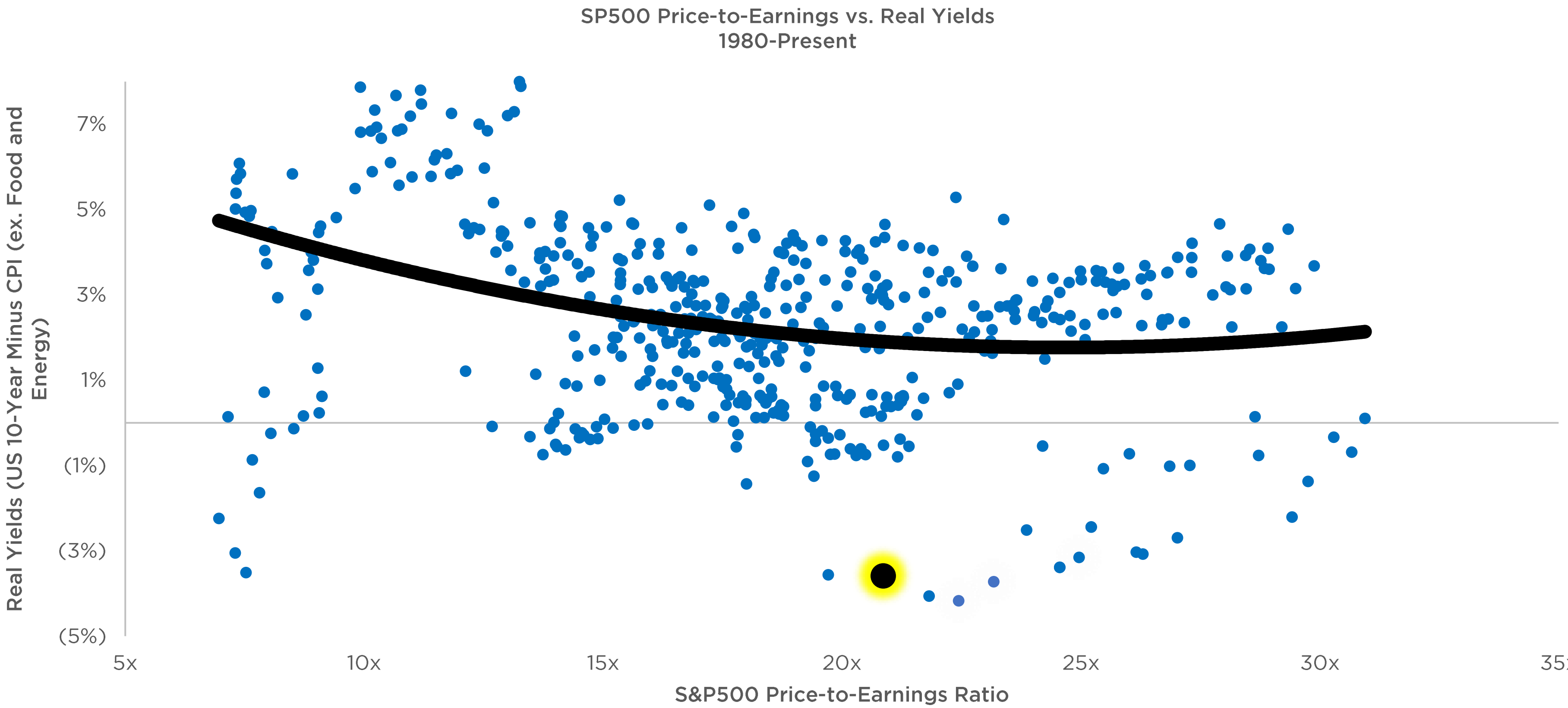
THE RELATIONSHIP BETWEEN REAL YIELDS AND MULTIPLES IS BROKEN

The interest rate environment is an important metric for assessing an appropriate price-to-earnings ratio for the overall market and individual stocks within it. Historically extreme real yields were accompanied by lower multiples because they were considered risk regimes. But when real-yields are negative, that are two clusters, as the market has determined that 10% minus 12% (an example of the 10-year yield minus CPI from the early 1980s) is different than 2.95% minus 6.5% (roughly today's figures). The US equity market offers 2% total yield (net buyback plus dividend), 2% growth from enhancement, and 3-5% organic growth, meaning the total return algorithm is 7-9%, which is far more attractive than other asset classes.



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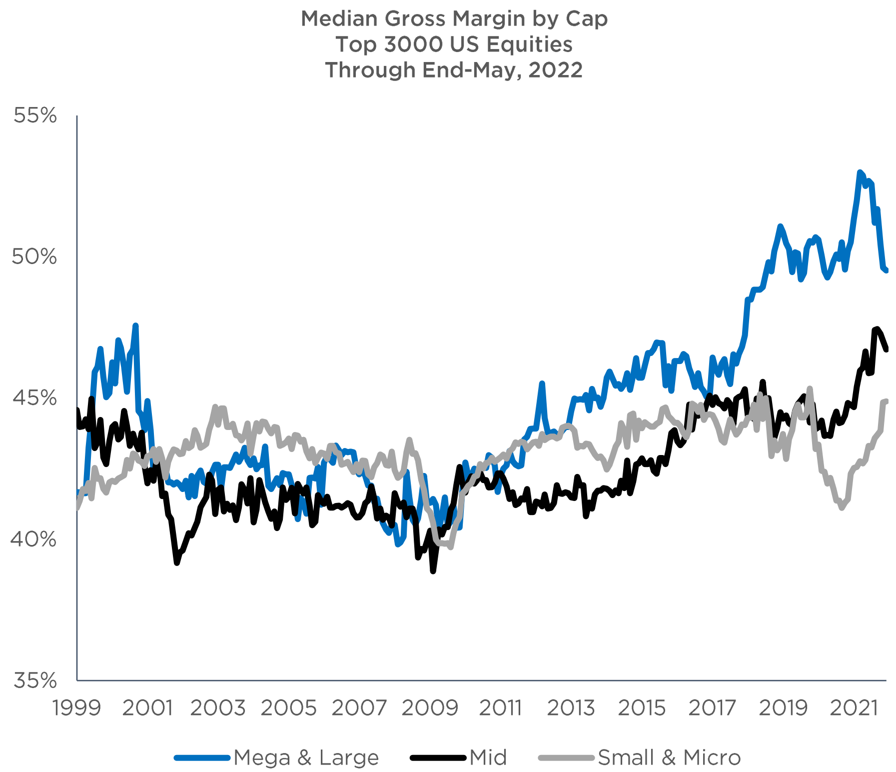
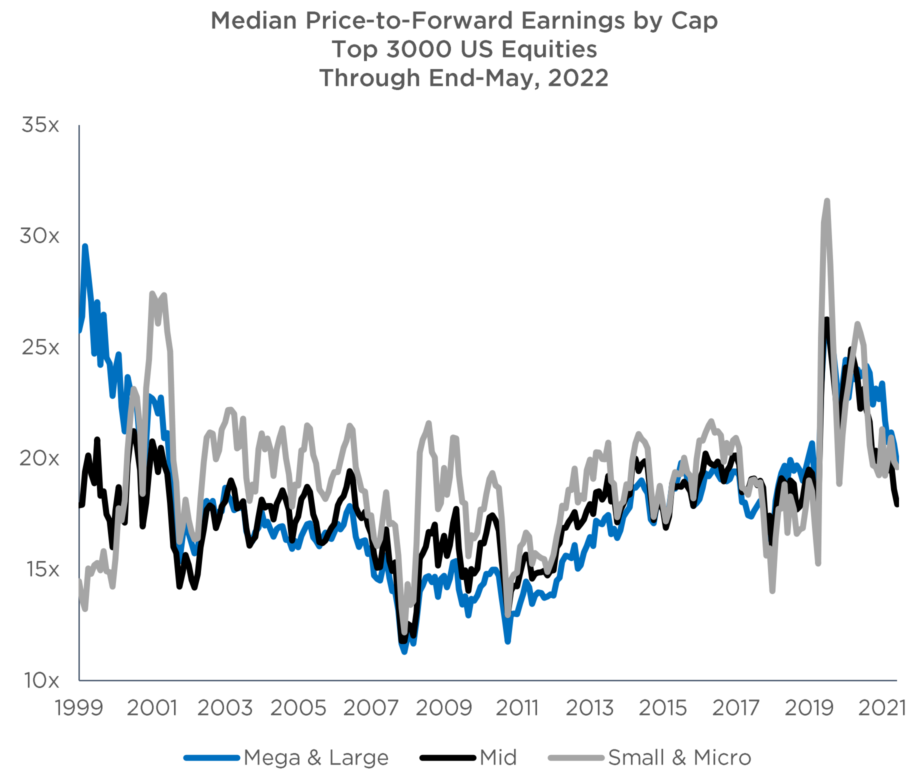
LARGE CAP MARGINS JUSTIFY HIGHER MULTIPLES

The median gross margin of large caps didn't dip during COVID but has started to rollover recently (left chart), potentially at least partially justifying above average price-to-forward earnings multiples for the median large cap stocks (right side). Small and micro-cap profitability still has more room for expansion, thought multiples remain elevated for the median smaller stock. Bears argue mega / large cap margins will collapse, but we see that as unlikely.





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2022 FULL YEAR NUMBERS ARE UP FOR THE S&P500 YTD

Earnings expectations are higher now 2.9% higher than they were on January 1st, despite the market pullback. Energy estimates are up the most, over 70%, and consumer discretionary, communication services and industrials are down the most since the start of the year.

Q1 2022 EPS Revisions: June 3, 2022 vs. December 31, 2021

Sector	1Q22E	2Q22E	3Q22E	4Q22E	2022E
S&P 500	3.4%	0.4%	3.2%	4.5%	2.9%
Energy	39.2%	89.7%	79.9%	74.9%	70.9%
Financials	2.0%	(2.6%)	1.0%	1.6%	0.5%
Health Care	5.8%	(4.0%)	(1.8%)	(1.8%)	(0.4%)
Materials	7.7%	14.8%	19.9%	24.4%	16.4%
Info Tech	7.6%	(1.6%)	0.8%	5.0%	3.0%
REITS	12.9%	6.4%	7.5%	4.4%	7.7%
Utilities	18.6%	(0.7%)	(0.6%)	(5.9%)	3.2%
Communication Services	(1.0%)	(11.5%)	(8.4%)	(6.7%)	(7.0%)
Consumer Staples	1.7%	(5.7%)	(4.5%)	(0.6%)	(2.4%)
Consumer Discretionary	(27.9%)	(20.4%)	(6.2%)	(1.5%)	(13.0%)
Industrials	(12.5%)	(4.4%)	(0.8%)	0.0%	(3.9%)

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EARNINGS EXPECTATIONS TROUGH IN Q2 AND ACCELERATE AFTER

Current bottom-up earnings expectations are for 9.9% growth for the SP500 for 2022. Expectations are that earnings will rise through 2022, except for in financials and communications services. Despite the industrials sector seeing the among the most negative earnings revisions of any sector in the market during Q1, we still see estimates as too optimistic in the second half of the year with over 20% earnings growth embedded in each quarter and 18.5% additional growth in 2023. Obviously, the energy and materials sectors will see strong growth as underlying commodities have materially risen.

Bottom-Up Analyst Earnings Growth Expectations
June 3, 2022

Sector	2021	1Q22E	2Q22E	3Q22E	4Q22E	2022E	2023E
S&P 500	47.0%	10.5%	5.1%	10.7%	13.2%	9.9%	9.2%
S&P ex-Financials	42.3%	18.8%	11.7%	14.1%	16.1%	15.1%	8.3%
Consumer Discretionary	70.3%	(29.1%)	(3.9%)	28.2%	39.3%	7.9%	32.0%
Consumer Staples	6.5%	6.4%	(1.6%)	8.0%	4.9%	4.4%	7.9%
Energy	N/A	282.8%	203.6%	90.8%	42.3%	117.9%	(13.7%)
Financials	71.9%	(19.5%)	(21.7%)	(5.8%)	(1.1%)	(12.6%)	14.2%
Health Care	22.6%	17.9%	4.8%	0.4%	3.2%	6.4%	0.3%
Industrials	78.6%	30.6%	23.8%	34.8%	50.6%	34.8%	18.5%
Info Tech	32.2%	15.2%	4.1%	7.3%	13.0%	10.0%	12.6%
Materials	75.3%	48.8%	18.1%	15.3%	20.4%	23.9%	(5.8%)
Communication Services	38.7%	(1.3%)	(11.6%)	(3.3%)	5.8%	(2.6%)	14.0%
Utilities	5.0%	27.9%	(12.0%)	(1.4%)	12.5%	5.8%	3.7%
REITS	24.7%	23.3%	10.6%	15.4%	(7.9%)	9.0%	4.4%

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SP500 INDEX CHANGES HAVE A BIG IMPACT ON ITS PERFORMANCE

We analyzed the additions and drops to the SP500 over the last 20+ years. We found that on average 5.5% of the stocks change each year and the cumulative impact is substantial. Few investors focus on the importance of their key benchmark being a constantly enhanced moving target.

Valuation boost: The overall impact of constantly adding companies that grow faster and have higher profitability ultimately impacts the valuation of the market. Over the last 20 years, the average price-to-sales for a stock added to the SP500 is 3.2x at the time of inclusion vs. only 1.5x sales for the average stock at the time of being dropped, with much of that enormous differential created in the last decade.

Aggregate impact: Over the last decade, the impact of the of these add / drops alone has boosted earnings growth by 2.2% annually, and the market multiple by 0.18x. This partially explains higher market valuations today than history, and the challenges of beating the SP500, which is really a constantly enhanced moving target.

Investment conclusion: In order to capture some of the performance of the additions and avoid that of the deletions, we created two proprietary "potential add and potential drop" baskets to the SP500. This is not a predictive model where we back-test whether names were ultimately included, and names in both baskets could already be in the official index. The point is to capture names that are just smaller than the SP500 cut-off on market capitalization that are not melting ice cubes as longs, and short those that are melting ice cubes. Our "potential add" basket strongly outperforms the SP500, whereas our "potential drops" basket underperforms. We think adding these basket is a good structural alpha- generative hedge. Please let us know if you are interested.

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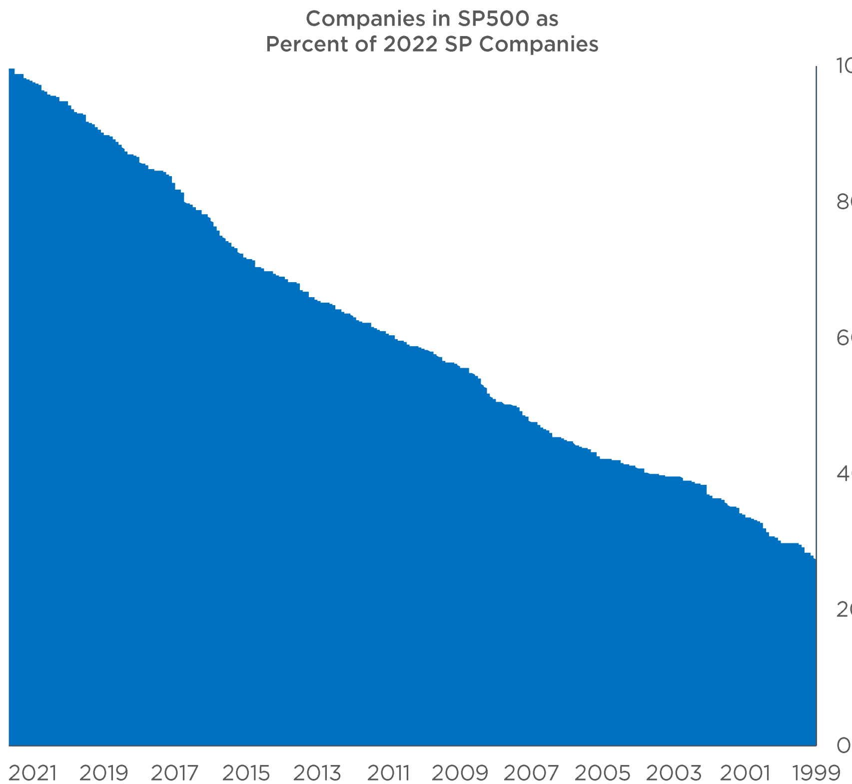
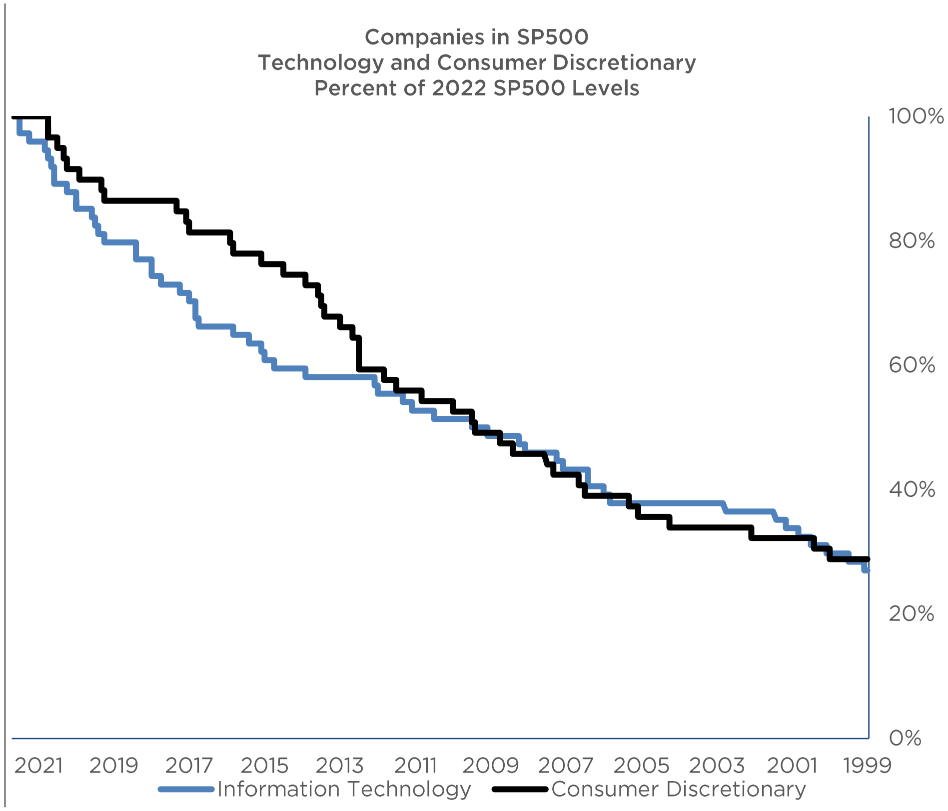
75% OF THE SP500'S CONSTITUENTS WERE NOT THERE 20 YEARS AGO

The impact of this constant replacement of existing / poorer companies with new / stronger companies has a massive impact on the market constituents over time. In fact, only 25% of the companies in the SP500 today were in the SP500 in 1999, and about half are new since 2007 (left chart). In certain more idiosyncratic sectors where many managers purposely go to generate alpha, like technology and consumer discretionary, nearly 80% of the companies in the index today were not there 20 years ago (right chart). We have heard some more experienced portfolio managers bemoan how experience sometimes seems anti-correlated with success in recent years, and perhaps this is partially merited by the massive turnover in companies since these investors originally formulated their investment heuristics.





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THE IMPACT OF CONSTANTLY IMPROVING THE INDEX IS MASSIVE

The impact of constantly improving the index might seem small on a short-term basis but over time the constant upward bias of adding faster growing and more profitable names makes a big difference. Over the last 20 years, the SP500 has grown revenue 6.6% and earnings 11.5% per annum ex-Financials. Stocks being added to the index grow earnings 31.4%, vs. those being deleted having declining earnings of 15% (left chart). Additions / deletions alone add 2% per year to the SP50) earnings growth. Since 2012 (right chart), the average addition traded at 4.13x sales vs. the average deletion at 1.26x and a market at 2.2x sales.

Avg Annual Contribution of Adds/Drops to SP500 Attributes, Last 20 Years

Attribute	SP500	Adds	Drops	Net Contribution of Adds/Drops
YoY Revenue Growth	6.6%	13.7%	1.2%	0.6%
Gross Margin	47.8%	42.7%	42.6%	0.1%
Net Margin	11.5%	9.3%	5.0%	0.2%
YoY Earnings Growth	10.6%	31.4%	(15.0%)	2.2%
Price-to-Forward-Sales	2.04x	3.20x	1.50x	0.16x
Price-to-Forward-Earnings	17.96x	22.05x	18.78x	0.18x

Avg Annual Contribution of Adds/Drops to SP500 Attributes, Last 10 Years

Attribute	SP500	Adds	Drops	Net Contribution of Adds/Drops
YoY Revenue Growth	5.3%	11.3%	(1.4%)	0.6%
Gross Margin	49.2%	46.6%	42.7%	0.2%
Net Margin	13.2%	9.7%	5.7%	0.2%
YoY Earnings Growth	11.2%	29.3%	(12.5%)	2.0%
Price-to-Forward-Sales	2.20x	4.13x	1.26x	0.21x
Price-to-Forward-Earnings	18.42x	26.78x	17.64x	0.44x

Note: Metrics ex-financials

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SMALL CAP BEATS LARGE WHEN OUR INDICATORS ARE INCREASING

We evaluated the performance of small vs. large cap US equities in the various regimes of our macro gauges. For the past 20 years we show how often each gauge indicates conditions are increasing, decreasing, positive, or negative, or whether it is in a "no trend" in between stage. We also show the count and percentage of how often small caps beat large caps under each macro condition. The left side shows industrial activity, consumer activity, and economic activity, the right oil, currencies, corporate profitability, and financial conditions. Our primary observation is that in general, change matters more than level: small outperforms large **especially in times when are indicators are increasing (with the exception of financial conditions, when small more often outperforms large when our indicator is decreasing (conditions are tightening),** with this slope having a large impact than solely looking at whether conditions are favorable moment-in-time. This effect is most pronounced when looking at industrial and consumer activity. Today's conditions are shaded in gray.

Small/Large Regime Counts by Trivariate Indicator Since 2002

Indicator	Regime	Negative/ Decreasing	Negative/ Increasing	Positive/ Decreasing	Positive/ Increasing	No Trend
Industrial Activity	Small Beating Large	12	10	20	22	67
	Small Lagging Large	13	2	19	19	57
	% Small Beating Large	48%	83%	51%	54%	54%
Consumer Activity	Small Beating Large	8	13	25	40	45
	Small Lagging Large	10	5	26	31	38
	% Small Beating Large	44%	72%	49%	56%	54%
Economic Activity	Small Beating Large	2	0	38	32	59
	Small Lagging Large	2	2	30	25	51
	% Small Beating Large	50%	0%	56%	56%	54%

Small/Large Regime Counts by Trivariate Indicator Since 2002

Indicator	Regime	Decreasing	Increasing	No Trend
Oil	Small Beating Large	59	58	14
	Small Lagging Large	50	50	10
	% Small Beating Large	54%	54%	58%
Currencies	Small Beating Large	64	54	13
	Small Lagging Large	60	41	9
	% Small Beating Large	52%	57%	59%
Corporate Profitability	Small Beating Large	33	44	54
	Small Lagging Large	30	33	47
	% Small Beating Large	52%	57%	53%
Financial Conditions	Small Beating Large	56	55	20
	Small Lagging Large	38	55	17
	% Small Beating Large	60%	50%	54%

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SMALL CAP COMPOUNDERS COULD BE GOOD LONG IDEAS

Long ideas in small cap with consistent gross margin expansion are shown below.

Small Cap Compounders, As of End-May, 2022

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
DBX	Dropbox, Inc.	Software	7.77
LSCC	Lattice Semiconductor Corporation	Semiconductors & Semiconductor Equipment	7.16
AN	AutoNation, Inc.	Specialty Retail	6.97
LITE	Lumentum Holdings Inc.	Communications Equipment	5.94
SYNA	Synaptics Incorporated	Semiconductors & Semiconductor Equipment	5.87
AZTA	Azenta, Inc.	Life Sciences Tools & Services	5.70
IRDM	Iridium Communications Inc.	Diversified Telecommunication Services	4.75
ALTR	Altair Engineering Inc.	Software	4.38
PRFT	Perficient, Inc.	IT Services	3.39
VRNT	Verint Systems Inc.	Software	3.30
MTH	Meritage Homes Corporation	Household Durables	3.13
CCOI	Cogent Communications Holdings, Inc.	Diversified Telecommunication Services	2.81
AIMC	Altra Industrial Motion Corp.	Machinery	2.55
SPNS	Sapiens International Corporation N.V.	Software	1.40
AVID	Avid Technology, Inc.	Technology Hardware, Storage & Peripherals	1.32

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SUMMARY OF VIEWS ON CYCLICALS - INVESTMENT CONCLUSIONS

Valuation and margins: On valuation – specifically price-to-forward earnings relative to the broader SP500 - building products, chemicals, homebuilders, metals, oil, gas & consumable fuels, and specialty retail have basically never been cheaper. On profitability, chemicals, machinery, homebuilders, metals & mining, semiconductors and semiconductor capital equipment, building products, and specialty retail have peak or record net margins. Machinery and building products are now expensive on price-to-sales, with machinery at multi-decade highs.

Earnings scenario analysis: In aggregate, it appears the three most severe prior troughs reduced earnings for these cyclical industries between one-third and one half, though in most cases earnings typically strongly grow following these declines. If we assume an earnings decline of 33% for each industry, and a 10% decline in earnings for the overall market, then oil, gas & consumables, homebuilders, specialty retail, metals & mining, chemicals and building products all still look cheap. Hotels, restaurants & leisure, electrical equipment, and machinery do not look attractive, while semiconductors (which we would argue merit a premium to the market for other reasons) would still trade at a slight discount to the market in that scenario. Oil and gas stocks would trade at 8.6x forward earnings if their estimates are cut by a third. **Machinery stocks would trade near 20x under the same assumptions. We continue to recommend long energy and short machinery.**

Except for airfreight & logistics, estimates are forecasted to rise for the other 12 cyclical industries. A reset is likely as recessionary fears grow. Our judgment is that the potential for a material earnings decline in the near-term (between now and year end) and the medium-term (2023-2024) varies by industry. We think **autos, electrical equipment, hotels, restaurants & leisure, machinery and specialty retail are more likely to see a 33% earnings hit earlier than the other industries. As such, we prefer chemicals, metals & mining, oil, gas, & consumable fuels, and semiconductors & semi caps believing they have lower risk of an earnings hit this year.**

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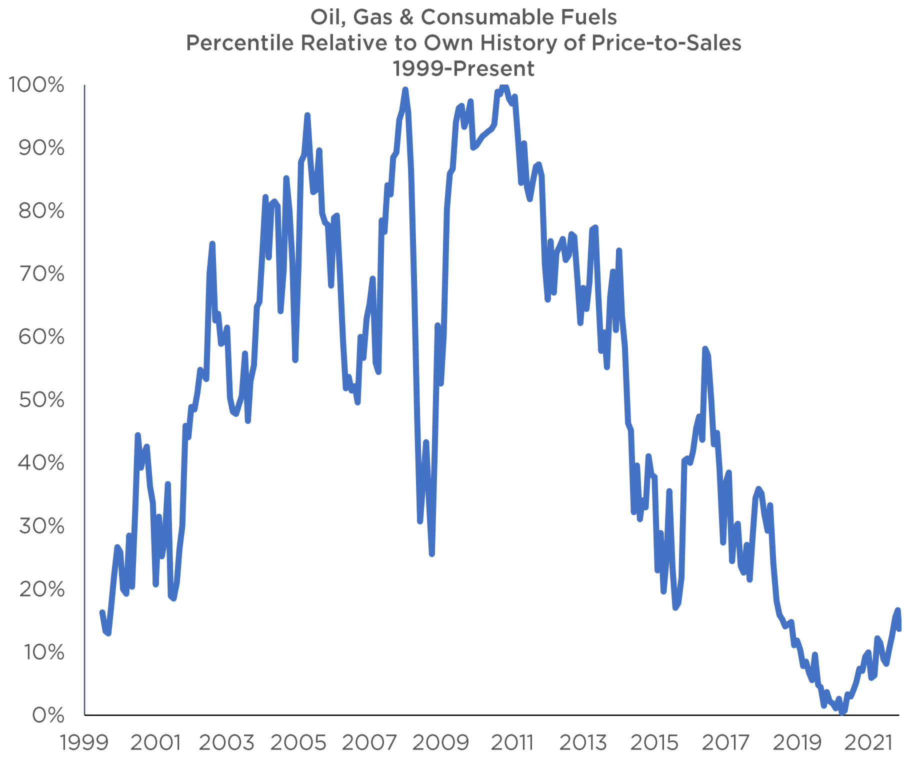
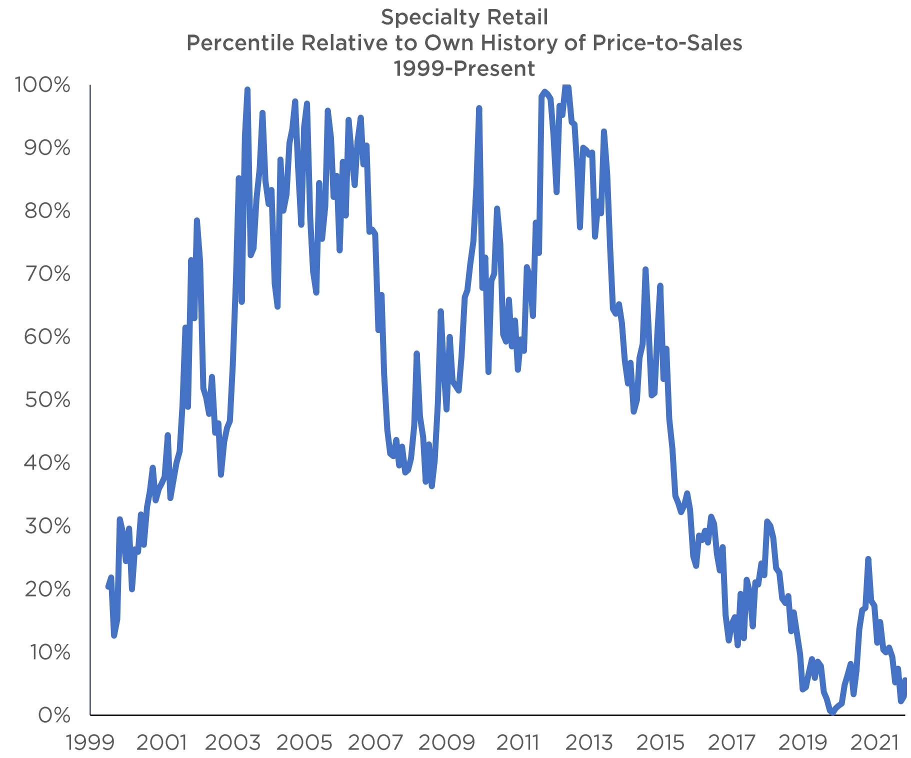
ENERGY AND SPECIALTY RETAIL ARE CHEAP ON SALES

Despite the outperformance of energy stocks (left) they remain compelling cheap on price-to sales, more expensive 80% of the time in their history. For specialty retail (right) valuation is at a trough, though macro conditions and industry challenges likely make this more structural than cyclical in many cases.





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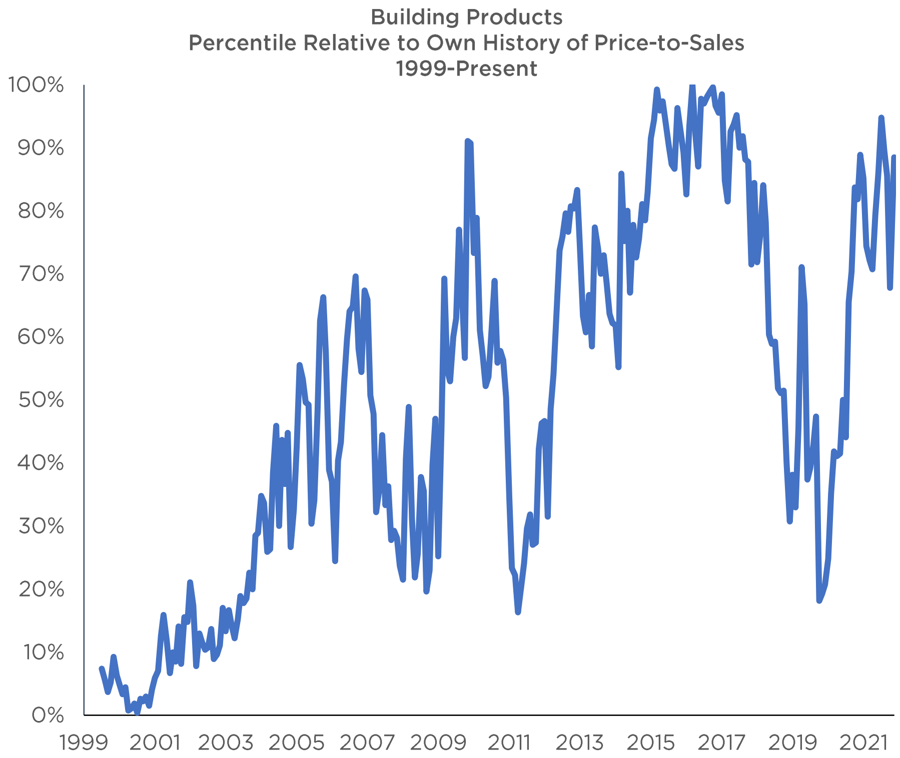
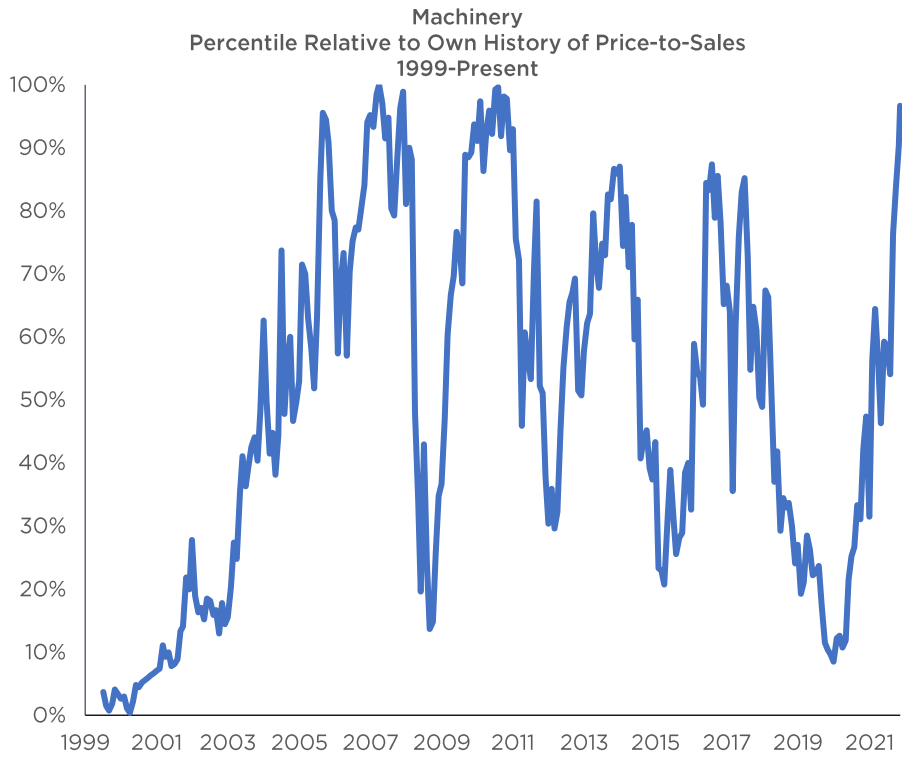
BUILDING PRODUCTS AND MACHINERY ARE EXPENSIVE ON SALES

On price-to-sales, building products look relatively more expensive (left) and machinery stocks have never been more expensive (right). It seems like a disconnect to us that energy and metals remain so cheap while machinery is so expensive, given many machinery companies will face margin pressure as their costs rise.





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PRIOR CYCLICAL DOWNTURNS ARE USEFUL FOR CONTEXT

The most severe prior cyclical downturns reduced earnings between one-third and one-half. If we assume an earnings decline of 33% for each cyclical industry, and a 10% decline in earnings for the overall market, then oil, gas & consumables, homebuilders, specialty retail, metals & mining, chemicals and building products all still appears cheap in that scenario. Hotels, restaurants & leisure, electrical equipment, and machinery do not look attractive, while semiconductors (which we would argue merit a premium to the market for other reasons) would still trade at a slight discount to the market in that scenario. This supports our long energy / materials and short industrials calls based on relative estimate achievability and risk to forward estimates. Oil, Gas and Consumable fuels would be at only 8.6x forward earnings if their estimates are cut by a third whereas machinery would be at 19.7x under the same assumptions.

Historical Average Price-to-Forward Earnings
Vs. Current Price-to-Forward Earnings
Vs. Price-to-Forward Earnings Assuming Earnings/Price Declines

Industry	Avg. Price-to-Forward Earnings At Historical Troughs	Current Price-to-Forward Earnings	Price-to-Forward Earnings Fixed Price 33% Earnings Decline	Price-to-Forward Earnings 33% Earnings Decline 10% Price Decline
Oil, Gas & Consumable Fuels	18.0x	8.1x	12.1x	10.9x
Household Durables	16.9x	8.3x	12.4x	11.2x
Specialty Retail	25.1x	9.1x	13.7x	12.3x
Metals & Mining	22.6x	10.4x	15.6x	14.0x
Chemicals	16.3x	14.5x	21.7x	19.5x
Building Products	18.6x	15.7x	23.6x	21.2x
Automobiles & Auto Components	39.2x	19.0x	28.5x	25.6x
Airlines & Airfreight & Logistics	19.2x	21.7x	32.5x	29.3x
Machinery	21.0x	25.9x	38.9x	35.0x
Semis & Semis Equipment	24.6x	37.3x	55.9x	50.3x
Electrical Equipment	21.2x	8.1x	12.1x	10.9x
Hotels, Restaurants & Leisure	29.9x	8.3x	12.4x	11.2x
Energy Equipment & Services	10.3x	9.1x	13.7x	12.3x

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THE NEXT 2 YEARS: OUR JUDGMENT VS. THE SELL-SIDE CONSENSUS

Except for airlines / airfreight & logistics, analysts are still projecting earnings growth for all 13 cyclical industries. We show our judgment about a near-term (between now and year end) and medium-term (2023-2024) collapse in earnings below. Our view is autos, electrical equipment, hotels, restaurants and leisure, machinery and specialty retail are more likely to see a 33% earnings hit earlier than the other industries. We prefer chemicals, metals & mining, oil, gas, & consumable fuels, and semiconductors & semi caps as having lower risk of a major earnings hit this year.

Consensus and Trivariate Views
By Cyclical Sector

			Is a 33% or More Earnings Decline Likely?	
Industry	Consensus View	Comment on Consensus	Trivariate Judgment Next 12 Months	Trivariate Judgment 2023-2024
Airlines & Airfreight & Logistics	Negative to Positive	(30B) a year ago to 15B now	Unlikely	Likely
Automobiles & Auto Components	119.7%	From 15b to 33B, but peak of 36B was 2/22	Possible	Likely
Building Products	56.1%	From 10b to 16b in last year	Unlikely	Likely
Chemicals	90.2%	1-year expectations have doubled in last year	Unlikely	Possible
Electrical Equipment	18.8%	Estimates are down 10% in last month	Possible	Likely
Energy Equipment & Services	Less Negative	More than (50b) in 2020 to (3b) and improving now	Unlikely	Likely
Hotels, Restaurants & Leisure	Negative to Positive	(27B) a year ago to 7b now	Possible	Likely
Household Durables	44.6%	Expectations continue to expand	Unlikely	Likely
Machinery	38.4%	27B to 37B YoY but down from 40B 3 months ago	Possible	Likely
Metals & Mining	362.3%	Estimates have doubled YoY and still rising	Unlikely	Possible
Oil, Gas & Consumable Fuels	Negative to Positive	(110B) in March 2021 to 105B now and risng	Unlikely	Possible
Semiconductors & Semiconductor Equipment	53.8%	Estimates continue to rise	Unlikely	Possible
Specialty Retail	43.2%	Flattish last few months	Possible	Likely

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SUMMARY OF VIEWS ON GROWTH STOCKS

- We analyzed 20-,10-,5-,3-, and 1-year revenue growth trends, as well as the forward revenue estimates for every stock surviving those horizons and grossed up the bottom-up data for every sub-industry, industry, and sector over time. Over the trailing 10-years, biotech, media, internet retail, software, and health care technology were the fastest growing sub-industries. Energy equipment and services, gas, electric utilities, multi-utilities, and airlines were the slowest growing. When we assess the 12-month forward revenue growth estimates vs. these 10-year trends, airlines, oil, gas & consumable fuels, energy equipment & services, hotels, restaurants, and leisure, and semiconductors are forecasted to grow most quickly vs. history. Our judgment is that the low 10-year growth in airlines and energy correlated to underinvestment that is now the reason these industries are likely to grow above trend for the foreseeable future. We also analyzed prior revenue growth corrections to see where valuations are more defensible if this occurs.
- There is a non-linear relationship between revenue growth and relative price-to-sales multiples – the “Double Whammy” is identifying stocks that will not only grow faster(slower) but also begin to command a higher (lower) multiple – long / short stock ideas are shown on slide 36.
- We analyzed attributes associated with compounding and found that sustained gross margin growth produces the highest level of subsequent stock performance, more than sustained revenue growth, net margin growth, earning per share growth, and stock performance. Attributes associated with identifying “melting ice cubes” are different – what matters is accruals and prior weak stock performance relative to peers.
- New CEOS for expensive growth stocks typically underperform.

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A 20-YEAR HISTORICAL VIEW OF REVENUE GROWTH BY INDUSTRY

Peak-to-trough: We analyzed the last five peak-to-trough revenue declines for every industry in the last 25 years for context. Autos, energy, and food, beverages & tobacco historically have the biggest declines, while commercial services, capital good and retailing the lowest. We were surprised to see this for food, beverages & tobacco, an area we see high valuation, rising input costs, and a strong dollar as directional negatives. We could see autos capital goods, software, and retailing have revenue pullbacks as severe as the last five biggest declines, but most industries will fare better this cycle.

Valuation: Expectations about future revenue growth rates and profitability drive price-to-sales levels and changes. We compared trailing and forward price-to-sales multiples to provide context around today's valuation levels and "implied" multiples various scenarios. Biotech and pharma look cheap, and autos expensive in this scenario. While obviously this is an academic exercise and underlying trends evolve, we think the future about growth is particularly uncertain right now, and the context around historical growth and peak-to-trough declines is instructive.

Conclusion: When canvassing historical growth rates, expectations, peak-to-trough declines and current valuations, we see some investment opportunities.

Buys: Airlines, biotech, metal and mining, and energy.

Sells: Machinery, food, beverages & household products, autos, software

If you are interested in the underlying stock ideas or data, please email us.

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RELATIVE TO HISTORY, BIOTECH EXPECTATIONS LOW, AIRLINES HIGH

We analyzed long-term revenue growth trends on a bottom-up basis. Biotech expectations are low vs. history, and airlines and energy are high. These industries have the lowest 10-year trailing revenue growth of any sub-industries, and that translated to underinvestment that now drives growth. Biotech expectations now seem depressed.

Historical Revenue Growth Over Various Horizons
Versus 1y Fwd. Revenue Growth
Sub-Industries With Largest and Smallest Differentials

Sub-Industry	10y	5y	3y	1y	1y Fwd.	Delta of Fwd Estimate vs. 10y Revenue Growth
Biotechnology	19.6%	21.2%	23.1%	27.8%	6.9%	(12.7%)
Transportation Infrastructure	7.2%	(1.0%)	(10.7%)	(27.4%)	0.0%	(7.2%)
Tobacco	3.5%	5.6%	4.8%	7.6%	(3.2%)	(6.6%)
Pharmaceuticals	14.3%	9.5%	10.6%	14.5%	8.0%	(6.3%)
Paper & Forest Products	3.4%	4.1%	3.8%	15.3%	(2.1%)	(5.5%)
Independent Power & Renewable Electricity Producers	12.8%	5.6%	5.3%	10.2%	11.0%	(1.8%)
Air Freight & Logistics	8.2%	10.3%	9.8%	20.4%	6.5%	(1.7%)
Electric Utilities	2.1%	2.6%	2.2%	7.4%	0.5%	(1.6%)
Interactive Media & Services	19.4%	19.4%	18.2%	25.2%	18.1%	(1.2%)
Diversified Telecommunication Services	4.2%	4.4%	2.8%	4.0%	3.3%	(1.0%)
Specialty Retail	5.7%	5.7%	6.8%	19.6%	4.8%	(0.9%)
Software	15.8%	17.2%	18.4%	19.1%	18.9%	3.1%
Machinery	4.3%	5.2%	2.9%	7.6%	8.8%	4.5%
Metals & Mining	3.8%	8.5%	4.1%	18.4%	8.7%	4.9%
Entertainment	8.4%	8.4%	8.5%	10.8%	17.6%	9.2%
Semiconductors & Semiconductor Equipment	7.4%	11.7%	10.2%	23.4%	16.6%	9.2%
Hotels, Restaurants & Leisure	4.6%	3.1%	0.8%	8.8%	20.0%	15.3%
Energy Equipment & Services	0.9%	0.1%	-8.3%	-16.6%	19.3%	18.4%
Oil, Gas & Consumable Fuels	6.9%	11.5%	5.3%	17.3%	27.8%	21.0%
Airlines	2.7%	-2.4%	-7.8%	2.3%	33.7%	31.0%

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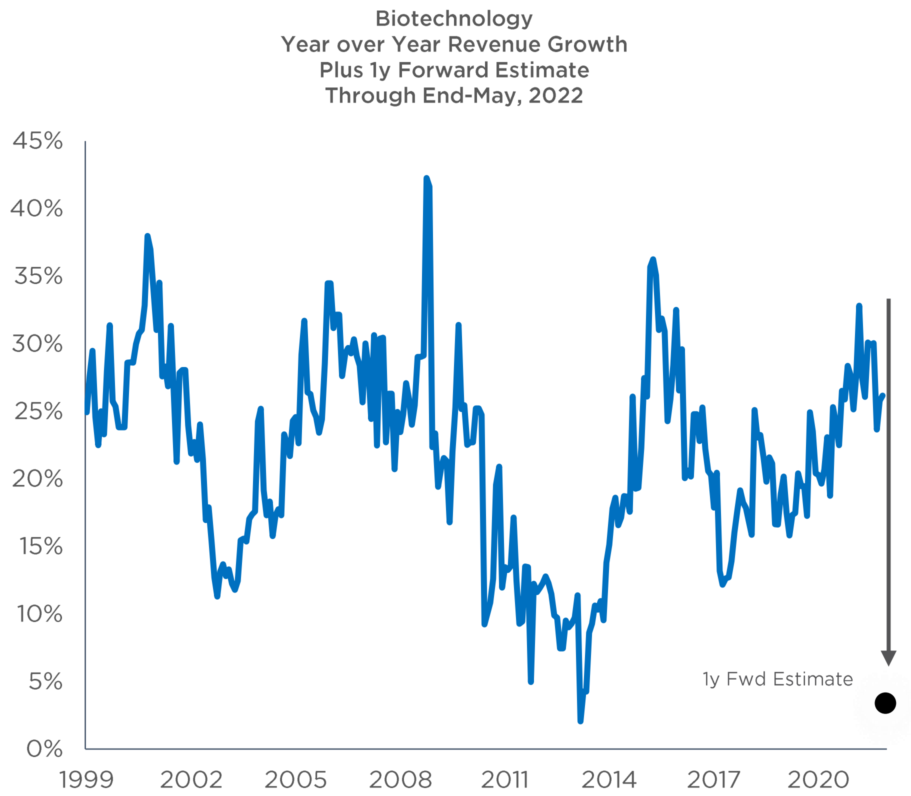
ESTIMATE ACHIEVABILITY BETTER FOR BIOTECH THAN SOFTWARE

Among the historically fastest growing industries, biotechnology (left) revenue growth expectations for the next 12-month are near the lowest they have been in two decades. On the other hand, software forward expectations are nearly at the trailing 10-year average, though embedding a decline from last year. In our judgment, growth expectations are more achievable for biotech than software.



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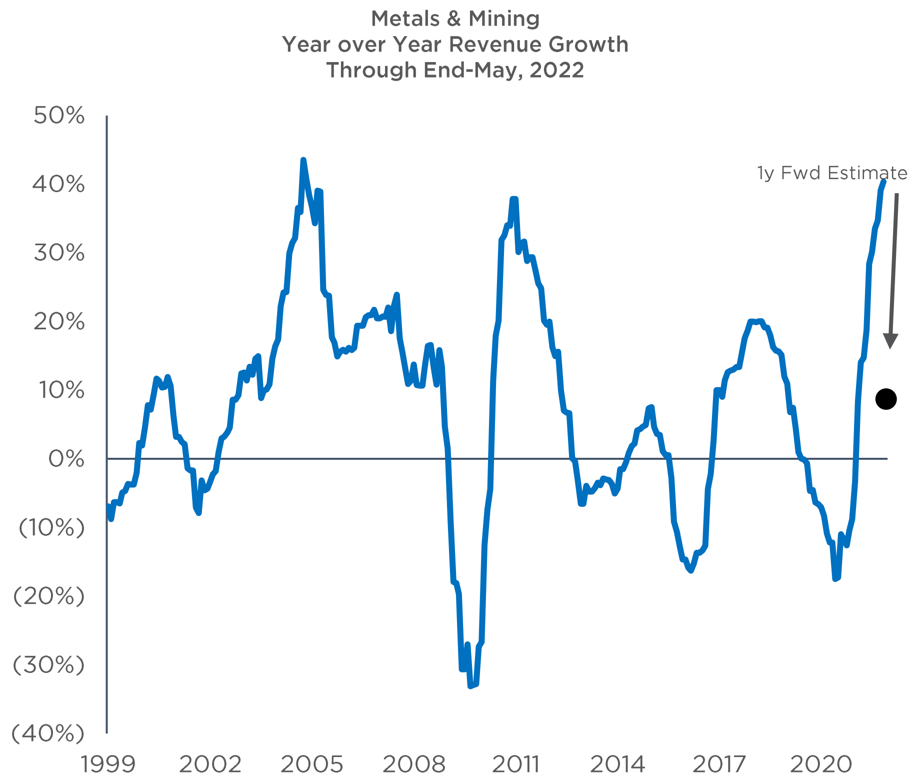
MACHINERY EXPECTATIONS SEEM HIGH, METALS & MINING LOW

We see a disconnect between expectations for machinery (left), which remain relatively high vs. history, and metals & mining where expectations materially decline (right). Our judgment is relative estimate achievability is far better for metals and mining than machinery and we recommend positioning our portfolio that way.



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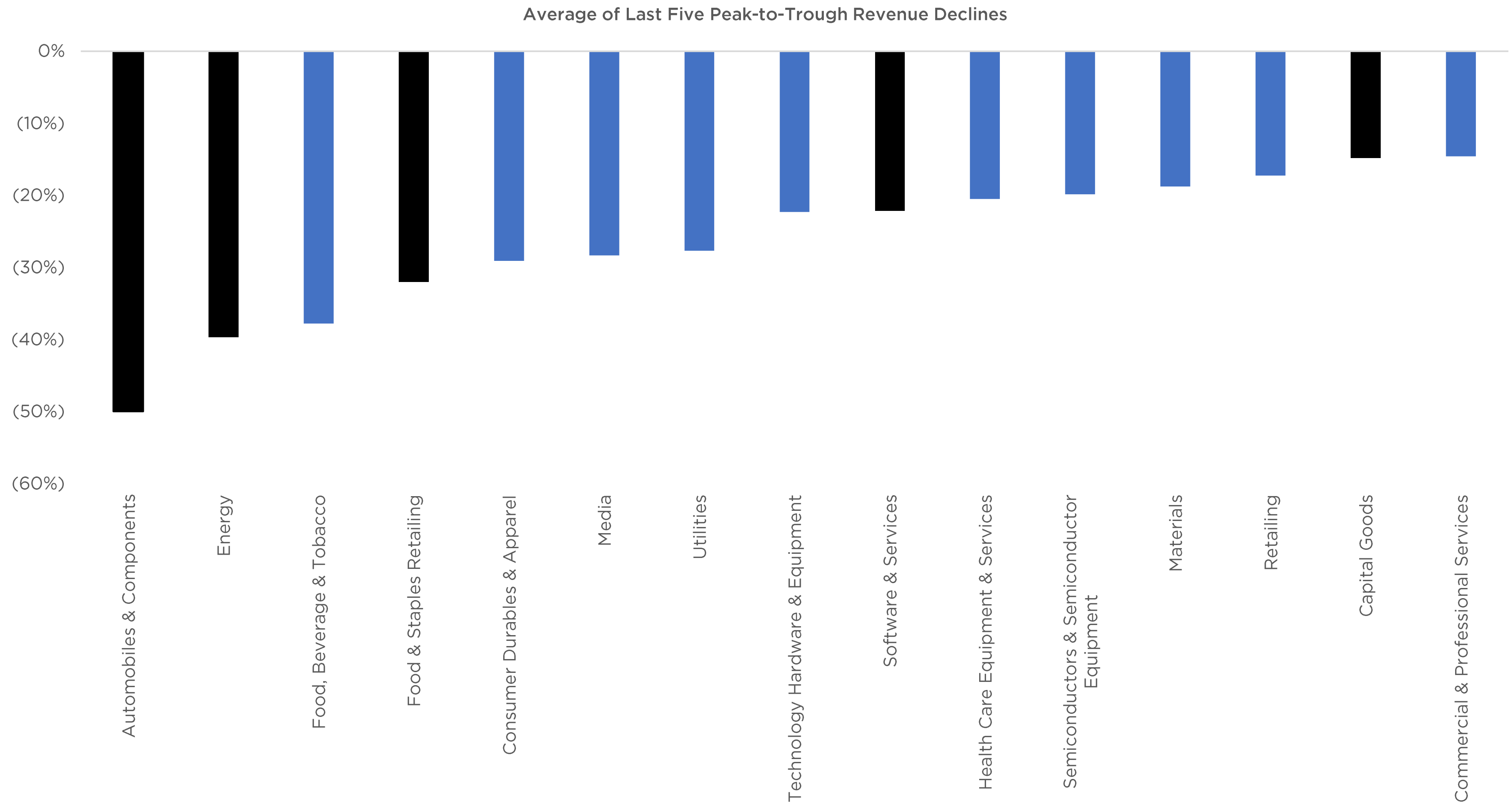
BIG CYCLICAL CRASHES ARE NOT IN THE ESTIMATES

We analyzed the last five peak-to-trough revenue declines for every industry in the last 25 years for context. Autos, energy, and food, beverages & tobacco historically have the biggest declines, while commercial services, capital good and retailing the lowest. We could see autos, capital goods, software, and retailing have revenue pullbacks as severe as the last five biggest declines, but most industries will fare better this cycle.



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WHAT'S IN THE PRICE IF THERE'S REVENUE GROWTH MEAN-REVERSION

Expectations about the future revenue growth rate and the profitability drive the price-to-sales levels and changes. We compared the long-term price-to-sales and forward price-to-sales to unemotionally evaluate today's valuation levels vs. history for each industry and get an "implied" multiple under the conditions that history's growth rates are more accurate than the current estimates. Biotech and pharma looks cheap, and autos expensive in this scenario. Investors can use any historical time frame they want to gauge the "normal" growth rates by contacting us.

Implied Price-to-Sales Growth Over Various Horizons of Long-Term Revenue Growth Versus 1y Fwd. Price-to-Sales
Sub-Industries With Largest and Smallest Deltas

Sub-Industry	Long Term Implied (20y) Price-to-Sales	Medium Term Implied (5yr) Price-to-Sales	Forward Price-to-Sales	20y Implied Minus Forward Delta	5y Implied Minus Forward Delta
Biotechnology	15.84x	15.90x	18.03x	(2.20x)	(2.13x)
Pharmaceuticals	6.68x	7.15x	7.25x	(0.57x)	(0.10x)
Tobacco	4.16x	4.12x	4.49x	(0.33x)	(0.37x)
Transportation Infrastructure	1.80x	2.08x	2.06x	(0.26x)	0.02x
Water Utilities	5.59x	5.69x	5.74x	(0.15x)	(0.04x)
Wireless Telecommunication Services	1.10x	1.25x	1.23x	(0.13x)	0.01x
Multi-Utilities	2.45x	2.54x	2.56x	(0.11x)	(0.02x)
Electric Utilities	2.30x	2.35x	2.40x	(0.10x)	(0.05x)
Diversified Telecommunication Services	1.30x	1.33x	1.34x	(0.04x)	(0.02x)
Communications Equipment	1.68x	1.74x	1.72x	(0.04x)	0.02x
Airlines	0.62x	0.68x	0.50x	0.12x	0.18x
Electrical Equipment	2.65x	2.70x	2.51x	0.14x	0.19x
Software	5.61x	5.51x	5.43x	0.18x	0.08x
Life Sciences Tools & Services	5.57x	5.46x	5.39x	0.18x	0.07x
Hotels, Restaurants & Leisure	1.80x	1.87x	1.61x	0.20x	0.26x
Entertainment	2.53x	2.53x	2.33x	0.20x	0.20x
Oil, Gas & Consumable Fuels	2.15x	2.23x	1.94x	0.21x	0.28x
Semiconductors & Semiconductor Equipment	3.98x	3.91x	3.75x	0.23x	0.16x
Construction Materials	2.92x	2.90x	2.66x	0.25x	0.24x
Automobiles	5.32x	5.07x	5.06x	0.26x	0.01x

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BIOTECH SEEMS FAR CHEAPER THAN SOFTWARE

While biotechnology stocks are always about safety and efficacy of their potential pipeline and long-term growth, more than the current sales, the median stock's price to sales has still fallen to trough levels (left). On the other hand, software valuations are still materially above longer-term trends (right). Given so many software business were selling products to each other, and trends have slowed, we wouldn't be surprised to see more relative valuation compression from here for software, particularly because so many of the companies still do not make money even with reasonably high current revenue.

Biotechnology
Price-to-Sales
Through End-May, 2022

Software
Price-to-Sales
Through End-May, 2022

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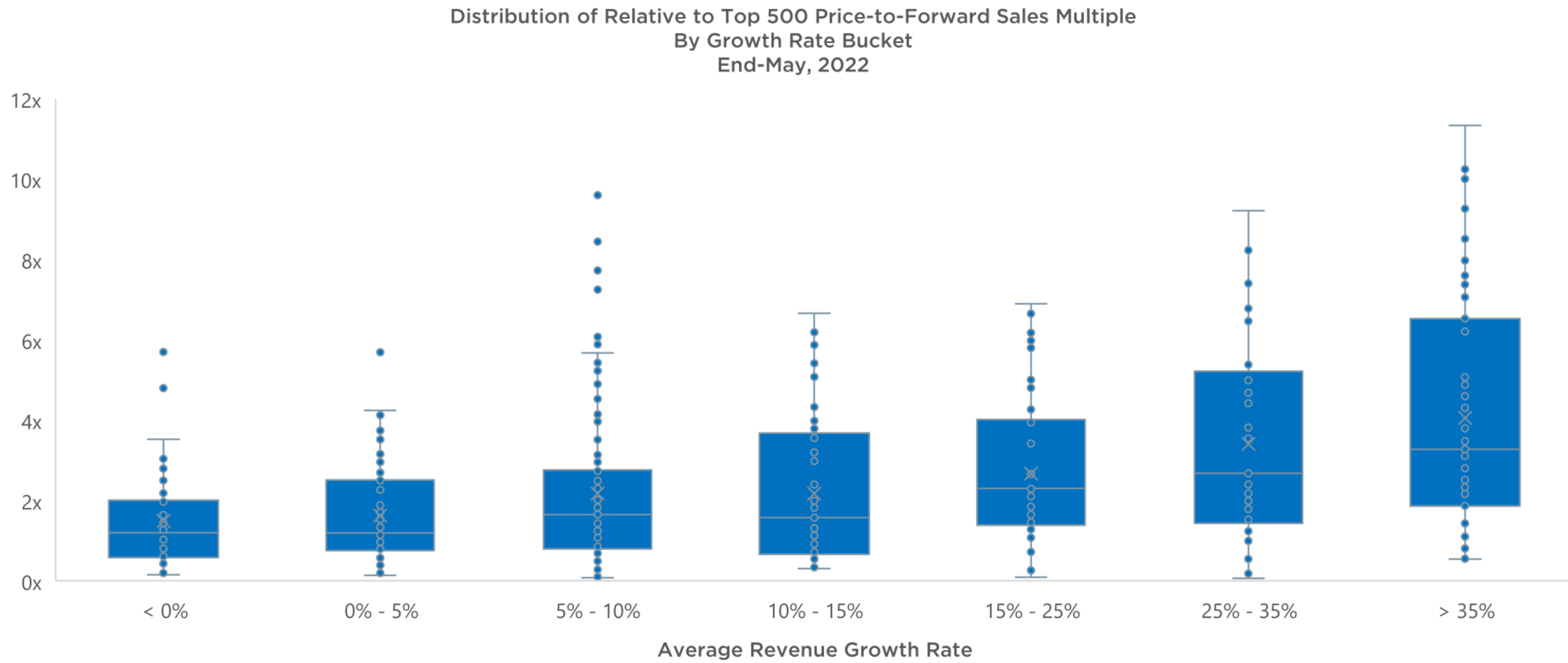
FASTER GROWTH MEANS DISPROPORTIONATELY HIGHER MULTIPLES

We analyzed the growth rates and relative to SP500 price-to-sales multiples for US stocks (excluding small / micro caps and value stocks). Growth / neither stocks with revenue growth below 0% have a relative price-to-sales multiple close to the market level, but as annual revenue growth exceeds 10%, the relative multiple begins to incrementally expand. Companies that grow 25-35% annual trade at nearly 4x the market multiple on sales on average, vs. 2x on average at 5-10% annual growth. **Higher growth means disproportionately higher multiples!**



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LONG / SHORT GROWTH STOCK IDEAS

Current ideas where revenue growth is forecasted to accelerate but relative multiples are low (left) and where growth is forecasted to slow but multiples are high (right).

Buy Cheap Relative to Bucket or Moving to Higher Revenue Bucket, Short Expensive Relative to Bucket or Moving to Lower Revenue Bucket
End-May, 2022

Long				Short			
Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)	Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
AMZN	Amazon.com, Inc.	Retailing	61.15	ISRG	Intuitive Surgical, Inc.	Health Care Equip. & Serv.	81.71
CNC	Centene Corporation	Health Care Equip. & Serv.	47.63	BDX	Becton, Dickinson and Company	Health Care Equip. & Serv.	72.92
SYY	Sysco Corporation	Food & Staples Retailing	42.89	PSA	Public Storage	Real Estate	58.04
LUV	Southwest Airlines Co.	Transportation	27.19	GPN	Global Payments Inc.	Software & Services	36.89
DAL	Delta Air Lines, Inc.	Transportation	26.73	BF.B	Brown-Forman Corporation	Food, Beverage & Tobacco	31.16
DHI	D.R. Horton, Inc.	Consumer Durables & App.	26.46	DDOG	Datadog, Inc.	Software & Services	30.05
LEN	Lennar Corporation	Consumer Durables & App.	23.23	EQR	Equity Residential	Real Estate	28.89
MOS	The Mosaic Company	Materials	22.68	ANSS	ANSYS, Inc.	Software & Services	22.65
CF	CF Industries Holdings, Inc.	Materials	20.60	ALGN	Align Technology, Inc.	Health Care Equip. & Serv.	21.88
KMX	CarMax, Inc.	Retailing	15.90	TSCO	Tractor Supply Company	Retailing	20.96
CCL	Carnival Corporation & plc	Consumer Services	15.57	MAA	Mid-America Apartment Communities	Real Estate	20.89
UAL	United Airlines Holdings, Inc.	Transportation	15.56	DRE	Duke Realty Corporation	Real Estate	20.31
MGM	MGM Resorts International	Consumer Services	14.90	CNHI	CNH Industrial N.V.	Capital Goods	20.22
HST	Host Hotels & Resorts, Inc.	Real Estate	14.29	IR	Ingersoll Rand Inc.	Capital Goods	19.14
CZR	Caesars Entertainment, Inc.	Consumer Services	10.75	HOLX	Hologic, Inc.	Health Care Equip. & Serv.	18.77
CHWY	Chewy, Inc.	Retailing	10.43	BBY	Best Buy Co., Inc.	Retailing	18.46
SNX	TD SYNNEX Corporation	Tech. Hardware & Equip.	9.98				
Z	Zillow Group, Inc.	Real Estate	9.83				

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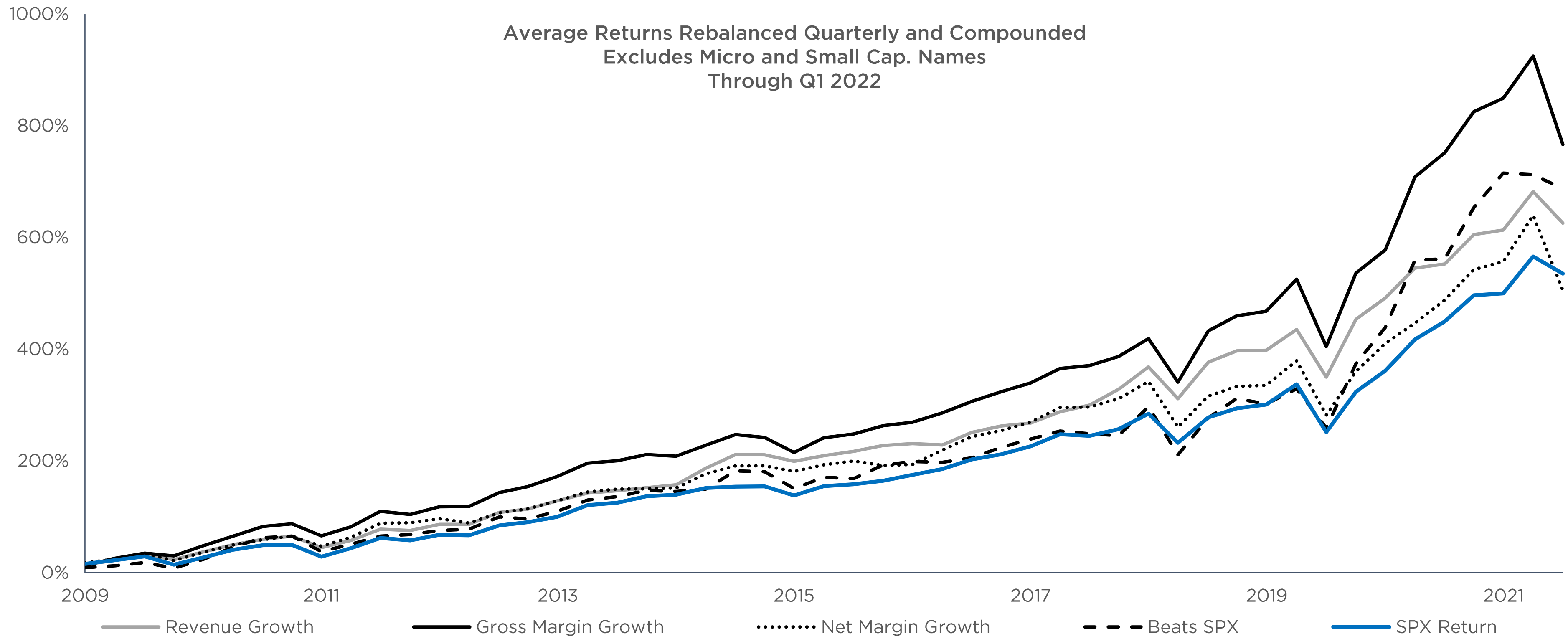
BUY CONSISTENT GROSS MARGIN EXPANDERS

Of the four signals we studied (prior relative stock performance, revenue growth, gross margin expansion, and net margin expansion) buying stocks in the top 10% of consistent previous gross margin expansion resulted in the best subsequent stock performance.   While all four approaches beat the SP500, the consistency and total performance of the gross margin approach far bested the others. Net margin growth was clearly the weakest. Prior stock performance was strong, but much of this was generated since COVID.



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GROSS MARGIN GROWTH CAN LAST FOR YEARS

Of the ~400 companies with at least two consecutive quarters of gross margin growth this last quarter, 35 companies (top decile) had quarterly year-over-year gross margin expansion for at least 13 straight quarters (left chart). This universe of stocks has typically resulted in strong, above market performance. The stocks among this list with forecasted further gross margin expansion include AVGO, AMD and MO (right chart) among others.

Gross Margin Growth Compounders
Min. Number of Consecutive Quarters of Growth
Through Q1 2022

Gross Margin Growth Compounders
And Forecasted Gross Margin Growth
Q1 2022

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
AVGO	Broadcom Inc.	Semis & Semi. Equip.	244.47
AMD	Advanced Micro Devices, Inc.	Semis & Semi. Equip.	165.06
IDXX	IDEXX Laboratories, Inc.	Health Care Equip. & Serv.	32.9
KEYS	Keysight Technologies, Inc.	Tech. Hardware & Equip.	26.5
HZNP	Horizon Therapeutics Public Limited Company	Pharma, Biotech. & Life Sci.	20.62
GPC	Genuine Parts Company	Retailing	19.36
QRVO	Qorvo, Inc.	Semis & Semi. Equip.	11.85

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WHAT IS A MELTING ICE CUBE?

Accruals and price momentum are best: Our analysis clearly shows that these two variables identify relative underperformers far better than the others. This works confirms some work we had done years ago on short-selling, and while the result is not surprising to us, we found many in the past who were philosophically resistant to the conclusion. Analysts should focus on disconnects between earnings and free cash flow and should not try to short stocks at highs.

Other metrics do not incrementally help: No other major fundamental attribute comes close to achieving the level of success at predicting subsequent underperformers as either accruals or momentum. **We are not saying that resource allocators should not hire shorting experts, we are only saying that if you focus on bigger companies that repeatedly exhibit negative attributes, i.e., steady melting ice-cubes, then accruals and momentum are far better signals than the common fundamental ones most bottom-up stock pickers focus on like share loss and margin contractoin.** Moreover, if you do not have a dedicated short seller, but industry experts, they should start with stocks with high relative accruals that have lagged and size those stocks larger than those with other negative attributes. **Downward analyst earnings revisions, often an investor focus, is not fruitful, as these stocks go on to outperform the market on average over the next quarter.**

Conclusion and short ideas: Stocks repeatedly in the top quintile of the market on accruals are an inferior asset class. These "high accrual" stocks that have also underperformed their peer group (market cap and industry medians) form a cohort that substantially lags the S&P500 over time. Our list of short ideas (i.e., the melting ice cubes) are shown on page 40.

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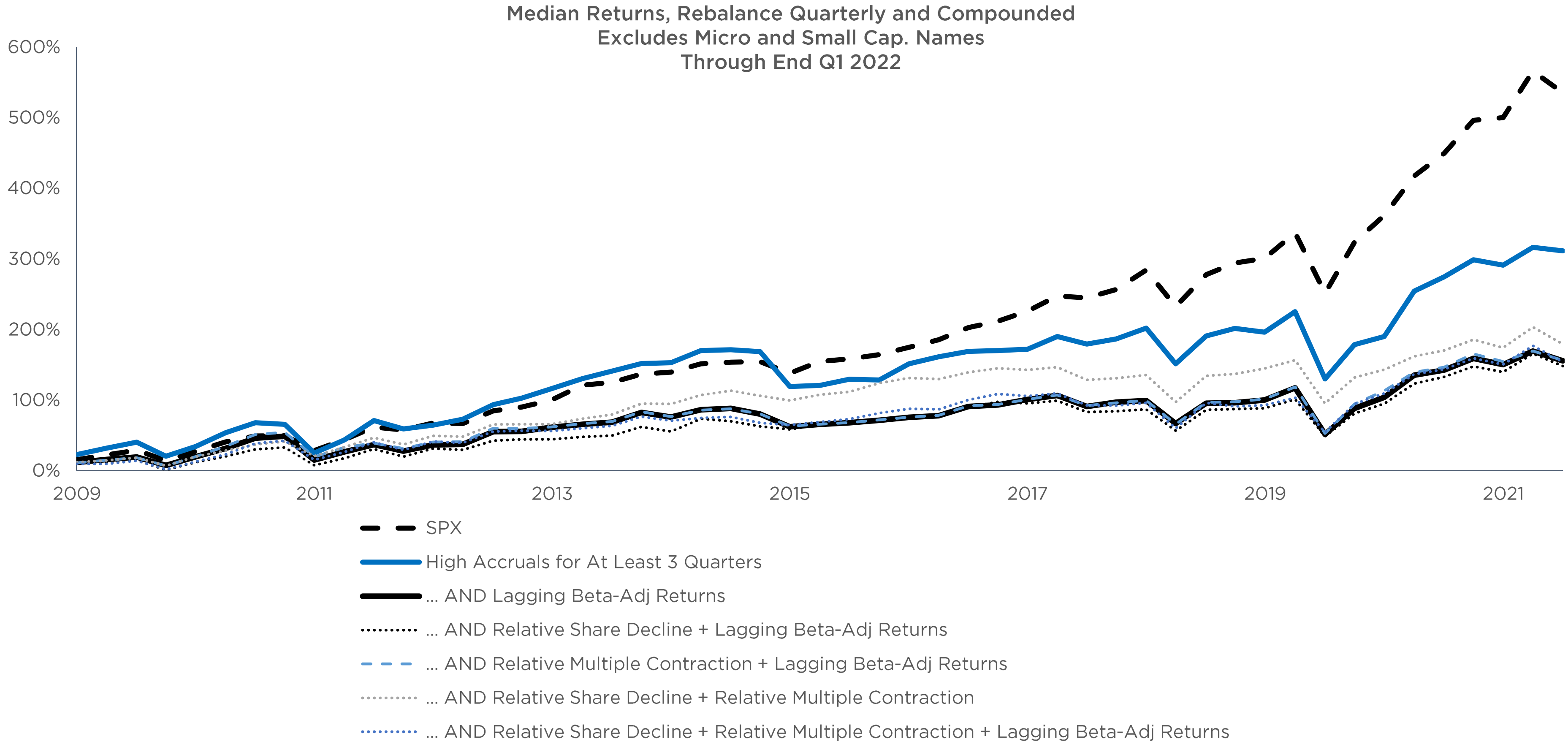
HIGH ACCRUALS WITH BAD MOMENTUM ARE GOOD SHORTS

The combination of high accruals and relative prior underperformance is compelling. By selecting only those names with high accruals for the previous three quarters that also have returns lagging their industry group and similarly-sized peers, performance can be cut nearly in half (solid blue line to solid black line compared to the SP500 returns that are the dotted black line). Further sub-setting, using changes in valuation or share, for example, have proven detrimental (in the case of forecasted share decline and prior relative contraction) or not accretive.



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TODAY'S MELTING ICE CUBES OR CANDIDATE SHORT IDEAS

Below are companies with high accruals for the past three quarters that have had relatively poor stock performance in the last quarter.

Select Names with High Accruals
At Least Three Consecutive Quarters & Lagged Peers This Past Quarter
Through End-May, 2022

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
WST	West Pharmaceutical Services, Inc.	Pharmaceuticals, Biotechnology & Life Sciences	22.99
CTLT	Catalent, Inc.	Pharmaceuticals, Biotechnology & Life Sciences	18.47
LAD	Lithia Motors, Inc.	Retailing	8.81
ZIM	ZIM Integrated Shipping Services Ltd.	Transportation	7.63
ORI	Old Republic International Corporation	Insurance	7.23
AXON	Axon Enterprise, Inc.	Capital Goods	7.2
VVV	Valvoline Inc.	Materials	5.96
SAM	The Boston Beer Company, Inc.	Food, Beverage & Tobacco	4.33
WOOF	Petco Health and Wellness Company, Inc.	Retailing	4.23
FTI	TechnipFMC plc	Energy	3.76
SPB	Spectrum Brands Holdings, Inc.	Household & Personal Products	3.58
LCII	LCI Industries	Automobiles & Components	3.04
MDC	M.D.C. Holdings, Inc.	Consumer Durables & Apparel	2.72
ABCL	AbCellera Biologics Inc.	Pharmaceuticals, Biotechnology & Life Sciences	2.17
FTAI	Fortress Transportation and Infrastructure Investors LLC	Capital Goods	1.99

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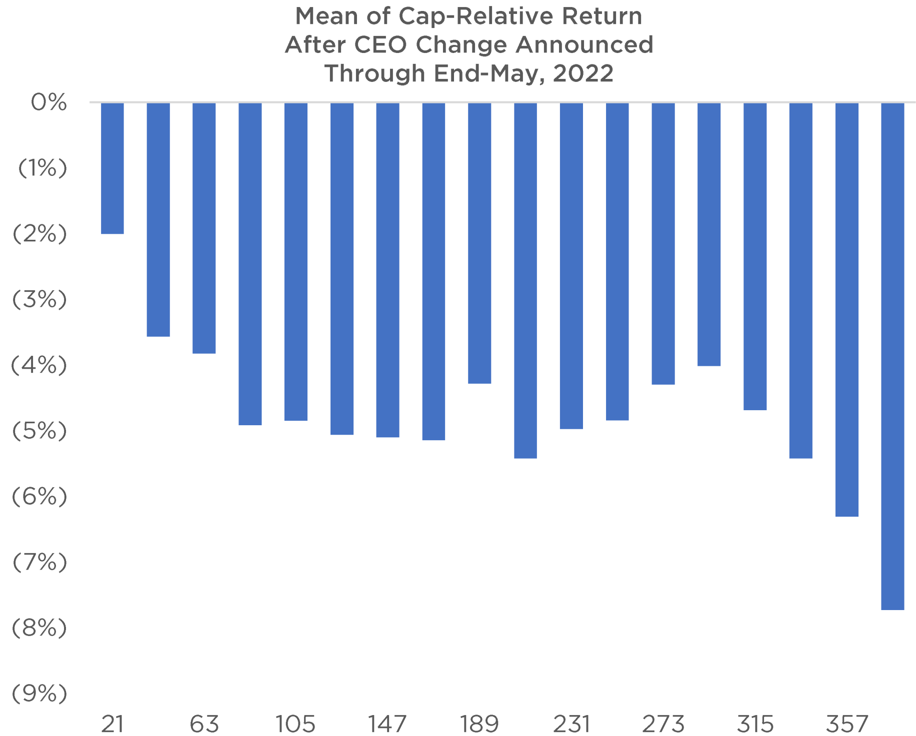
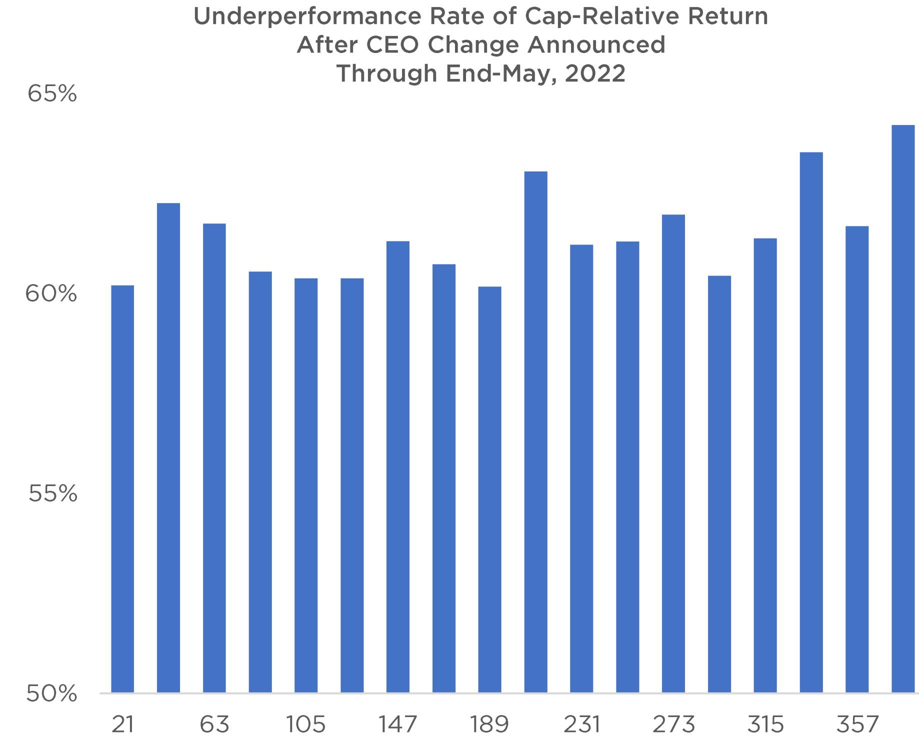
EXPENSIVE GROWTH STOCKS LAG WHEN THE CEO CHANGES

We analyzed the performance of the expensive growth universe that have new CEOs. Expensive growth stocks underperform the most dramatically of any sub-group and should on average be sold / shorted following the announcement for three-to for months (left chart). This strategy has a hit rate well over 60% for the first year (right chart).





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EXPENSIVE GROWTH STOCKS WITH NEW CEOS IN THE LAST YEAR

Below we show expensive growth stocks with CEO changes. Since the announcement, absolute performance, and performance of each stock relative to the average stock in their market cap cohort, shows this underperformance trend has continued this year.

Performance After CEO Change Announced
Expensive Growth Stocks
Through End-May, 2022

Ticker	Company Name	Industry	Date Announced	Return	Cap-Relative Return	Market Cap ($ US. Bil)
CRM	Salesforce, Inc.	Software	12/1/2021	(36.3%)	(27.2%)	159.27
MAR	Marriott International, Inc.	Hotels, Restaurants & Leisure	2/23/2021	14.9%	11.9%	56.16
TWTR	Twitter, Inc.	Interactive Media & Services	11/30/2021	(9.9%)	(1.2%)	30.21
SPLK	Splunk Inc.	Software	3/3/2022	(15.8%)	(8.8%)	16.51
HUBS	HubSpot, Inc.	Software	3/1/2021	(35.9%)	(33.6%)	16.13
RCL	Royal Caribbean Cruises Ltd.	Hotels, Restaurants & Leisure	11/9/2021	(36.4%)	(21.2%)	14.81
PODD	Insulet Corporation	Health Care Equipment & Supplies	5/6/2022	3.8%	2.9%	14.80
TW	Tradeweb Markets Inc.	Capital Markets	2/16/2022	(19.3%)	(9.8%)	13.83
AAL	American Airlines Group Inc.	Airlines	12/7/2021	(0.1%)	11.7%	11.61
DT	Dynatrace, Inc.	Software	11/15/2021	(46.7%)	(31.5%)	10.81
PCTY	Paylocity Holding Corporation	Software	3/15/2022	(7.8%)	(4.4%)	9.64
PATH	UiPath Inc.	Software	4/27/2022	(7.0%)	(5.3%)	9.30
CDAY	Ceridian HCM Holding Inc.	Software	2/10/2022	(26.7%)	(17.4%)	8.59
WYNN	Wynn Resorts, Limited	Hotels, Restaurants & Leisure	11/10/2021	(28.2%)	(13.8%)	7.61
ESTC	Elastic N.V.	Software	1/13/2022	(37.0%)	(24.9%)	5.76
PTON	Peloton Interactive, Inc.	Leisure Products	2/8/2022	(62.5%)	(53.8%)	4.71
VAL	Valaris Limited	Energy Equipment & Services	12/9/2021	94.0%	108.5%	4.46
IRTC	iRhythm Technologies, Inc.	Health Care Equipment & Supplies	9/13/2021	116.8%	130.4%	4.20
GH	Guardant Health, Inc.	Health Care Providers & Services	8/6/2021	(64.1%)	(54.7%)	4.18
SEAS	SeaWorld Entertainment, Inc.	Hotels, Restaurants & Leisure	5/6/2021	2.1%	15.3%	3.94

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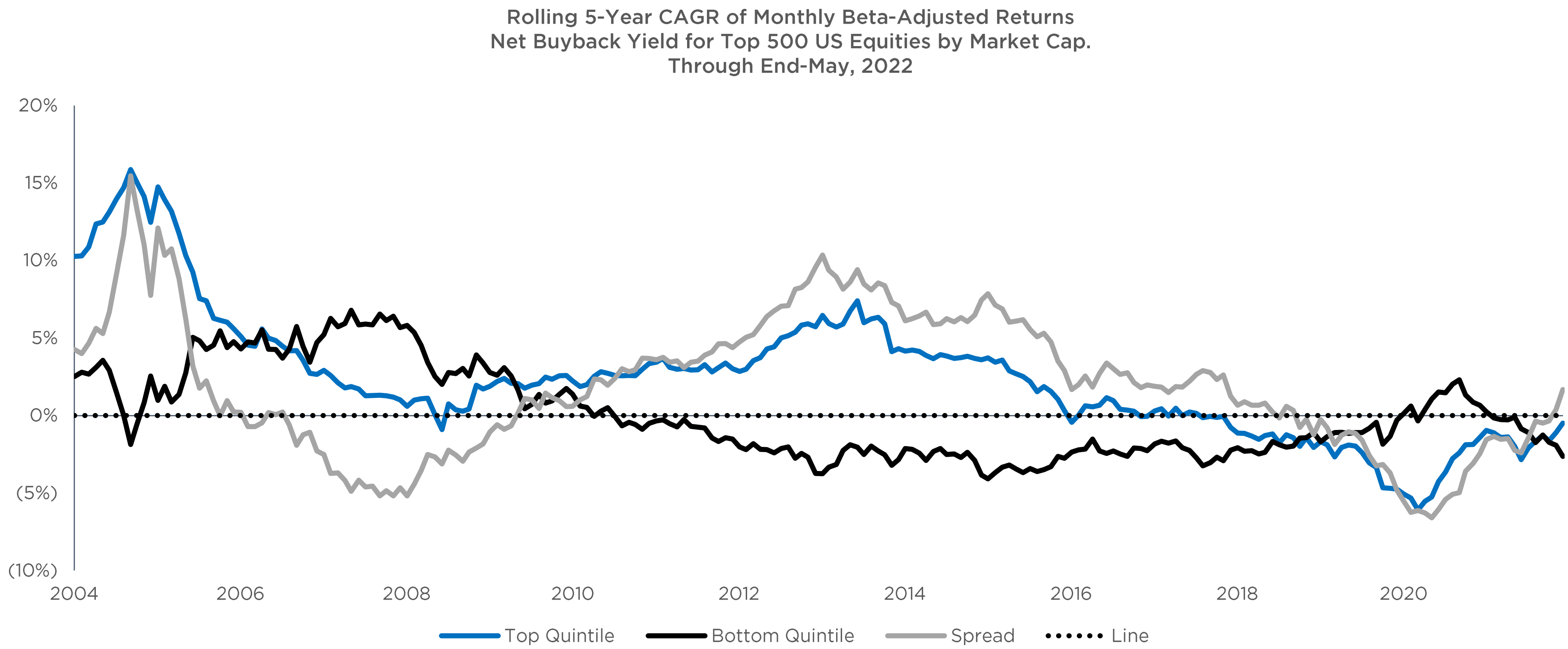
DO STOCK BUYBACKS DRIVE SHAREHOLDER VALUE? ANSWER: NO

We evaluated the relative performance of SP500 companies in the top quintile of buyback yield (blue line) and bottom quintile of buyback yield (net diluters, black line) over the past 20 years. Buybacks had been an effective use of capital prior the Financial Crisis. However, since then, the performance of the top (Q1) and bottom (Q5) quintile "spread" is roughly zero, with Q5 generally performing better than the Q1 over the past decade. The strong performance of Q5 is in part because growth companies issue stock options and require additional stock offerings to grow. This happened in a successful growth style regime fueling the bottom quintile's strength. However, this does not explain the relative weakness of Q1.



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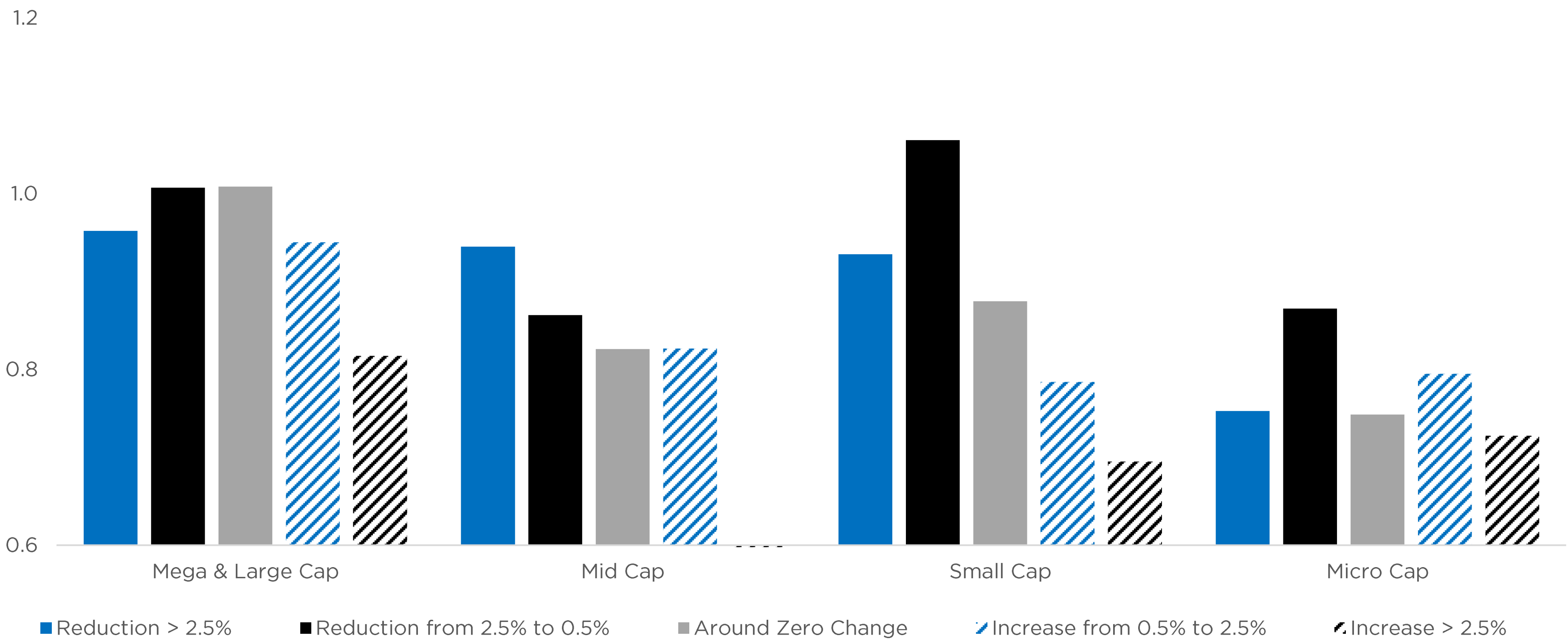
LARGE CAP STOCKS DOING BUYBACKS HAVE WASTED THE MONEY

Management teams of mega / large cap companies should be questioning whether large buybacks are prudent. On average, they were not rewarded, as big share reductions over a 9-month period resulted in similar subsequent performance to those companies doing substantial dilution over the same period (left set of bars). Diluters in mid-cap and micro-cap seem to lag companies doing buybacks, but that relationship did not hold for small-caps.

Information Ratio by Size of 9-Month Percent Change in Shares Outstanding
By Quality Category
From June 2009 to End-May, 2022



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MANAGEMENT TEAMS THAT SHOULD PIVOT TO DIVIDENDS?

Below are stocks that have done large buybacks and have not performed well.

Short Mega or Large Cap High Quality Value Names That Bought Back 1% or More Shares From 2019 to End-May, 2022

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
COP	ConocoPhillips	Energy	142.59
MDT	Medtronic plc	Health Care Equipment & Services	133.27
LOW	Lowe's Companies, Inc.	Retailing	124.82
CTVA	Corteva, Inc.	Materials	45.32
TRV	The Travelers Companies, Inc.	Insurance	42.96
SBAC	SBA Communications Corporation	Real Estate	36.3
YUM	Yum! Brands, Inc.	Consumer Services	34.64
EBAY	eBay Inc.	Retailing	27.25

Short Names that Bought Back 10% or More of Shares & Underperformed From 2019 to End-May, 2022

DD	DuPont de Nemours, Inc.	Materials	34.50
BIIB	Biogen Inc.	Pharmaceuticals, Biotechnology & Life Sciences	29.29
DXC	DXC Technology Company	Software & Services	8.12
LII	Lennox International Inc.	Capital Goods	7.50
KSS	Kohl's Corporation	Retailing	5.18
ATUS	Altice USA, Inc.	Media & Entertainment	5.17
PVH	PVH Corp.	Consumer Durables & Apparel	4.79
SLG	SL Green Realty Corp.	Real Estate	3.96
ALSN	Allison Transmission Holdings, Inc.	Capital Goods	3.88
NEU	NewMarket Corporation	Materials	3.38
FL	Foot Locker, Inc.	Retailing	3.17
LOPE	Grand Canyon Education, Inc.	Consumer Services	2.84
EAF	GrafTech International Ltd.	Capital Goods	2.26
HLF	Herbalife Nutrition Ltd.	Household & Personal Products	2.14
YELP	Yelp Inc.	Media & Entertainment	2.08
DK	Delek US Holdings, Inc.	Energy	2.06

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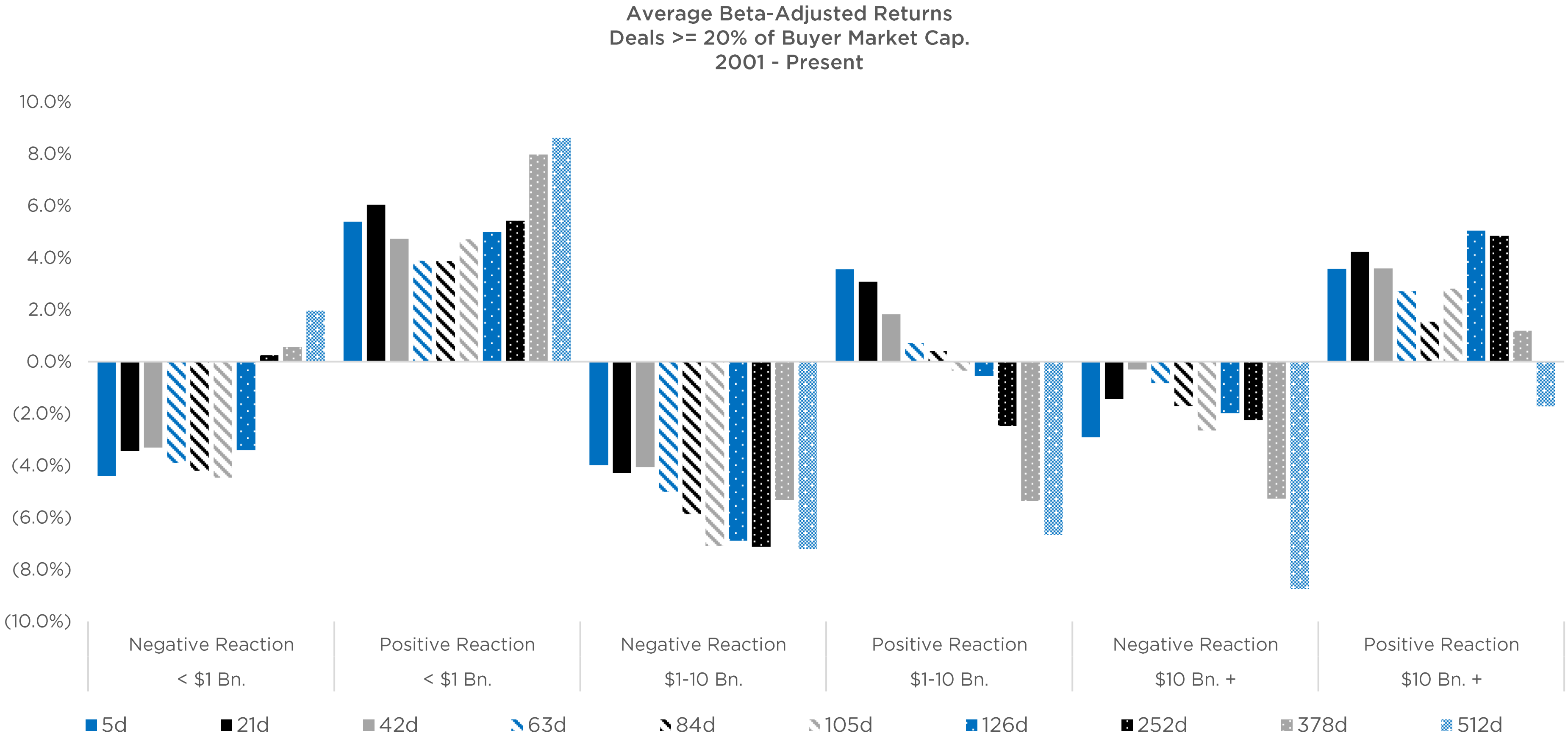
FIRST IMPRESSIONS MATTER

We evaluated the subsequent performance over multiple horizons (one week, and each months 1-6, as well as 12, 18, and 24 months) to see if the initial market reaction to a deal announcement matters. It does. The middle shows deals for companies $1 to $10 billion market capitalization. Here we can see particularly weak subsequent performance for stocks where the initial reaction is negative. Moreover, unlike for other sized companies doing deals, even positive initial reactions fade after 5 months for the acquirers. On the right side of the chart below we show deals for companies bigger than $10 billion. The initial reaction carries the day for nearly 18 months if it is positive.



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RECENT DEAL STOCKS WITH INITIAL / SUSTAINED POSITIVE REACTION

Select Recent Deals with Initial Positive Reaction
Buyer Market Cap. Between $0.5-10 bn. (at time of announcement)
End-May 2022

Ticker	Company	Industry Group	Target Company	Announcement Date	Beta-Adjusted Return	Market Cap. (US$ Bil.)
AMD	Advanced Micro Devices, Inc.	Semis & Semi Equipment	Xilinx, Inc.	10/27/2020	4.3%	165.06
DVN	Devon Energy Corporation	Energy	WPX Energy, Inc.	9/28/2020	705.2%	49.47
APO	Apollo Global Management, Inc.	Diversified Financials	The Michaels Companies, Inc.	3/3/2021	8.6%	33.11
ABC	AmerisourceBergen Corporation	Health Care Equip. & Serv.	Alliance Healthcare	1/6/2021	36.5%	32.42
MTB	M&T Bank Corporation	Banks	People's United Financial, Inc.	2/22/2021	12.4%	32.29
AEM	Agnico Eagle Mines Limited	Materials	Kirkland Lake Gold Ltd.	9/28/2021	12.9%	24.08
EQT	EQT Corporation	Energy	Alta Resources, LLC	5/6/2021	161.6%	17.63
KIM	Kimco Realty Corporation	Real Estate	Weingarten Realty Investors	4/15/2021	21.7%	14.62
ALLY	Ally Financial Inc.	Diversified Financials	CardWorks, Inc.	2/18/2020	18.9%	14.23
SWN	Southwestern Energy Company	Energy	Natural Resources, LLC	6/2/2021	63.8%	10.18
HII	Huntington Ingalls Industries, Inc.	Capital Goods	Alion Science and Technology Corp.	7/6/2021	8.3%	8.43
COTY	Coty Inc.	Household & Personal Products	Professional Beauty and Retail Hair Businesses	5/11/2020	2.8%	5.95
HGV	Hilton Grand Vacations Inc.	Consumer Services	Diamond Resorts International, Inc.	3/10/2021	5.8%	5.5
FIBK	First Interstate BancSystem, Inc.	Banks	Great Western Bancorp, Inc.	9/16/2021	8.2%	4.17
GPI	Group 1 Automotive, Inc.	Retailing	Prime Automotive Group, Inc.	9/13/2021	16.7%	2.89
MGPI	MGP Ingredients, Inc.	Food, Beverage & Tobacco	Luxco, Inc.	1/25/2021	70.1%	2.13
NPO	EnPro Industries, Inc.	Capital Goods	NxEdge Inc.	11/5/2021	7.6%	1.99
ARCB	ArcBest Corporation	Transportation	MoLo Solutions, LLC	9/29/2021	3.1%	1.85
CEIX	CONSOL Energy Inc.	Energy	CONSOL Coal Resources LP	10/23/2020	979.6%	1.8
PFS	Provident Financial Services, Inc.	Banks	SB One Bancorp	3/12/2020	18.3%	1.72
CODI	Compass Diversified	Diversified Financials	Marucci Sports, LLC	3/9/2020	8.7%	1.59
LBAI	Lakeland Bancorp, Inc.	Banks	1st Constitution Bancorp	7/12/2021	0.7%	1.01

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RECENT DEAL STOCKS WITH INITIAL / SUSTAINED NEGATIVE REACTION

Select Recent Deals with Initial Negative Reaction
Buyer Market Cap. Between $0.5-10 bn. (at time of announcement)
End-May 2022

Ticker	Company	Industry Group	Target Company	Announcement Date	Beta-Adjusted Return	Market Cap. (US$ Bil.)
TDY	Teledyne Technologies Incorporated	Capital Goods	FLIR Systems, Inc.	1/4/2021	(2.2%)	18.98
PKI	PerkinElmer, Inc.	Pharma, Biotech & Life Sci.	BioLegend, Inc.	7/26/2021	(7.5%)	18.88
SNX	TD SYNNEX Corporation	Tech. Hardware & Equip.	Tech Data Corporation	3/22/2021	(11.1%)	9.98
NFE	New Fortress Energy Inc.	Energy	Hygo Energy Transition Ltd	1/13/2021	(27.0%)	9.67
PFGC	Performance Food Group Company	Food & Staples Retailing	Core-Mark Holding Company, Inc.	5/18/2021	(12.3%)	6.72
QDEL	QuidelOrtho Corporation	Health Care Equipment & Services	Ortho Clinical Diagnostics Holdings plc	12/23/2021	(18.8%)	6.34
SSB	SouthState Corporation	Banks	CenterState Bank Corporation	1/27/2020	(24.0%)	6.09
RUN	Sunrun Inc.	Capital Goods	Vivint Solar, Inc.	7/6/2020	(11.3%)	5.49
ATUS	Altice USA, Inc.	Media & Entertainment	Cogeco Communications Inc.	9/2/2020	(78.7%)	5.17
SAIC	Science Applications International Corporation	Software & Services	Unisys Federal	2/6/2020	(34.3%)	4.83
NCR	NCR Corporation	Tech. Hardware & Equip.	Cardtronics plc	1/7/2021	(18.9%)	4.74
ONB	Old National Bancorp	Banks	First Midwest Bancorp, Inc.	6/1/2021	(12.0%)	4.66
GT	The Goodyear Tire & Rubber Company	Autos & Components	Cooper Tire & Rubber Company	2/22/2021	(31.7%)	3.65
DBRG	DigitalBridge Group, Inc.	Real Estate	DigitalBridge Investment Management, LLC	4/18/2022	(8.8%)	3.6
ETRN	Equitrans Midstream Corporation	Energy	EQM Midstream Partners, LP	2/27/2020	(18.5%)	3.41
WSFS	WSFS Financial Corporation	Banks	Bryn Mawr Bank Corporation	3/10/2021	(27.7%)	2.77
AHCO	AdaptHealth Corp.	Health Care Equipment & Services	AeroCare Holdings, Inc.	12/1/2020	(64.6%)	2.42
MSGE	Madison Square Garden Entertainment Corp.	Media & Entertainment	MSG Networks Inc.	3/26/2021	(25.7%)	2.32
FTAI	Fortress Transportation and Infrastructure Investors LLC	Capital Goods	Transtar LLC.	6/8/2021	(29.4%)	1.99
FBK	FB Financial Corporation	Banks	Franklin Financial Network, Inc.	1/21/2020	(16.0%)	1.98
VCTR	Victory Capital Holdings, Inc.	Diversified Financials	WestEnd Advisors, LLC	11/4/2021	(13.6%)	1.94

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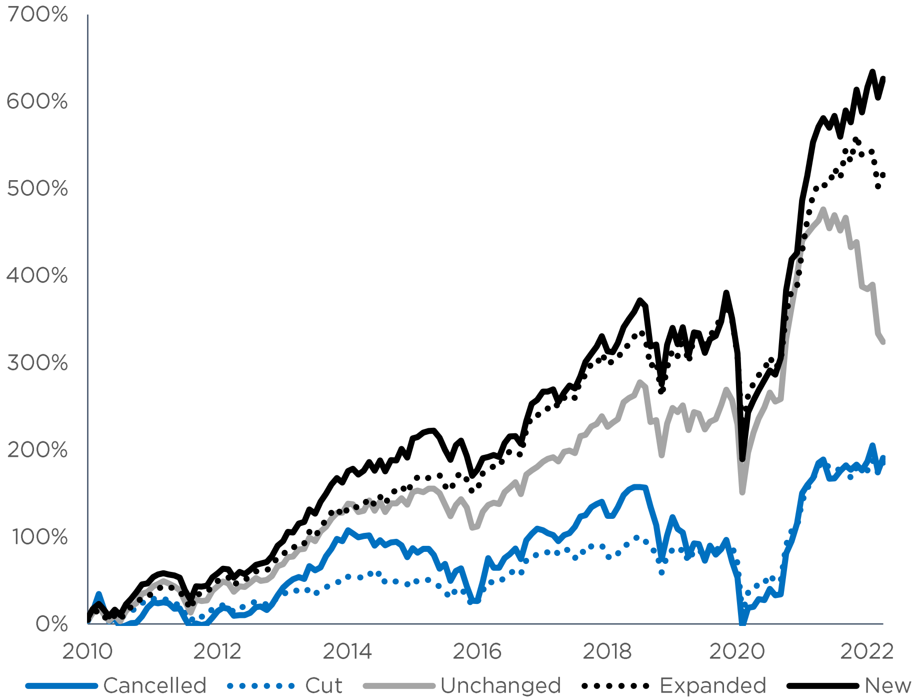
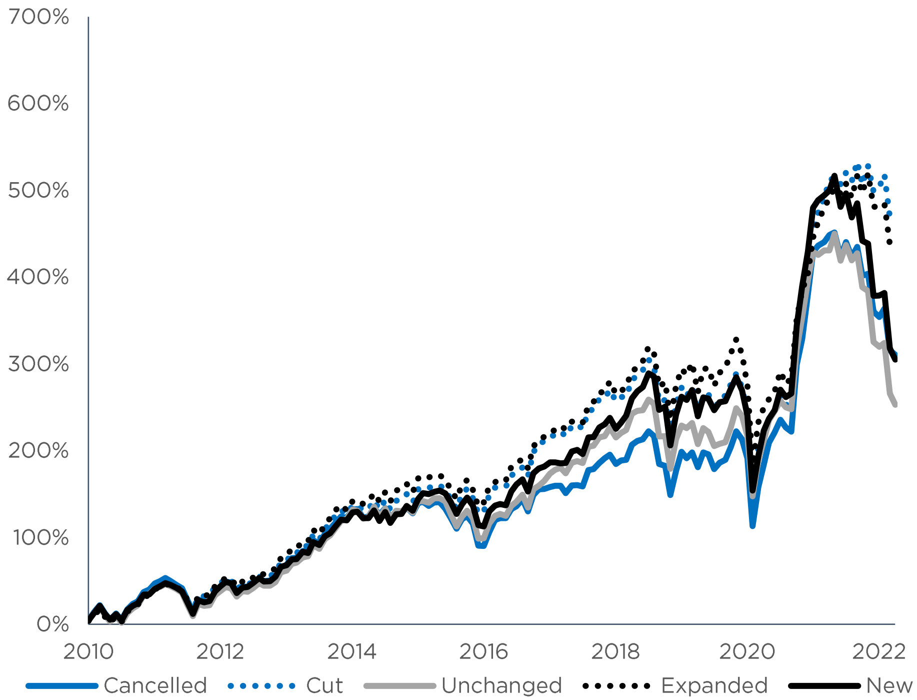
YIELD AND BUYBACK RETURNS – BUYBACKS DON'T SEPARATE

The market rewards initiating or expanding a dividend more than those cutting or cancelling (left). However, as we observed in our prior work on buybacks (right) the market does not materially reward or penalize companies for their buyback behavior in the aggregate. Companies that reduce their buyback or even stop it do not have cumulative performance that is substantially different than those that expand their buyback. Hence, while buybacks might be a great strategy for a company with truly cheap shares or an inflecting business, in aggregate the market seems to differentiate between companies much more on dividend than on buybacks.

Compounded Average Return
By Dividend Change Category
2010 – End-May, 2022



Compounded Average Return
By Buyback Change Category
2010 – End-May, 2022



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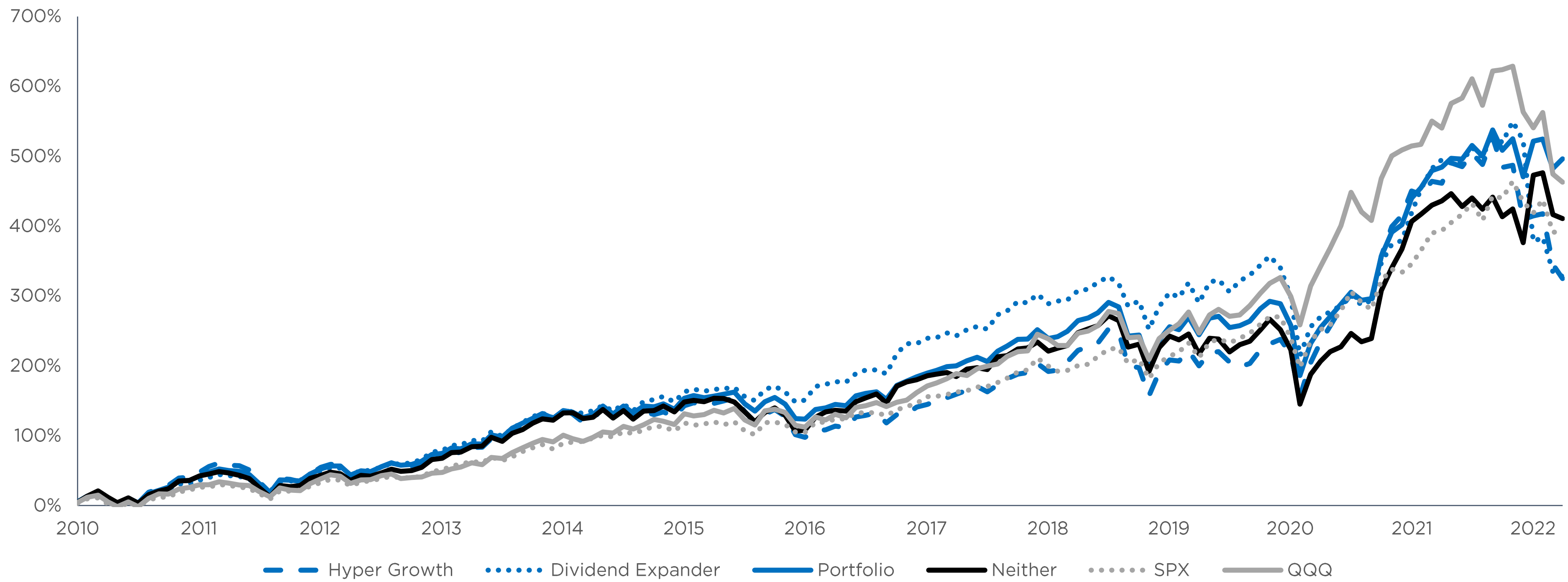
IS A COMBO OF GROWTH STOCKS AND DIVIDEND EXPANDERS GOOD?

Given that growth stocks have worked so well since the Financial Crisis as rates rose, we wondered how a basket of dividend expanders performed. It is interesting to note (blue dotted line) that dividend expanders have outperformed the hyper growth basket since the beginning of 2010, with a portfolio (50%-50% hyper growth / dividend growers) beating the SP500 but lagging the Nasdaq over that same time frame. Stocks that were not either hyper growth or a dividend expander, as a basket, lagged the most.

Compounded Average Returns
2010 – End-May, 2022



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YOU MUST EXPAND YOUR DIVIDEND WHILE THE FED'S HIKING

It is challenging to provide the perfect historical analog to evaluate. Nonetheless, many investors ask us what happened in and around the previous set of lift-off and hikes, so we evaluated the various strategies one-month before and 3-months after each Fed hike since the Financial crisis. Growing the dividend through the hiking cycle seems by far the best strategy. Having your yield above your peer-group (level) did not generally help. If you have no dividend now, initiating one is not a bad idea. Cutting, or even leaving the dividend unchanged was generally penalized. As history dictated, dividend yielding stocks outperformed during Q1.

Beta-Adjusted Returns
Select Signals

Signal	11/13/2015 to 3/17/2016	11/15/2016 to 3/20/2017	2/10/2017 to 6/13/2017	5/12/2017 to 9/12/2017	11/13/2017 to 3/16/2018	2/16/2018 to 6/19/2018	5/11/2018 to 9/11/2018	8/24/2018 to 12/26/2018	11/27/2018 to 4/1/2019	Mean	Median
Group-Relative Indicated Annual Dividend Yield	2.1%	(0.7%)	(2.1%)	(3.5%)	(1.2%)	1.9%	3.2%	0.5%	(1.1%)	(0.1%)	(0.7%)
Dividend Cancelled	(3.6%)	(5.3%)	(9.1%)	(1.1%)	(2.8%)	2.9%	(5.9%)	(24.7%)	(11.0%)	(2.3%)	(1.9%)
Dividend Cut	0.4%	(3.5%)	(6.5%)	(6.4%)	(7.7%)	4.4%	0.0%	(16.4%)	(7.0%)	(6.3%)	(4.9%)
Dividend Expanded	0.4%	0.2%	(0.9%)	(0.8%)	2.0%	5.2%	(0.4%)	(9.0%)	(1.0%)	4.0%	4.0%
Dividend Initiated	(3.1%)	3.6%	(8.1%)	(0.5%)	0.5%	6.7%	3.5%	(11.0%)	1.3%	1.4%	(0.1%)
Dividend Unchanged	(4.4%)	(4.4%)	(4.3%)	(1.4%)	1.7%	9.9%	1.3%	(12.0%)	(0.5%)	(3.6%)	(4.0%)
Hyper Growth & Dividend Expander Portfolio	(6.3%)	(2.4%)	(0.9%)	(2.8%)	1.3%	8.4%	0.5%	(11.5%)	(1.0%)	(0.5%)	(0.4%)

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QUANTITATIVELY-DERIVED HIGH DIVIDEND YIELD STOCK IDEAS

Buy ideas below are in the top 20% of our high yield or high yield junk models and are dividend expanders. Short ideas are in the bottom quintile of the models and are not growing their dividends (or cut / cancelled).

Buy Dividend Expanders in Top 20% of High Yield Models
Short non-Dividend Expanders in Bottom 20% of High Yield Models or Non-Growth Cutters/Cancellers in Bottom 20% of Overall Model
End-May, 2022

Longs

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
AMGN	Amgen Inc.	Pharma, Biotech & Life Sci.	137.15
F	Ford Motor Company	Automobiles & Components	54.99
DVN	Devon Energy Corporation	Energy	49.47
PCAR	PACCAR Inc	Capital Goods	30.19
ALLY	Ally Financial Inc.	Diversified Financials	14.23
IVZ	Invesco Ltd.	Diversified Financials	8.80
TPR	Tapestry, Inc.	Consumer Durables & Apparel	8.69
OMF	OneMain Holdings, Inc.	Diversified Financials	5.52
IGT	International Game Technology PLC	Consumer Services	4.35
TRTN	Triton International Limited	Capital Goods	4.09
WEN	The Wendy's Company	Consumer Services	3.99
SBLK	Star Bulk Carriers Corp.	Transportation	3.36
CRI	Carter's, Inc.	Consumer Durables & Apparel	3.10
BCC	Boise Cascade Company	Capital Goods	3.05
ARCH	Arch Resources, Inc.	Energy	2.77
KTB	Kontoor Brands, Inc.	Consumer Durables & Apparel	2.24
VRTS	Virtus Investment Partners, Inc.	Diversified Financials	1.44
MRTN	Marten Transport, Ltd.	Transportation	1.44
EGLE	Eagle Bulk Shipping Inc.	Transportation	1.00
GSL	Global Ship Lease, Inc.	Transportation	0.80
CSWC	Capital Southwest Corporation	Diversified Financials	0.56
PANL	Pangaea Logistics Solutions, Ltd.	Transportation	0.31

Shorts

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
PEG	Public Service Enterprise Group Inc.	Utilities	34.22
EVRG	Evergy, Inc.	Utilities	16.05
CPB	Campbell Soup Company	Food, Beverage & Tobacco	14.45
SJM	The J. M. Smucker Company	Food, Beverage & Tobacco	13.60
OGE	OGE Energy Corp.	Utilities	8.27
RL	Ralph Lauren Corporation	Consumer Durables & Apparel	7.08
SON	Sonoco Products Company	Materials	5.70
JHG	Janus Henderson Group plc	Diversified Financials	4.68
FTI	TechnipFMC plc	Energy	3.76
PDCO	Patterson Companies, Inc.	Health Care Equip. & Services	3.08
XRX	Xerox Holdings Corporation	Tech. Hardware & Equip.	2.91
WRE	Washington Real Estate Investment Trust	Real Estate	2.12
TRN	Trinity Industries, Inc.	Capital Goods	2.07
NWN	Northwest Natural Holding Company	Utilities	1.86
GPRE	Green Plains Inc.	Energy	1.75
STRA	Strategic Education, Inc.	Consumer Services	1.63
KALU	Kaiser Aluminum Corporation	Materials	1.62

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CAPITAL SPENDING AND R&D INTENSITY RESEARCH

Over the past several months we have researched the implications of corporate decision-making, by analyzing various capital uses and their consequences.

Capital spending is particularly relevant today, as one of the prevailing investment controversies is when and where will inflation abate. Procurement officers and CFOs have been struggling to gauge when and how to add capacity and how much backlog to order from key suppliers. Our overall conclusion is that capital spending additions should be made conservatively, as we think the backlogs on many suppliers' balance sheets will ultimately be pushed out or cancelled. Current corporate expectations are for 9.9% earnings growth in 2022, but if excess capacity is put in place and demand slows, margin deleveraging could be meaningful in sectors including machinery and semiconductors.

Research and development is intended to drive future growth, with patent creation in software and drug development among the biggest areas of spend. In fact, **70% of growth companies report R&D on their income statement, but only 20% of value stocks even have R&D as part of their reported P&L**. Even among the businesses that report R&D, there is a substantial dispersion in intensity, ranging from mid-single digits to nearly 20% for software, as an example.

The implications of capital and R&D spending widely vary. Ultimately, one current key is the spending implications of today's capital spending on future gross margins, which vary based on asset life and the depreciation burden this has on COGS. Another, is the efficacy of today's R&D, which is often fruitless.

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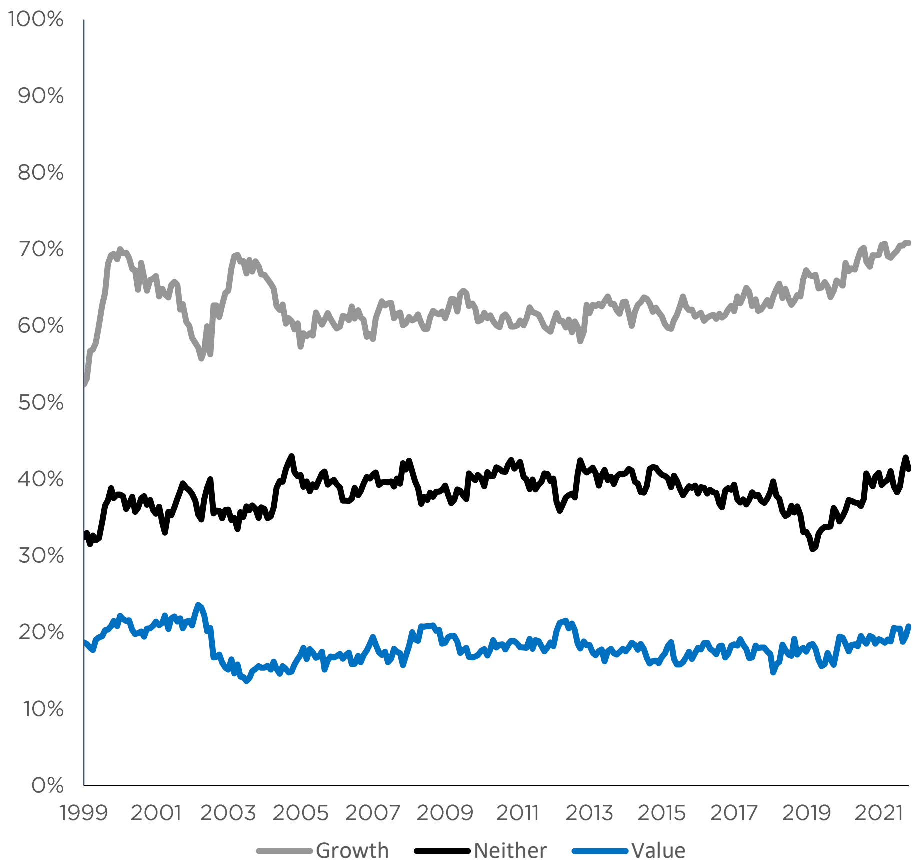
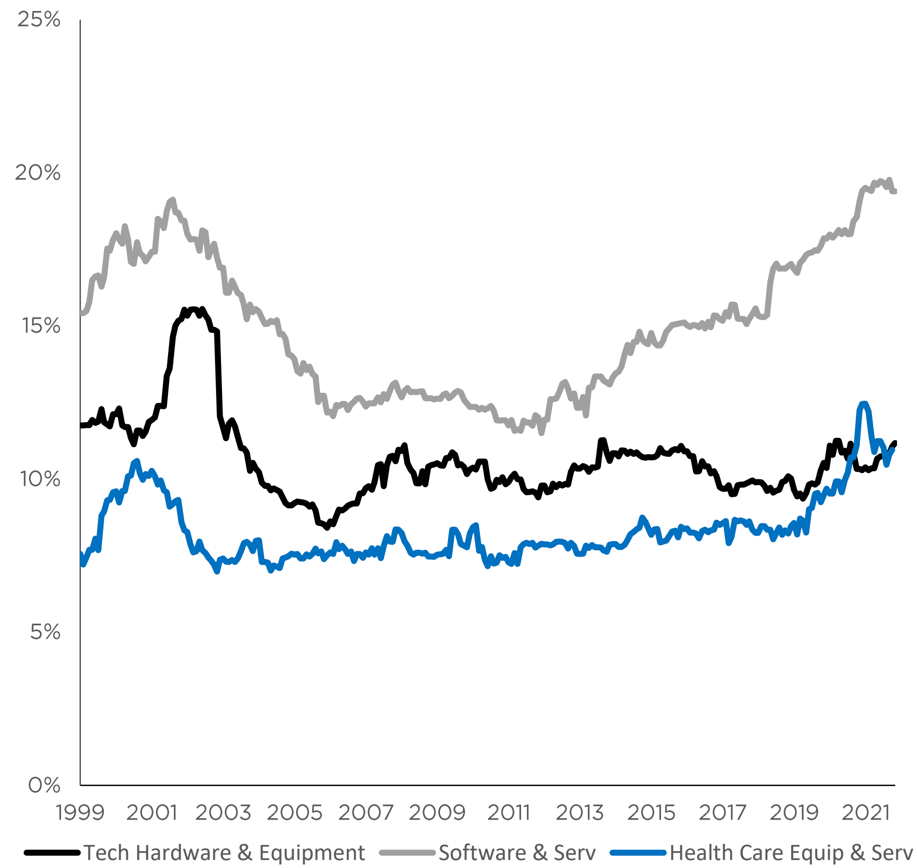
ONLY 20% OF VALUE STOCKS EVEN DO R&D

Research and development is obviously designed for growth, with patent creation, software, and drugs among the biggest areas of spend. In fact, 70% of growth companies report R&D on their income statement, but only 20% of value stocks even have R&D as part of their reported P&L (left). Even among the businesses that report R&D, there is a substantial dispersion in intensity, ranging from mid-single digits to nearly 20% for software.

Percent of Companies with RnD Activity By Style
Through End-May 2022



Median R&D-to-Sales by Group
Through End-May 2022



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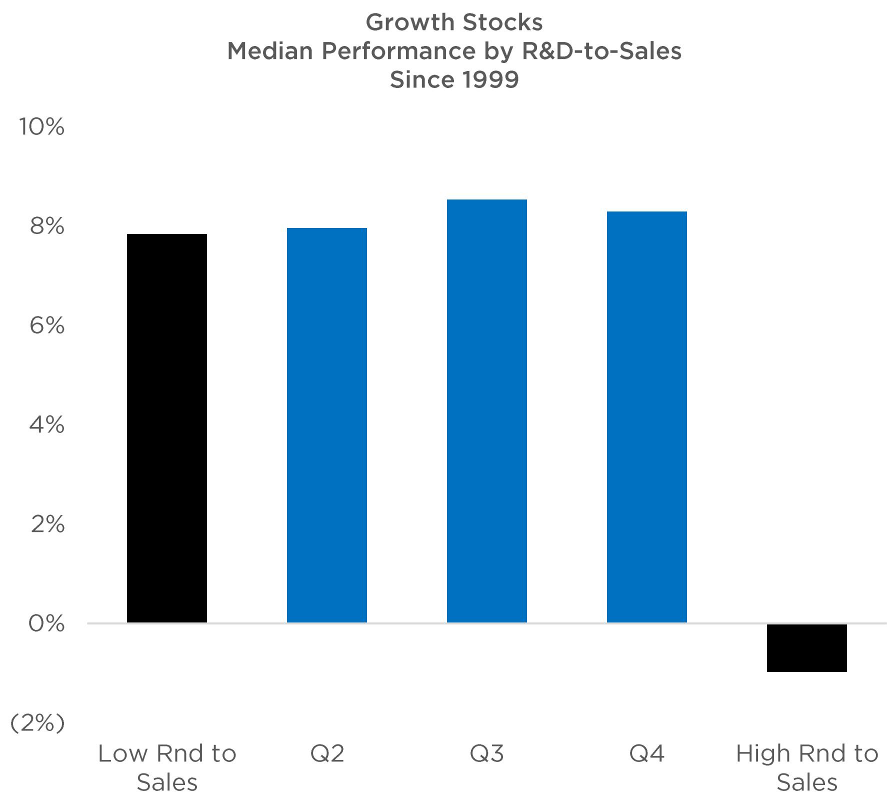
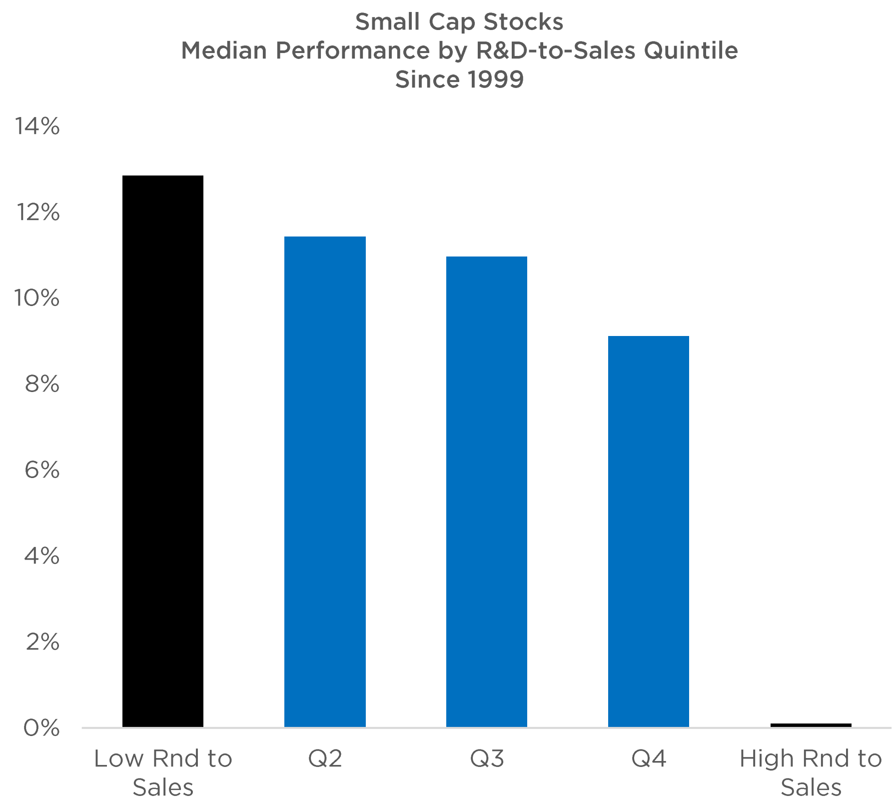
AVOIDING HIGH SPENDING SMALL CAPS IS PRUDENT

We analyzed whether level of R&D-to-sales is a good predictor of return by size, style, and substance. We found growth stocks with high R&D intensity (left) lag, but otherwise growth has obviously been good for the last 20 years. Small caps with low R&D-to-sales beat those with high R&D-to-sales by 12% per annum over the last 20 years (right), perhaps a sign that it is more a "home run" than a "batting average" for small companies.





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GOOD AND BAD CROWDING

- We defined a subset of managers, the Trivariate universe (TV managers) of 60 fundamental hedge fund managers that we believe do deep fundamental research, run relatively concentrated portfolios, and do not trade quarterly results as the core part of their strategy. We then systematically accessed the high conviction long ideas from this group of TV managers and evaluated whether adding information about high conviction from this subset could help when used in conjunction with high conviction from the broader universe. We found that there is information in the high conviction positions of our subset. **Contrary to outcomes observed from a general universe of 500 managers, when *none* of our 60 TV managers have high conviction, this is bad crowding - the returns on these stocks are inferior. On the other hand, when the TV managers do have high conviction in a stock, the performance is superior to the market and to basket of high conviction stocks from the general universe.** Therefore, there is not only information when none of the TV managers have conviction ("bad" crowding), but also when these managers do have high conviction ("good" crowding).
- Our quantitative framework ranks stocks on common attributes like valuation, sentiment, accounting, balance sheet, income statement, cash flow statement and other key metrics. We evaluated whether these models added incremental information to the fundamental high conviction ideas from our TV universe of fund managers - again, the answer is yes. **Our models, when combined with high conviction names from the TV universe, add incremental value.** When our models disagree with the TV managers, our models are on average correct.

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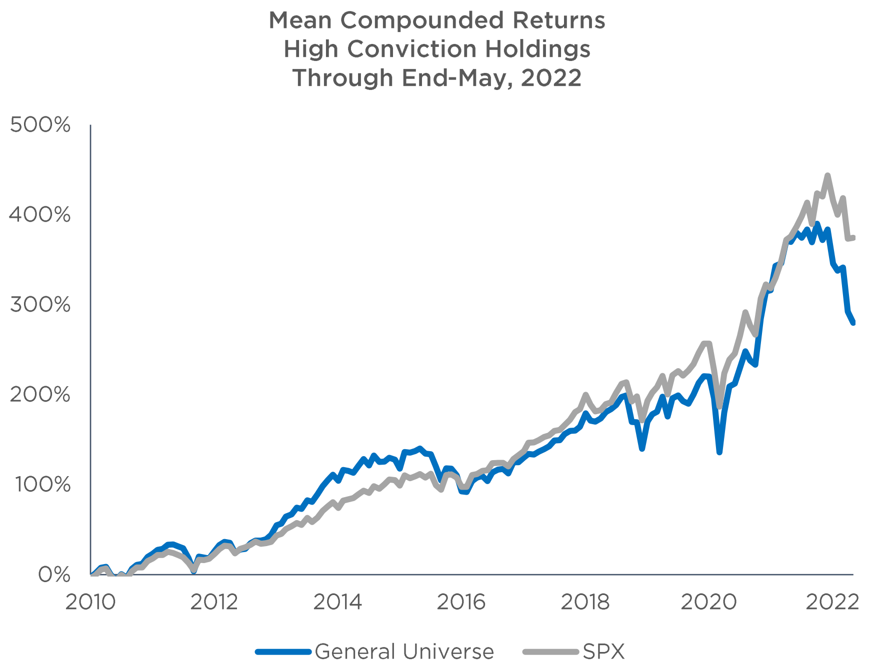
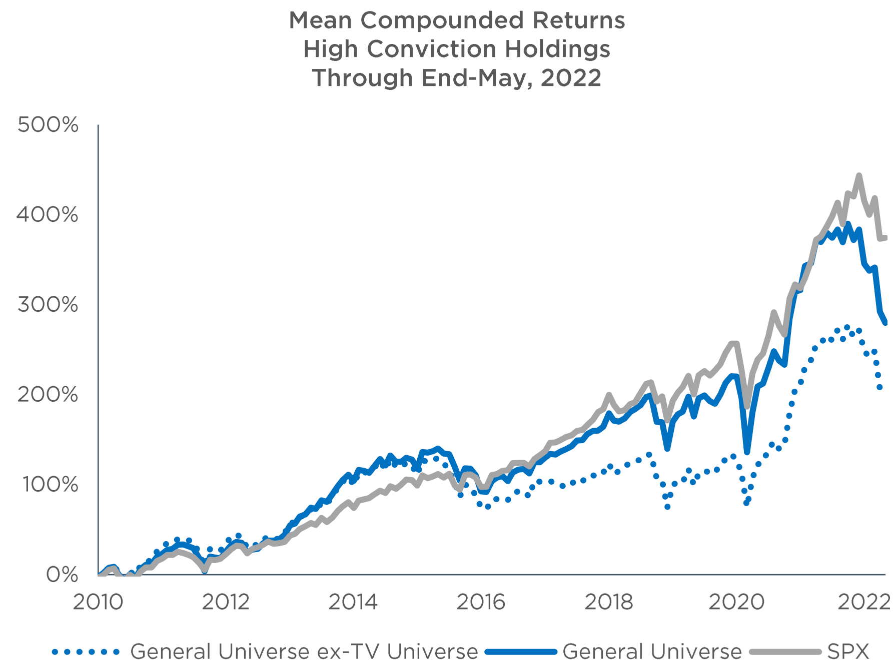
WHEN EVERYONE LOVES A STOCK THAT CAN BE BAD

We analyzed the high conviction (3% or more of long AuM) of a broad universe of 500+ hedge fund managers. **Over time, these crowded names are an inferior asset class, underperforming the SP500 and the QQQ since the Financial crisis (left chart).** We have a separate proprietary Trivariate universe (TV) of 60 fundamental hedge fund managers that we believe do deep fundamental research. In essence, we are systematically accessing the high conviction long ideas from this group of TV managers. We evaluated whether adding information about high conviction from the TV universe could help when used in conjunction with high conviction from the broader universe. **When *none* of our Trivariate managers have high conviction, this is "bad" crowding - the returns are materially lower.** This is a risk that managers can systematically track.





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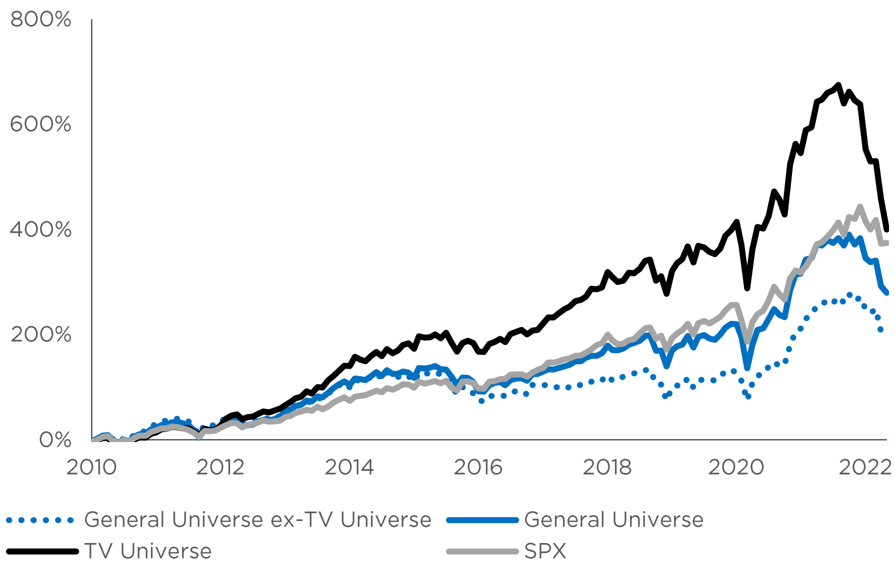
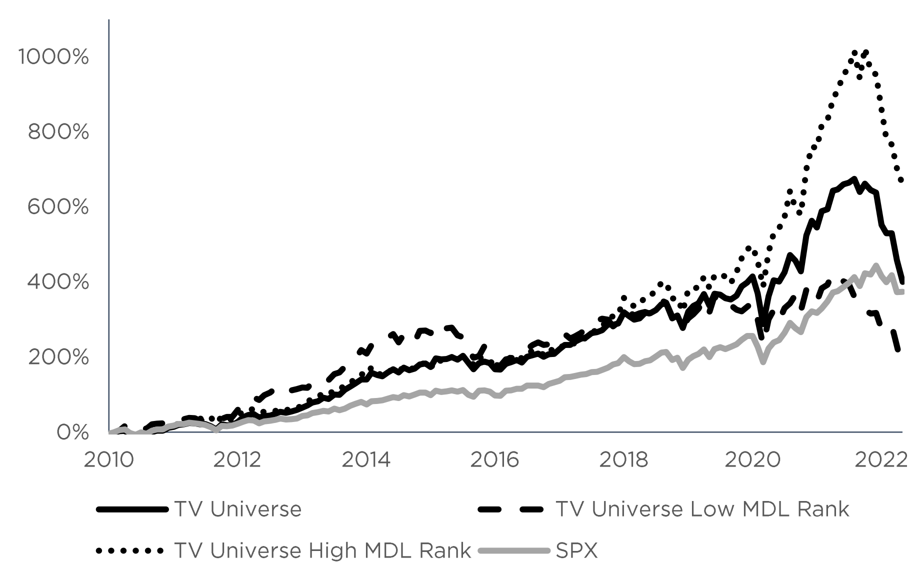
BUT WHEN OUR UNIVERSE LIKES IT THAT IS OK

When our universe of managers *does* have high conviction in a stock, the performance is superior to the market. Therefore, there is not only information when *none* of our managers have conviction (bad crowding), but also when these managers *do* have high conviction (good crowding). Our quantitative framework ranks stocks and we evaluated whether these models added incremental information to the fundamental high conviction ideas from our Trivariate universe of fund managers. **Our models, when combined with high conviction names from 13F filings, add incremental value.** When our models disagree with our universe of managers, our models provide substantial additional information. “Good” crowding happens when the TV universe has high conviction in a stock and our quant models rank that stock in the top quintile. The last two months this basket has been weak.

Mean Compounded Returns
High Conviction Holdings
Through End-May, 2022



Mean Compounded Returns
High Conviction Holdings
Through End-May, 2022



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BUY / SHORT IDEAS BASED ON GOOD / BAD CROWDING FRAMEWORK

Our buy list of "good crowded" names are one that funds in our proprietary universe own in high conviction and screen well in our quantitative model. Short ideas are owned in high conviction and screen poorly in our quantitative models. Based on crowding, longs include GOOGL, TSLA and FB, shorts include AAPL and NVDA.

Buy High Conviction by Trivariate Universe with High Model Rank
Short High Conviction and Have a Low Model Rank
May 31, 2022

Longs				Shorts			
Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)	Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
GOOGL	Alphabet Inc.	Media & Entertainment	1499.98	AAPL	Apple Inc.	Technology Hardware & Equipment	2409.00
TSLA	Tesla, Inc.	Automobiles & Components	785.56	NVDA	NVIDIA Corporation	Semis & Semi Equip.	467.55
FB	Meta Platforms, Inc.	Media & Entertainment	524.05	BMY	Bristol-Myers Squibb Company	Pharma, Biotech & Life Sci.	160.64
UNH	UnitedHealth Group Incorporated	Health Care Equip. & Serv.	466.06	BX	Blackstone Inc.	Diversified Financials	82.54
V	Visa Inc.	Software & Services	441.99	ABNB	Airbnb, Inc.	Consumer Services	76.93
MA	Mastercard Incorporated	Software & Services	348.08	GM	General Motors Company	Automobiles & Components	56.40
WFC	Wells Fargo & Company	Banks	173.48	MELI	MercadoLibre, Inc.	Retailing	39.59
SCHW	The Charles Schwab Corporation	Diversified Financials	132.93	CPRT	Copart, Inc.	Commercial & Pro. Serv.	27.20
NOW	ServiceNow, Inc.	Software & Services	93.71	WAB	Westinghouse Air Brake Technologies Corporation	Capital Goods	17.25
MRVL	Marvell Technology, Inc.	Semis & Semi Equip.	50.27	LSXMK	The Liberty SiriusXM Group	Media & Entertainment	13.70
PANW	Palo Alto Networks, Inc.	Software & Services	50.09	CTXS	Citrix Systems, Inc.	Software & Services	12.75
SNOW	Snowflake Inc.	Software & Services	40.60	FHN	First Horizon Corporation	Banks	12.21
WDAY	Workday, Inc.	Software & Services	39.70	BKI	Black Knight, Inc.	Software & Services	10.49
AVTR	Avantor, Inc.	Pharma, Biotech & Life Sci.	19.56	IAC	IAC/InterActiveCorp	Media & Entertainment	7.67
EQT	EQT Corporation	Energy	17.63	USFD	US Foods Holding Corp.	Food & Staples Retailing	7.42
RH	RH	Retailing	7.15	NXST	Nexstar Media Group, Inc.	Media & Entertainment	7.08
NYT	The New York Times Company	Media & Entertainment	5.78	TGNA	TEGNA Inc.	Media & Entertainment	4.88
BC	Brunswick Corporation	Consumer Durables & App.	5.70	NCR	NCR Corporation	Software & Services	4.74
				VAL	Valaris Limited	Energy	4.46

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ANY RELATIVE DOVISHNESS WILL CHANGE THE MARKET STRUCTURE

The anticipation of rate hikes leads actual rate hikes. There is not a statistically significant relationship between changes in the level and slope of interest rates (2-year yield, 10-year yield, 10-year minus 2-year yield) and beta-adjusted growth stock returns. However, there was a strong relationship between changes in perceptions about interest rates (the Fed Fund Futures Curve) and growth stock investing from late 2021 through earlier this year. Our judgment is that the key to growth stocks working appears to be a moderation in the perception about Fed hawkishness.

Within the growth universe, performance of the software, biotechnology, IT services, and healthcare technology industries all had a statistically significant and negative relationship to changes in perceptions about the Fed Funds rate when the street was getting much more hawkish. While semiconductors performed poorly earlier this year, their performance is not statistically significantly associated with perception about rate changes. Perhaps semis are a good place to look for long ideas.

Among the stocks with a high and significant negative relationship to perceptions about inflation, we think the biotechnology sell-off is overdone, with mid-cap. biotechnology at a ten-year low on relative price-to-sales. Only 15% of all biotechnology companies EVER generate cumulative positive free cash flow and most biotechnology companies that do eventually generate cash take on average five years to do so. Perceptions about Fed Fund futures likely will dramatically change several times in the interim. For stocks with high and positive relationships to the perception of rising Fed Fund rates, we prefer materials to select staples.

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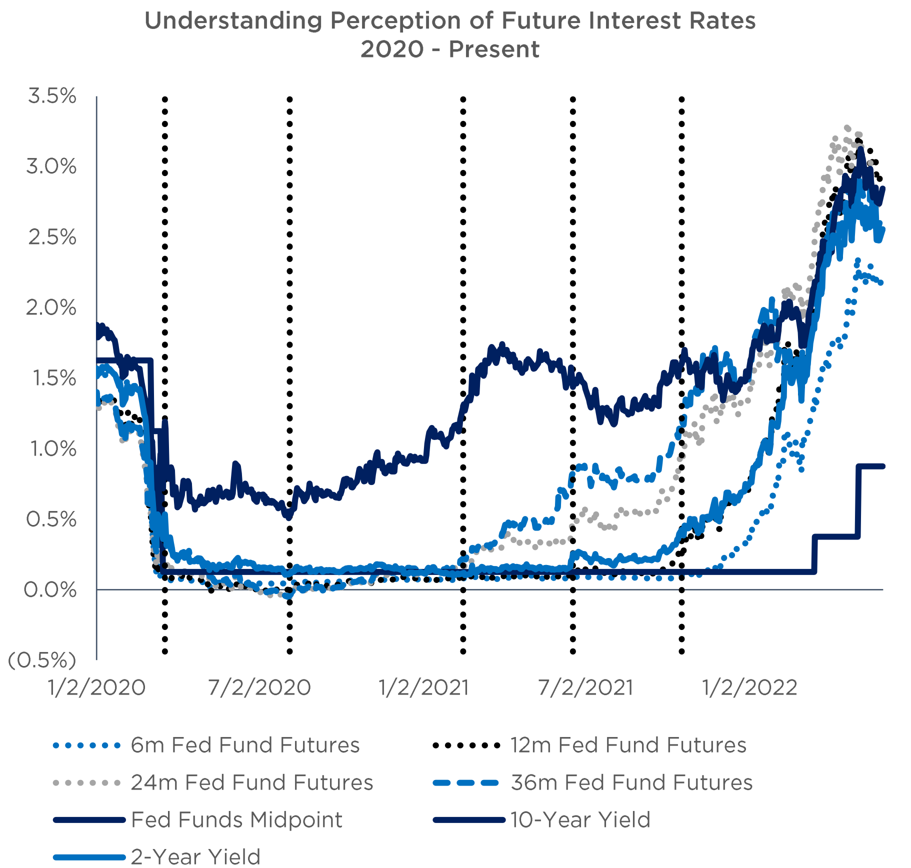
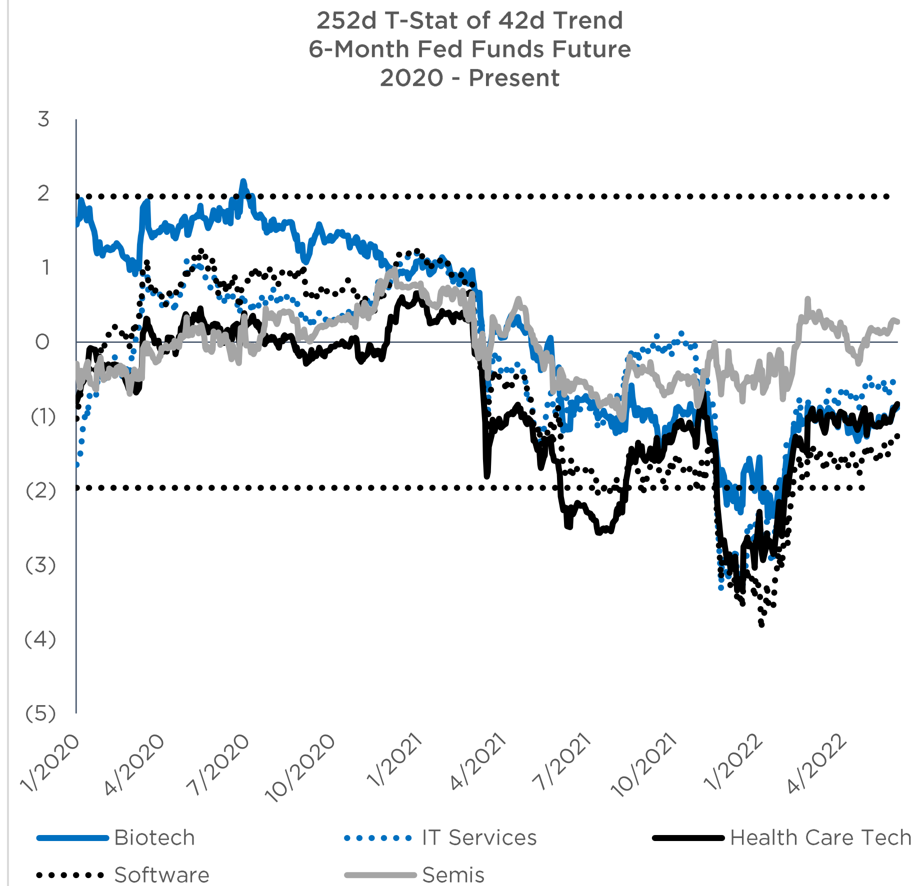
PERCEPTIONS OF INTEREST RATES LED ACTUAL INTEREST RATES

We show the Fed Fund futures moves for 6-,12-,24-, and 36-months over the last two years (left chart). The five vertical lines are 3/18/2020 (Initial COVID crash), 8/5/2020 (10-year yield bottoms), 2/15/2021 (longer-term Fed Fund Futures start to rise), 6/18/2021 (longer-term Fed funds slow), and 10/18/21 (an anticipation of the Fed pivot). Perception about Future Fed Funds Rates is clearly distinct from the actual rates (particularly the 24-and 36-month horizons) and has moderated of late. Additionally, (right chart) biotech, software, and healthcare tech's returns were statistically significantly correlated to the Fed Fund Futures, though today there is zero correlation.





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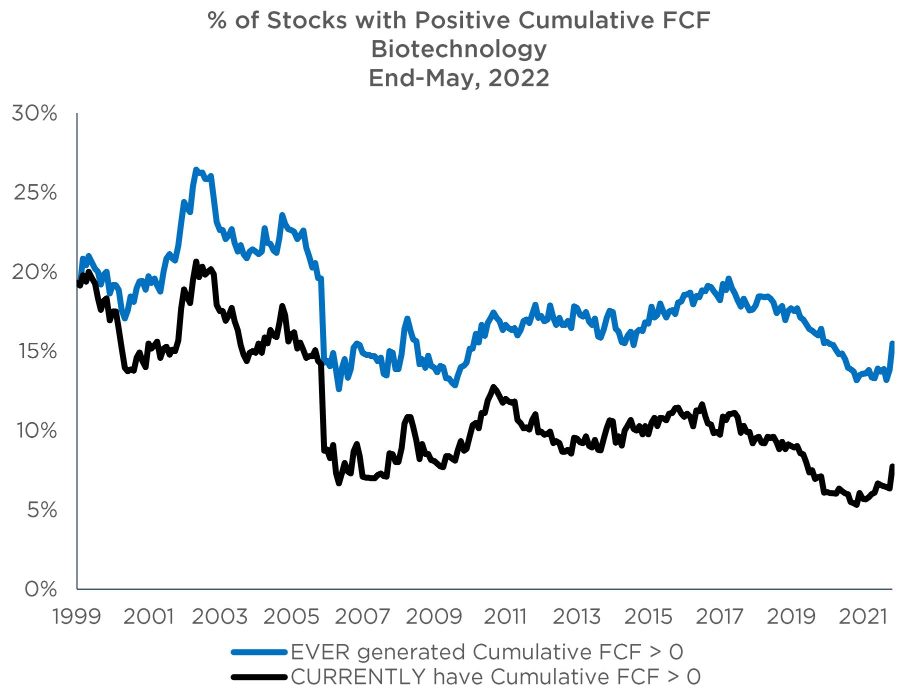
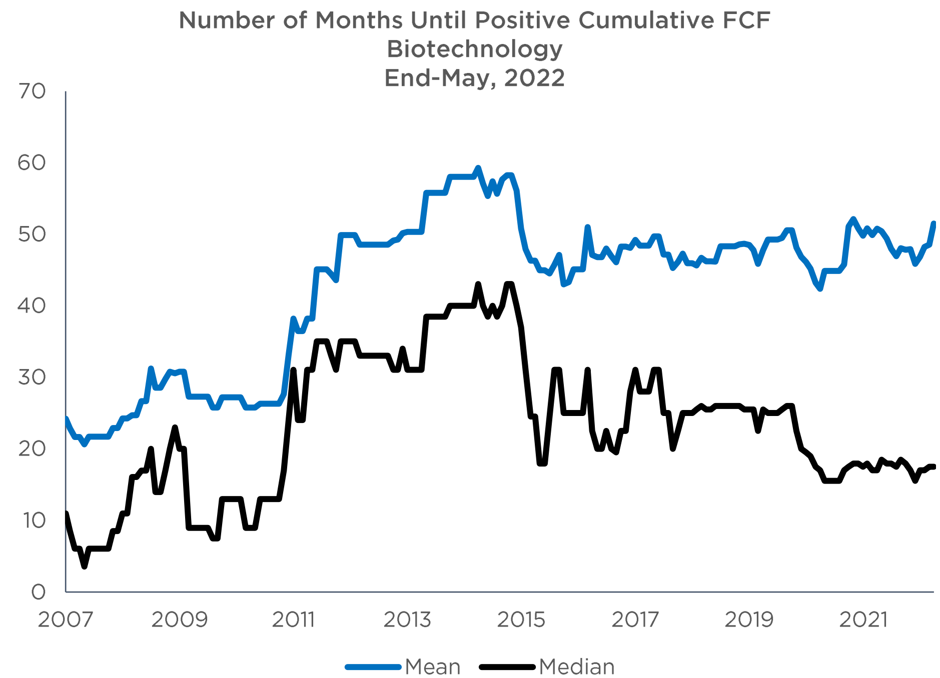
IS THE BIOTECH SELL-OFF OVERDONE?

We suspect that any perception of dovishness will cause a rebound in the most negatively impacted areas. We think the biotech sell-off is overdone (as we pointed out in our December healthcare note, mid-cap. biotechnology is at a ten-year low on relative price-to-sale after a ~50% correction – that turned out to be way too early). First, only 15% of all biotechnology companies EVER generate cumulative positive free cash flow (left chart). So what terminal value is even impaired? The best argument is that these companies will have a higher cost of capital, but that merits a correction of 5-15% at most, not ~70%! If most of the value is in the terminal value, then rising short-term rates should not impair something more than ten years out, as at that point, we will probably be onto the next rate cycle. Secondly, most companies that do eventually generate cash take on average five years to do so – and perceptions about Fed Fund futures likely dramatically change several times in the interim (right).





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HOW DO WE ASSESS WHERE ARE WE ARE TODAY?

We created twelve proprietary indices using over 100 variables that systematically process "macro" data. The macro data have various frequencies, ranging from daily through monthly and are downloaded from Bloomberg, except for corporate profitability and company-specific risk data, which we compute. We smooth and transform the data to create twelve indices or gauges of where we are in the investing world today. Our proprietary gauges include:

1. Economic activity
2. Consumer activity
3. Corporate profitability
4. Financial conditions
5. Currency
6. The slope and level of the US Treasury yield curve
7. Industrial activity
8. China activity
9. European activity
10. Oil
11. Commodities
12. Company-specific risk

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MACRO IS MATTERING MORE, AND PEAKING IN MANY AREAS

Many of our signals have multiple inputs (right side of below chart) and are designed to capture larger and longer-term trends, not shorter-term / smaller counter-trend movements. When we look at our 12 gauges (listed alphabetically below) most are generally increasing / improving. The consumer remains very strong. Economic and industrial activity have both plateaued this month after rising the previous year. The 6-month and 12-month curves are bear flattening. Financial conditions are tightening. The dollar is strengthening. Commodities and oil are generally rising and company-specific risk is falling.

Current Regime for Each Macro Signal

Macro Signal	Current Regime	Examples of Components
China	Decreasing	Fiscal Expenditures, New Auto Registrations, Electricity Consumption, Exports, Consumer Confidence, Financial Conditions, Residential Property Sales, 10-Year Yield
Commodities	Increasing	Aluminum, Corn, Cotton, Copper, Lumber, Natural Gas, Soybeans, Sugar, Silver
Consumer Activity	Level	Credit Card Delinquency, Retail Sales, Consumer Confidence, Wage Growth, Unemployment
Corporate Profitability	Decreasing	Operating Margin, 1-Year FWD Earnings Expectations, 2-Year FWD Earnings Expectations
Company-Specific Risk	Decreasing	The amount unexplained by our 7-factor model
Currency	Dollar Strengthening	AUD, CAD, CHF, DXY, EUR, GBP, INR, JPY, SEK
Economic Activity	Level	CEO Confidence, Inflation, Philly Fed Business Outlook, Small Business Optimism, Leading Indicators
Europe	Increasing	Financial Conditions, 5y5y Forward Break-evens, Unemployment, Consumer Confidence, CDS Spreads
Financial Conditions	Tightening	Credit Spreads, US Treasury Implied Volatility, 30-Year Fixed Mortgage Rates
Industrial Activity	Level	Dry Van Rate per Mile, Baker Hughes Total Rig Count, AAR N. America Total Carloads, US Capacity Utilization, Private Non-Residential Construction, US C&I Loans
Oil	Increasing	WTI, Brent
Yield Curve 63d	Level	US 2-Year Yield, US 10-Year Yield
Yield Curve 126d	Bear Flattening	US 2-Year Yield, US 10-Year Yield
Yield Curve 252d	Bear Flattening	US 2-Year Yield, US 10-Year Yield

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WHAT SHOULD WE DO ABOUT IT?

1. We define macro regimes and see whether our quantitative models work better or worse during different regimes. Because of substantial moves in financial conditions, currency, commodities, oil, and a leveling-off in consumer activity, we see lots of conflicting data that does not permit us to make high conviction gross exposure recommendations.
2. Versus last month, this is reducing exposure to discretionary stocks because our consumer activity gauge is no longer increasing. Furthermore, we find it difficult to pick winners from losers in banks when financial conditions are tightening.

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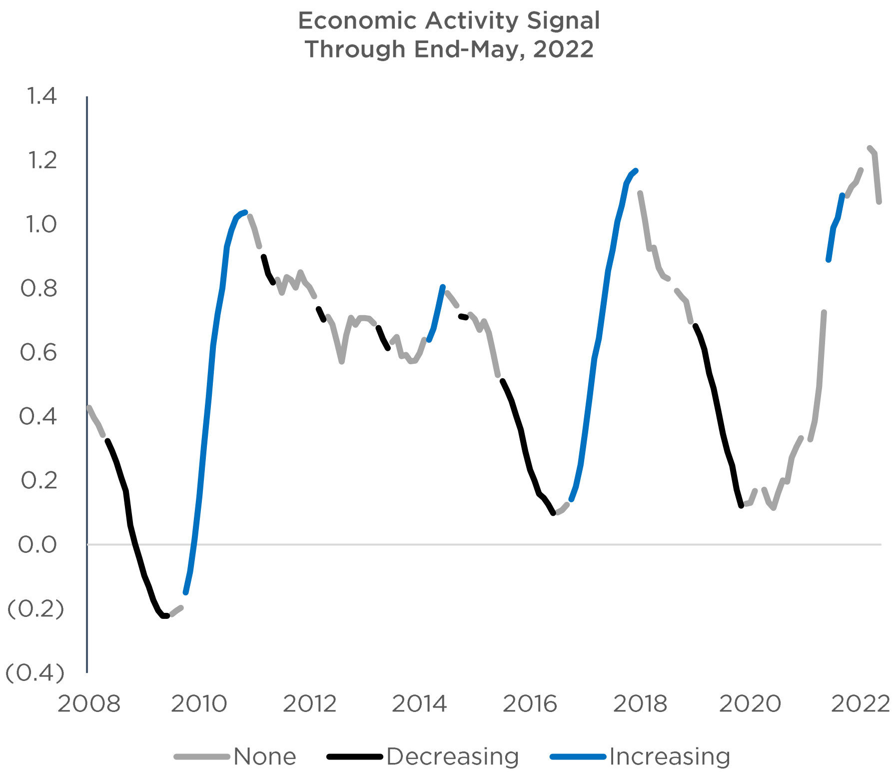
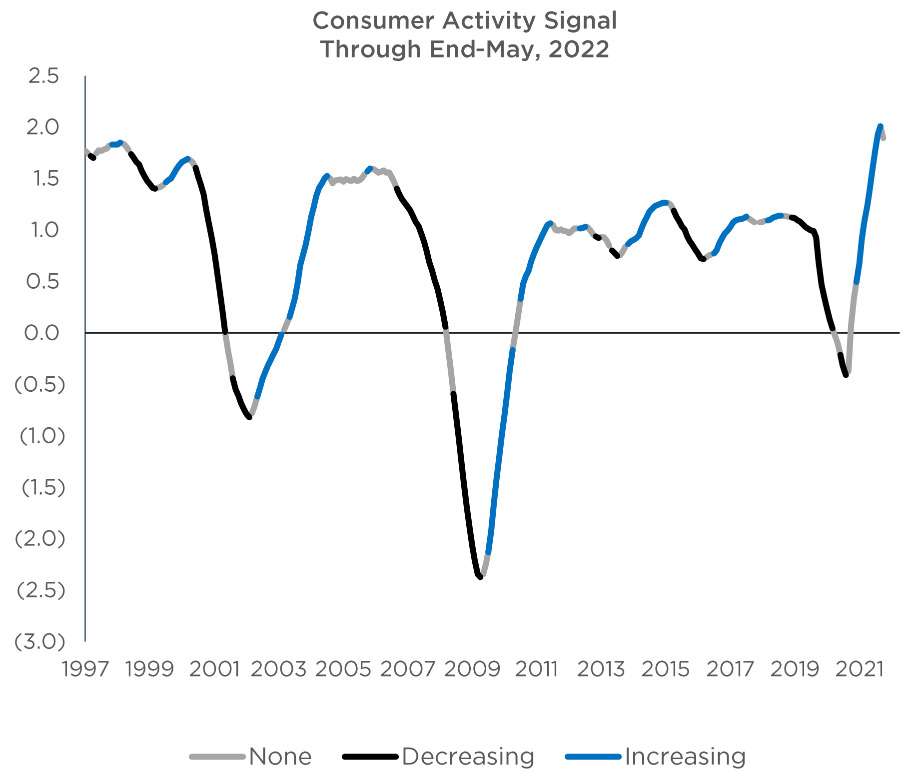
ECONOMIC AND CONSUMER ACTIVITY LEVELING OFF

We show the economic and consumer activity gauges below. We evaluate where we are in the economic activity cycle by looking at variables like CEO Confidence, Philly Fed Business Outlook, Small Business Optimism, US Economic Surprise, US LEI, US 5y5y Forward Breakeven, etc. The gauge has been rolling over for four months (left chart). Our consumer activity, driven by jobs, wages, retail sales, and consumer confidence, among other macro variables just flattened this month (right chart).





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GROSS DOWN BOTH TMT AND CONSUMER DISCRETIONARY

Our economic activity gauge has stopped increasing, and that caused us to recommend reducing our gross exposure to TMT stocks a few months ago. The left chart shows that our quantitative models perform far better in the TMT cohort at picking winners from losers when economic activity is increasing. Our consumer discretionary quantitative model (right) performs better when our consumer activity gauge is increasing, with a hit rate of 71.9% vs. 60.2% when activity is not increasing an that just leveled off in May. We create our 12 gauges for two purposes – one to unemotionally evaluate conditions, and two, is to use the regime shifts as timing gauges for our quant models, which ultimately aid in sizing recommendations.

TMT Model Performance Through End-May, 2022

Stat (Beta-Adjusted)	Economic Activity Increasing	Economic Activity Not Increasing	Difference
Weighted Mean	14.7%	6.1%	8.6%
Weighted Median	16.8%	4.9%	11.8%
Weighted Information Ratio	1.66	0.65	1.01
Hit Rate	65.7%	53.9%	11.8%

Discretionary Model Performance Through End-May, 2022

Stat (Beta-Adjusted)	Consumer Activity Increasing	Consumer Activity Not Increasing	Difference
Weighted Mean	14.6%	(10.4%)	4.2%
Weighted Median	19.9%	13.9%	6.0%
Weighted Information Ratio	1.25	0.92	0.33
Hit Rate	71.9%	60.2%	11.7%

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IF RISKS DID NOT CHANGE, ANYONE COULD DO RISK MANAGEMENT

Four key risks worth monitoring:

1. **High signal correlation:** Variables both fundamental managers and quants use to pick winners from losers are highly correlated in industrials – REITS were but this has moderated
2. **COVID:** Quality "reopening" stocks have still massively underperformed "junk" "work from home" stocks – monitor exposure of "substance" and "work from home" / "reopening".
3. **Correlations during downturns:** Many stocks become more correlated to other names during market sell-offs than during "normal" times, and an assessment of drawdowns can help locate better hedges.
4. **Asymmetric betas:** Measure beta during downturns as there appears to be a consistent group of stocks that have much higher betas during market corrections than "normal" times –many of these are REITS.

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RISK ONE: HIGHLY CORRELATED SIGNALS IN INDUSTRIALS

We analyzed all 21 of our quantitative models to see if signals have become increasingly correlated recently. The two biggest risks we see are the increased correlation in REITS and industrials. For both, we have a model comprised of eight signals to predict subsequent 18-month returns for stocks in that industry. There were sustained periods during our model development (2012-2017) where the average pairwise correlation of these signals was near zero (even briefly negative). While REITS signals have now reverted closer to average, industrials signals have not, meaning variables used to pick winners from losers in the past will likely not be effective today.

REITS and Industrials Cohort Model
Average 21-Day Pairwise Correlation
Through End-May, 2022

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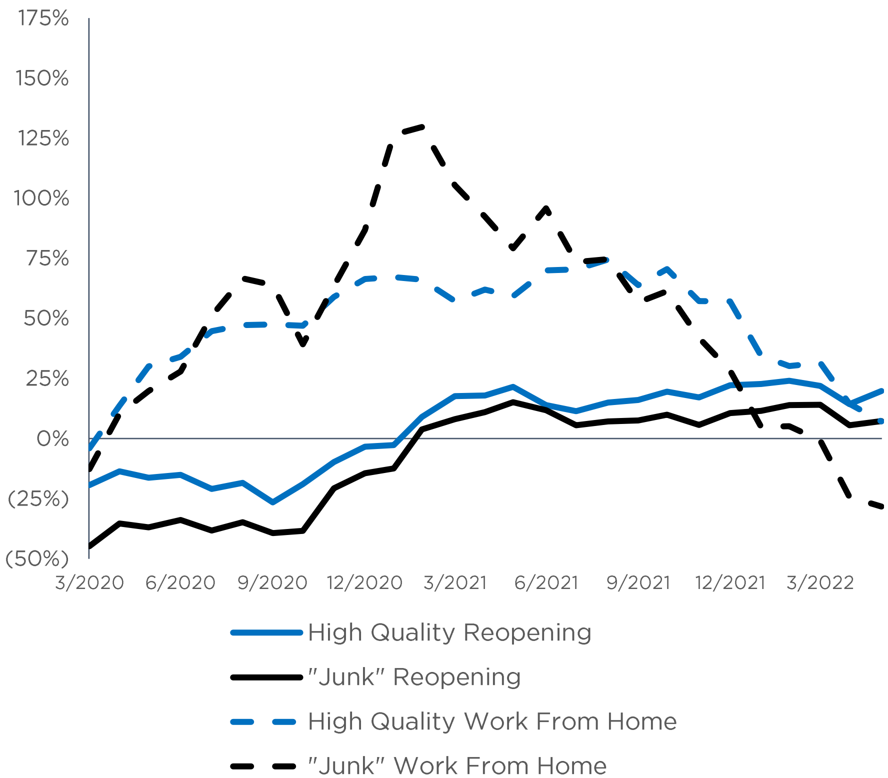
RISK TWO: QUALITY / JUNK AND REOPENING / WORK-FROM-HOME

We created "work from home" and "reopening" baskets and looked at the correlation of every stock in our universe to both baskets – clearly this was a major new risk to monitor that formed last year. Given the simultaneous move in "junk" and "reopening", we looked at performance of work from home quality and junk and reopening quality and junk since March of 2020 (left exhibit). Investors should monitor each stock's exposure. We think quality reopening should outperform junk work from home and junk reopening from here (right exhibit for ideas).

Compounded Median Return
Reopening vs. Work-from-Home, High Quality vs. Junk
Through End-May, 2022



Buy High Quality Reopening, Sell "Junk" Work-from-Home Names and "Junk" Reopening Names in Top/Bottom Trivariate Model Quartile with Market Cap. of at least $1 Bil.
End-May, 2022

Long

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
CVX	Chevron Corporation	Oil, Gas & Consumable Fuels	343.17
EOG	EOG Resources, Inc.	Oil, Gas & Consumable Fuels	80.22
CF	CF Industries Holdings, Inc.	Chemicals	20.6

Short

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
LCID	Lucid Group, Inc.	Automobiles	33.66
RCL	Royal Caribbean Cruises Ltd.	Hotels, Restaurants & Leisure	14.81
APP	AppLovin Corporation	Software	14.41
DKNG	DraftKings Inc.	Hotels, Restaurants & Leisure	5.66

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RISK THREE: BEAR CASE CORRELATIONS THAT RISE

We analyzed stock performance during market drawdowns of 10% or more and noticed that some stocks become increasingly correlated during market pullbacks. We like to monitor "bear case" correlations so we are not misled about the portfolio being hedged or defensive when there is a measurable phenomena during downturns.

Names with Higher 126d Correlations to Peers During SPX Drawdowns of at Least 10%
End-May, 2022

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
WMT	Walmart Inc.	Food & Staples Retailing	354.09
PFE	Pfizer Inc.	Pharmaceuticals	297.6
VZ	Verizon Communications Inc.	Diversified Telecommunication Services	215.4
COST	Costco Wholesale Corporation	Food & Staples Retailing	206.55
ORCL	Oracle Corporation	Software	191.89
T	AT&T Inc.	Diversified Telecommunication Services	152.41
TGT	Target Corporation	Multiline Retail	75.06
EW	Edwards Lifesciences Corporation	Health Care Equipment & Supplies	62.7
PSA	Public Storage	Equity Real Estate Investment Trusts (REITs)	58.04
ORLY	O'Reilly Automotive, Inc.	Specialty Retail	41.88
AZO	AutoZone, Inc.	Specialty Retail	40.32
DLR	Digital Realty Trust, Inc.	Equity Real Estate Investment Trusts (REITs)	39.74
CTSH	Cognizant Technology Solutions Corporation	IT Services	38.93
AVB	AvalonBay Communities, Inc.	Equity Real Estate Investment Trusts (REITs)	29.04
EQR	Equity Residential	Equity Real Estate Investment Trusts (REITs)	28.89
CTRA	Coterra Energy Inc.	Oil, Gas & Consumable Fuels	27.66
EFX	Equifax Inc.	Professional Services	24.78
PCG	PG&E Corporation	Electric Utilities	24.25
K	Kellogg Company	Food Products	23.56
BALL	Ball Corporation	Containers & Packaging	22.67
CLX	The Clorox Company	Household Products	17.89
EVRG	Evergy, Inc.	Electric Utilities	16.05
CPT	Camden Property Trust	Equity Real Estate Investment Trusts (REITs)	15.28
ELS	Equity LifeStyle Properties, Inc.	Equity Real Estate Investment Trusts (REITs)	14.08
SWN	Southwestern Energy Company	Oil, Gas & Consumable Fuels	10.18
LSI	Life Storage, Inc.	Equity Real Estate Investment Trusts (REITs)	9.84
ERIE	Erie Indemnity Company	Insurance	7.75
DNB	Dun & Bradstreet Holdings, Inc.	Professional Services	7.5
USM	United States Cellular Corporation	Wireless Telecommunication Services	2.63

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RISK FOUR: NEGATIVE ASYMMETRIC BETA

We analyzed the beta of stocks during periods where the market is down 10% or more. Many of these stocks with the highest negative asymmetric betas are REITS (left side). Non-REITs are shown on the right. This list represents names where we expect high underperformance in a market drawdown.

Names with Higher 252d Betas During SPX Drawdowns of at Least 10%
End-May, 2022

REITs

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
PSA	Public Storage	REITs	58.04
O	Realty Income Corporation	REITs	41.04
DLR	Digital Realty Trust, Inc.	REITs	39.74
SPG	Simon Property Group, Inc.	REITs	37.68
SBAC	SBA Communications Corporation	REITs	36.3
AVB	AvalonBay Communities, Inc.	REITs	29.04
EQR	Equity Residential	REITs	28.89
ARE	Alexandria Real Estate Equities, Inc.	REITs	27.09
EXR	Extra Space Storage Inc.	REITs	23.93
MAA	Mid-America Apartment Communities	REITs	20.89
ESS	Essex Property Trust, Inc.	REITs	18.54
BXP	Boston Properties, Inc.	REITs	17.42
PEAK	Healthpeak Properties, Inc.	REITs	16.02
CPT	Camden Property Trust	REITs	15.28
UDR	UDR, Inc.	REITs	15.22
KIM	Kimco Realty Corporation	REITs	14.62
ELS	Equity LifeStyle Properties, Inc.	REITs	14.08
LSI	Life Storage, Inc.	REITs	9.84
NNN	National Retail Properties, Inc.	REITs	7.79
ADC	Agree Realty Corporation	REITs	5.22
CUZ	Cousins Properties Incorporated	REITs	5.14
HR	Healthcare Realty Trust Incorporated	REITs	4.41
HIW	Highwoods Properties, Inc.	REITs	4.13
EQC	Equity Commonwealth	REITs	3.07
STAR	iStar Inc.	REITs	1.44

Non-REITs

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
ABBV	AbbVie Inc.	Biotechnology	260.42
VZ	Verizon Communications Inc.	Diversified Telecom Services	215.4
CME	CME Group Inc.	Capital Markets	71.46
ICE	Intercontinental Exchange, Inc.	Capital Markets	57.38
ORLY	O'Reilly Automotive, Inc.	Specialty Retail	41.88
NDAQ	Nasdaq, Inc.	Capital Markets	25.57
LEN	Lennar Corporation	Household Durables	23.23
LYV	Live Nation Entertainment, Inc.	Entertainment	21.62
CMS	CMS Energy Corporation	Multi-Utilities	20.61
YUMC	Yum China Holdings, Inc.	Hotels, Rest. & Leisure	19.16
TWLO	Twilio Inc.	IT Services	19.11
MKTX	MarketAxess Holdings Inc.	Capital Markets	10.63
DECK	Deckers Outdoor Corporation	Textiles, App. & Lux. Goods	7.32
GPK	Graphic Packaging Holding Company	Containers & Packaging	6.86
CIVI	Civitas Resources, Inc.	Oil, Gas & Consumable Fuels	6.49
TDOC	Teladoc Health, Inc.	Health Care Technology	5.49
UBSI	United Bankshares, Inc.	Banks	5.07
ALKS	Alkermes plc	Biotechnology	4.88
EXLS	ExlService Holdings, Inc.	IT Services	4.73
SNDR	Schneider National, Inc.	Road & Rail	4.3

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TRIVARIATE SECTOR OVERVIEW: SUMMARY RECOMMENDATIONS

Our sector recommendations are shown here- there are nuances to the recommendations, but high level we like energy / materials over industrials, discretionary over staples, utilities over real estate, and healthcare over technology. Within technology, we prefer margin expansion and positive FCF to the "go-go" profitless but high growth group.

Trivariate Sector Recommendations

Sector	Total S&P 500 Market Cap. (US$ Bil.)	Current S&P 500 Weight	Trivariate-Recommended Weight	Trivariate-Relative Weight	Trivariate Recommendation	Comments
Materials	**984.24**	**2.56%**	7.00%	4.44%	Overweight	Buy the cheap stocks with upward revisions
Health Care	**5,124.97**	**13.31%**	17.00%	3.69%	Overweight	Healthcare services have cheap growth, and the biotechnology sell-off appears over-done
Energy	**1,699.91**	**4.41%**	8.00%	3.59%	Overweight	Supply won't catch up to demand for a while
Information Technology	**9,816.62**	**25.49%**	27.00%	1.51%	Equal-Weight	Focus on positive FCF, pricing power, and avoid profitless software
Utilities	**1,043.62**	**2.71%**	4.00%	1.29%	Equal-Weight	Many short ideas but some idiosyncratic bets
Real Estate	**993.92**	**2.58%**	2.00%	(0.58)%	Equal-Weight	Metrics for stock selection are becoming more effective, commercial remains challenged
Consumer Discretionary	**4,190.40**	**10.88%**	10.00%	(0.88)%	Equal-Weight	Value looks cheap, growth expensive, low-end slowing more than high-end
Financials	**4,202.04**	**10.91%**	10.00%	(0.91)%	Equal-Weight	Large cap looks cheaper than small cap
Communications Services	**5,013.26**	**13.02%**	10.00%	(3.02)%	Equal-Weight	Makes sense to keep market-weight FAANGM
Industrials	**2,826.54**	**7.34%**	3.00%	(4.34)%	Underweight	Transportation is rolling over, but earnings expectations are very high despite recent downward revisions
Consumer Staples	**2,614.71**	**6.79%**	2.00%	(4.79)%	Underweight	Plenty of short ideas in idiosyncratic staples, and valuation of large-caps is stretched

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CAN YOU STILL OWN ENERGY AND MATERIALS?

Oil and many underlying commodities levelled-off last month after huge moves the preceding six months.

For energy, rising oil means higher earnings revisions and higher net income for the group, and even with the recent sharp correction the longer-term trajectory has been higher for oil. Earnings revisions are highly effective at picking winners from losers within the cohort for the 6-months following periods when oil is rising, likely meaning energy stocks beating estimates will still perform strongly. In addition, despite the strong rally (energy was the best performing sector last year), the sector remains attractively valued on price-to-book, which historically was the most efficacious valuation metric for picking energy stocks. It is VERY infrequent in the last decade where a sector has positive revisions, positive momentum, and cheap valuation versus history. Despite what seems to be sustained demand growth exceeding supply growth for the sustainable future, there is a lot of negative sentiment, and firms have dropped coverage or don't have analysts. We think oil-sensitive equities have incredibly attractive risk-reward.

For materials, the huge year-over-year move in commodities nearly guarantees the sector is poised to good earnings this year, even if lower than 2021 for many companies. Despite this, **valuations embed a collapse in earnings, as they are hovering near 18-year lows vs. the market excluding materials as people assume earnings will collapse.** Revisions and valuation also work here so we offer long ideas in energy and materials, and we recommend investors own this group as the underlying commodities likely still rise over the next several months.

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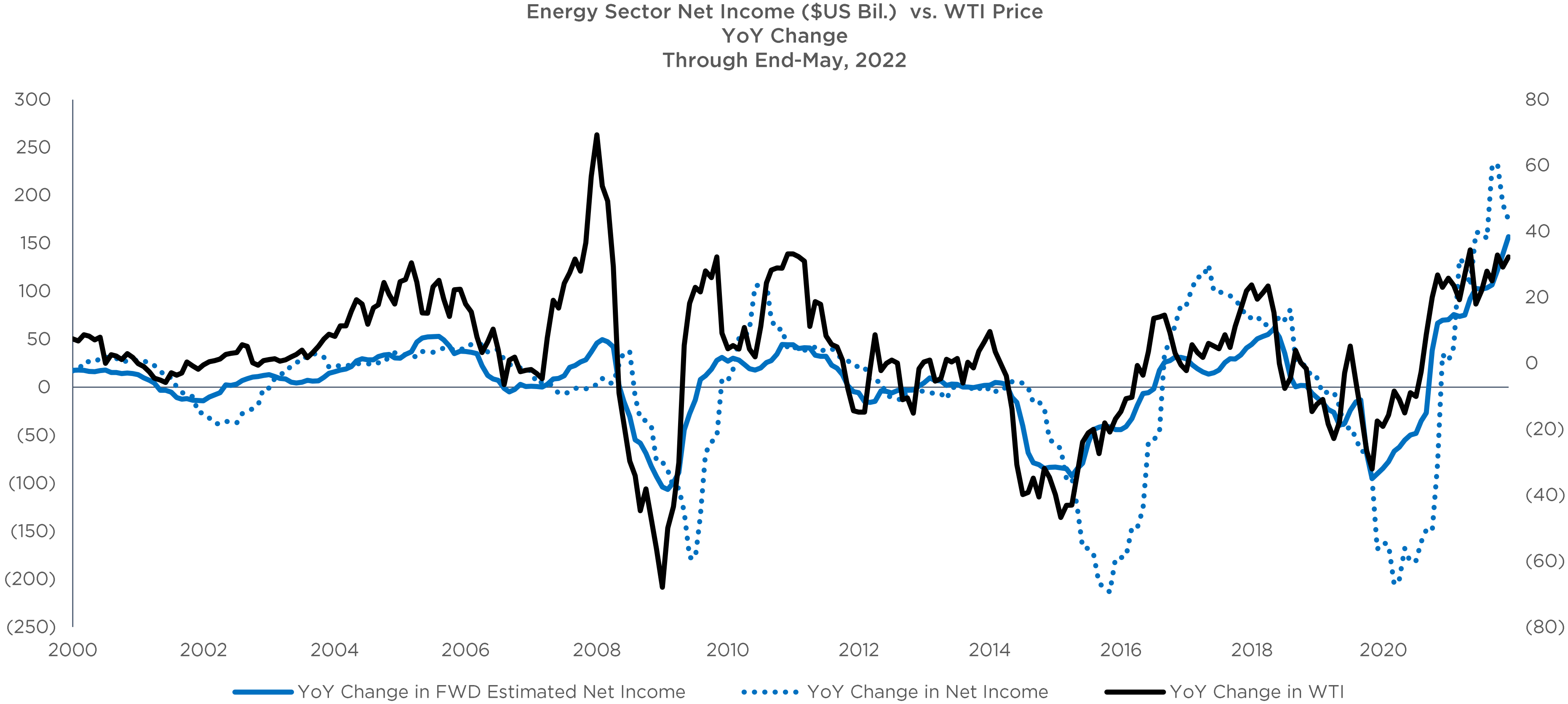
THERE IS A LAG BETWEEN OIL PRICES, ESTIMATES, AND REPORTS

For energy, oil prices are a leading indicator for net income of the energy sector. The black line below shows the change in WTI , which is typically a 3-to-6-month leading indicator for the dashed blue line, which is reported net income. The analysts typically wait until after oil lags (solid blue line), but right before the companies report earnings, so their forecasts are not particularly anticipatory.



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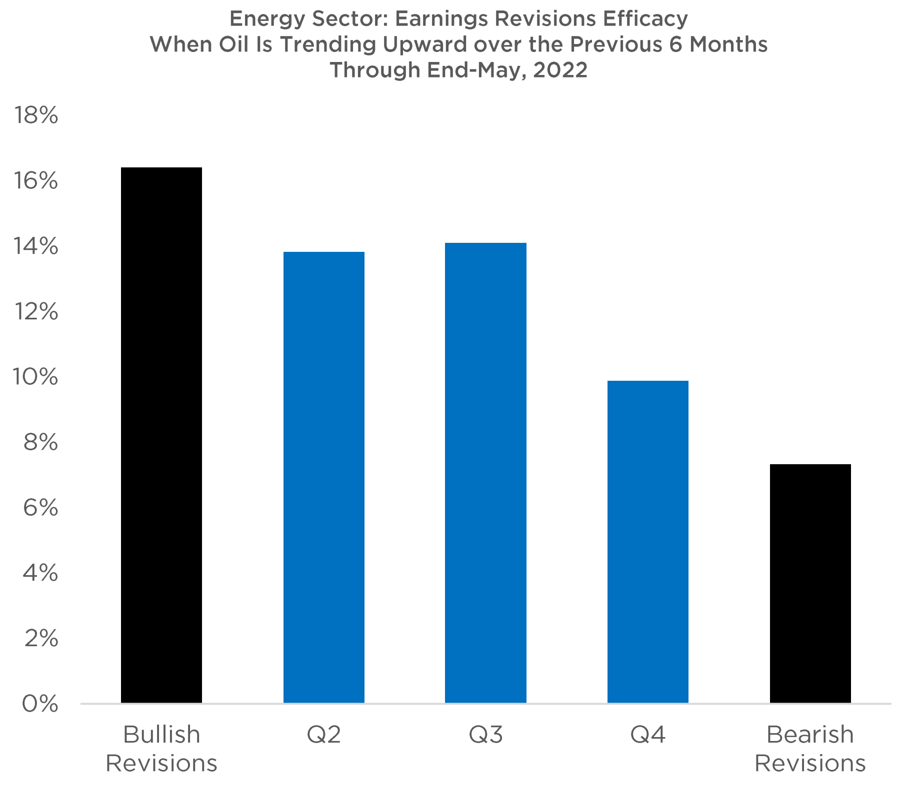
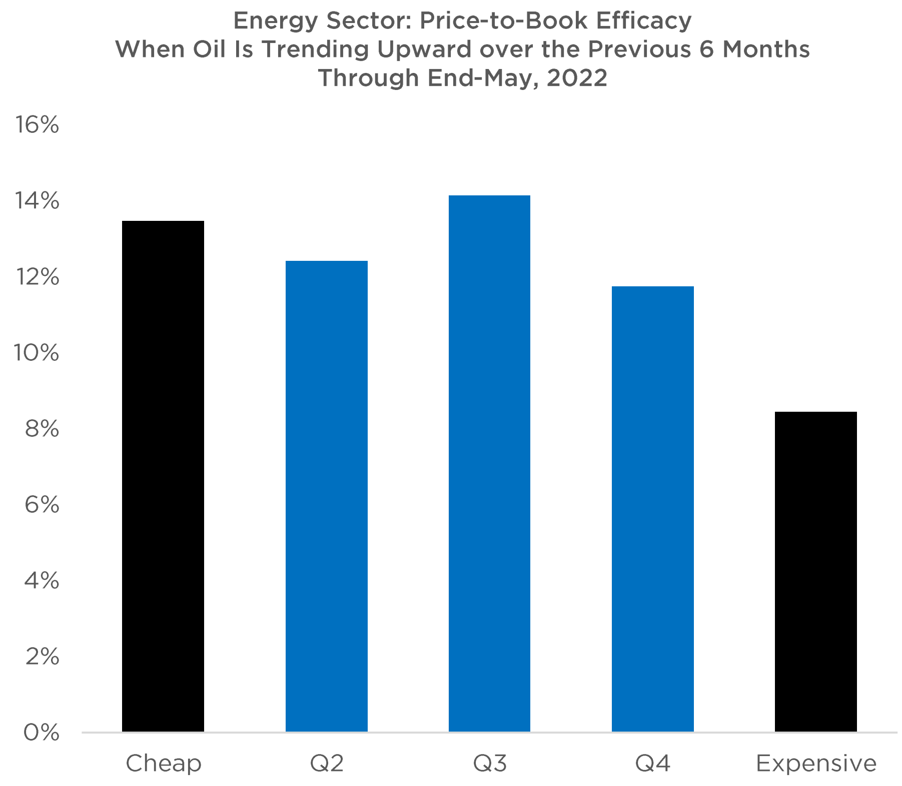
USE ENERGY EARNINGS REVISIONS & VALUATION WHEN OIL IS RISING

We analyzed whether earnings revisions were efficacious at predicting subsequent energy sector returns when oil is rising. Given that stock prices are typically anticipatory, we have received several questions about how much more energy stocks could rally. During a rising oil regime, analyst earnings revisions have historically been a highly effective signal, with the top quintile on revisions beating the bottom by ~7% during the average subsequent 6-month period. While for the broader market we do not necessarily anticipate valuation metrics to work particularly well, valuation has also worked, with the cheapest quintile on price-to-book outperforming the most expensive by ~5%.





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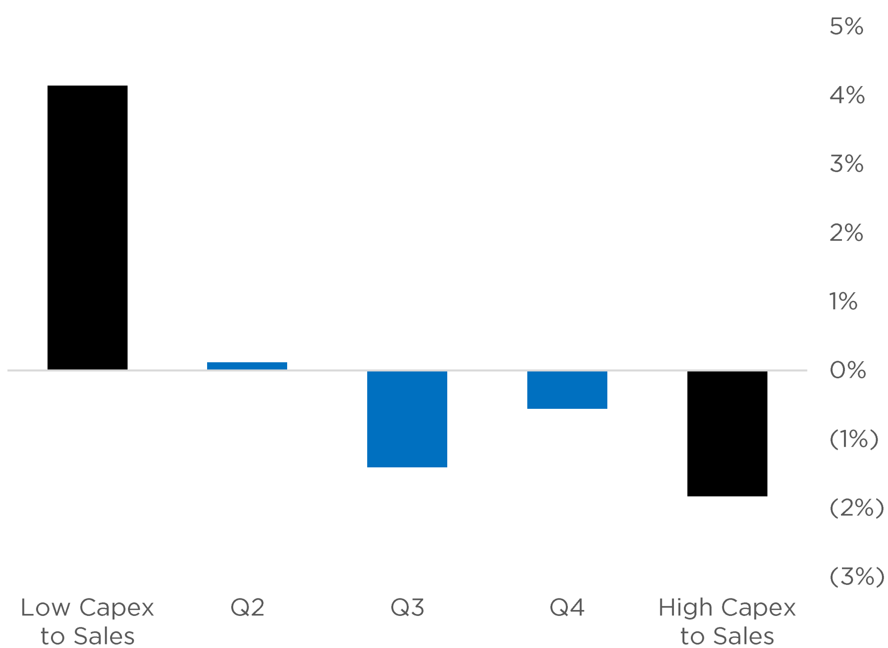
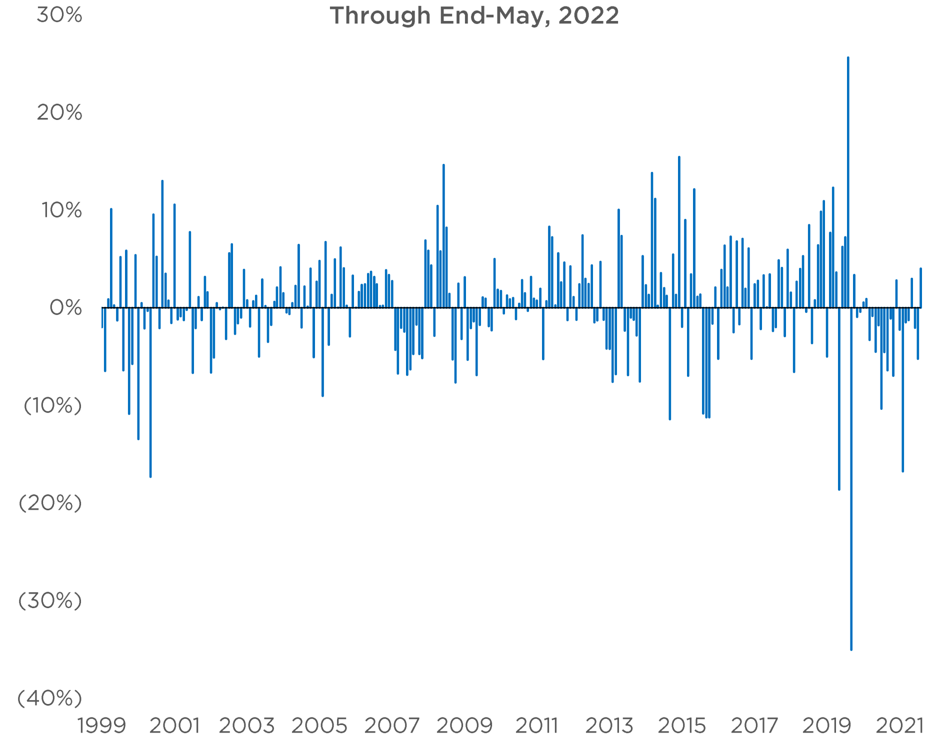
HISTORICALLY CAPITAL INTENSITY WAS BAD IN ENERGY, BUT NOT NOW

Within the energy sector, over the last 20 years (left) less capital-intensive companies outperformed their peers, by 6% per annum on average. In fact, many investors mocked the “cowboy” like approach energy CEOs had towards spending. However, the most capital-intensive energy stocks have outperformed the least capital intensive in 15 of the last 18 quarters (right). Given the supply-demand imbalances in oil, we expect increased capital intensity and oil sensitive stocks to continue to perform well for the foreseeable future.

Energy Sector
Median Performance by Capital Spending-to-Sales Quintile
Industry Group-Adjusted Returns, Since 1999



Energy Sector
Capital Spending-to-Sales Factor Efficacy (Q1-Q5 Spread)
Through End-May, 2022



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THERE IS SKEPTICISM OF THE SUSTAINABILITY OF MATERIALS PROFITS

The consensus expectations are that net margins for the materials sector will achieve record highs, and then dramatically roll-over, yet the valuation on a relative to the market basis has barely moved above 18-year lows. Our belief is that many of the companies structurally improved cycle to cycle, so while they clearly are over-earning today, there has been substantive balance sheet repair. We like the risk-reward of a sector with high but likely achievable near-term estimates and attractive relative valuation.

Materials Sector
Forecasted Net Margins
Through End-May, 2022

Materials Relative to T3000 ex-Materials
Median Price-to-Forward Earnings
Through End-May, 2022

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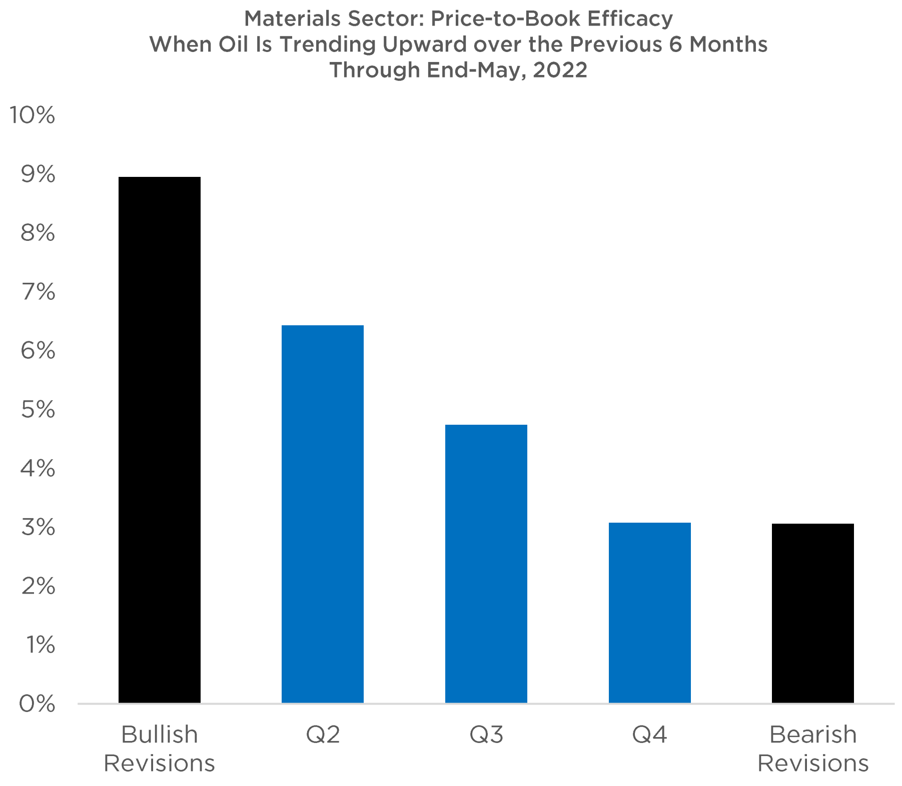
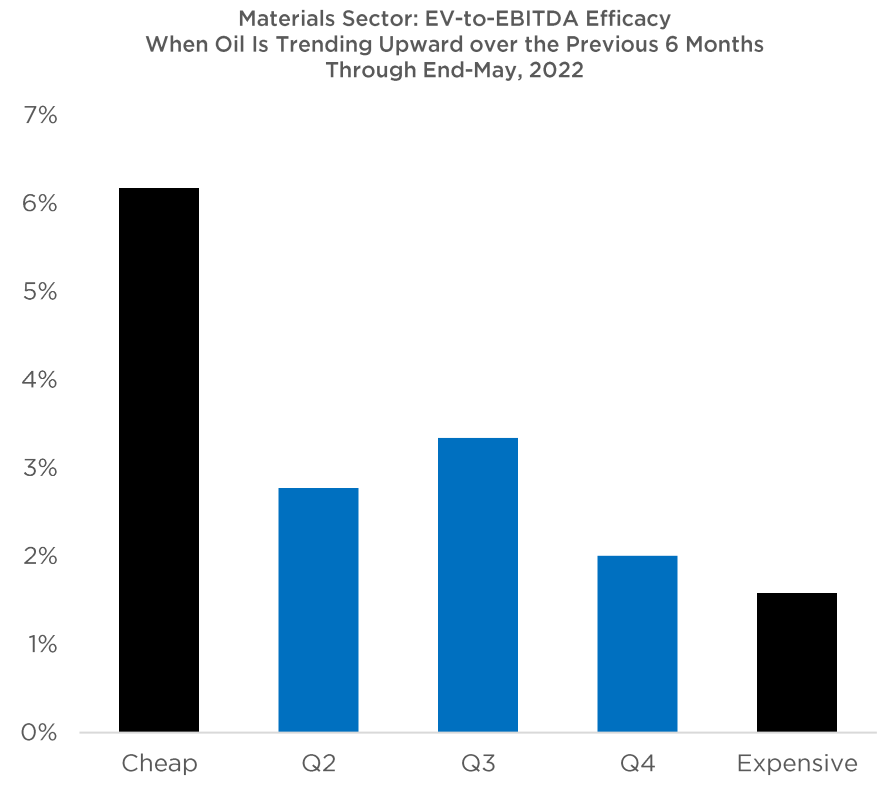
EARNINGS REVISIONS & VALUATION WORK FOR MATERIALS STOCKS

As was the case in energy, materials stocks with upward analyst earnings revisions and cheaper valuation outperform those with less upward or downward revisions as oil and commodity prices rise. The top vs. bottom quintile spreads on earnings revisions average 6% on average over the subsequent six months following rising revisions, and the cheapest quintile on EV-to-EBITDA outperforms the most expensive by 7% on average.





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ENERGY AND MATERIALS STOCKS WE THINK OUTPERFORM

Tying it together, we are bullish on energy and materials given the combination of estimate achievability and valuation. The below screen shows stocks that are in the energy and materials sector and are in the top 25% of both valuation and earnings revisions today

Energy and Materials Sector
Top Quartile in Estimate Revisions and Valuation
End-May, 2022

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
FCX	Freeport-McMoRan Inc.	Metals & Mining	56.64
DOW	Dow Inc.	Chemicals	49.50
LYB	LyondellBasell Industries N.V.	Chemicals	37.43
NUE	Nucor Corporation	Metals & Mining	35.24
MOS	The Mosaic Company	Chemicals	22.68
CF	CF Industries Holdings, Inc.	Chemicals	20.6
WLK	Westlake Corporation	Chemicals	16.95
STLD	Steel Dynamics, Inc.	Metals & Mining	16.11
CLF	Cleveland-Cliffs Inc.	Metals & Mining	12.16
RS	Reliance Steel & Aluminum Co.	Metals & Mining	12.04
AA	Alcoa Corporation	Metals & Mining	11.38
OLN	Olin Corporation	Chemicals	9.99
X	United States Steel Corporation	Metals & Mining	6.53
CIVI	Civitas Resources, Inc.	Oil, Gas & Consumable Fuels	6.49
LPX	Louisiana-Pacific Corporation	Paper & Forest Products	5.67
CMC	Commercial Metals Company	Metals & Mining	4.83
AMR	Alpha Metallurgical Resources, Inc.	Metals & Mining	3.03
TROX	Tronox Holdings plc	Chemicals	2.81
GLNG	Golar LNG Limited	Oil, Gas & Consumable Fuels	2.74
CDEV	Centennial Resource Development, Inc.	Oil, Gas & Consumable Fuels	2.26
STNG	Scorpio Tankers Inc.	Oil, Gas & Consumable Fuels	1.86
WTTR	Select Energy Services, Inc.	Energy Equipment & Services	0.83

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OPPORTUNITIES IN THE HEALTHCARE SECTOR

1. The biotechnology sell-off now appears too extreme, with forecasted sales growth relatively strong and relative price-to-sales multiples now at multi-year lows. Adding exposure to biotechnology appears to be good risk-reward. Even if rising interest rates hurt terminal value assumptions, multi-year lows on sales seem overly punitive in our judgment.

2. Healthcare providers and services companies remain the cheapest industry within healthcare, with relative multiple contraction over the last five years, while all the other healthcare industry groups experienced relative multiple expansion on price-to-forward earnings. Interestingly, this contraction happened despite higher revenue growth and lower volatility of the revenue growth. Our prior work shows these stocks can be interest rate sensitive, so investors looking for businesses with pricing power, good revenue growth, low volatility of growth, and compelling relative valuation should look at healthcare providers and services for opportunities.

3. The relationship between classic defensive sectors like mega / large cap. pharma / biotechnology and consumer staples has consistently evolved. The relative valuation of the group is now at all time lows, leaving mega /large biotech / pharma at 56% of the relative multiples when they used to trade at premiums, despite relatively good performance this year. The shareholder return is about constant (dividend plus repurchase yield), a potential sign of the attractiveness of pharma as a defensive play.

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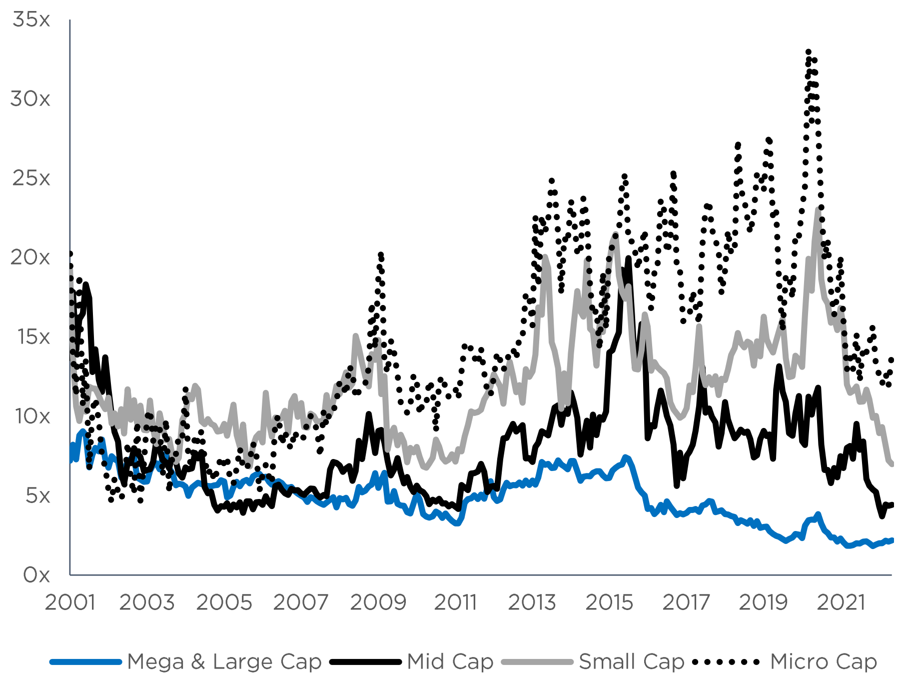
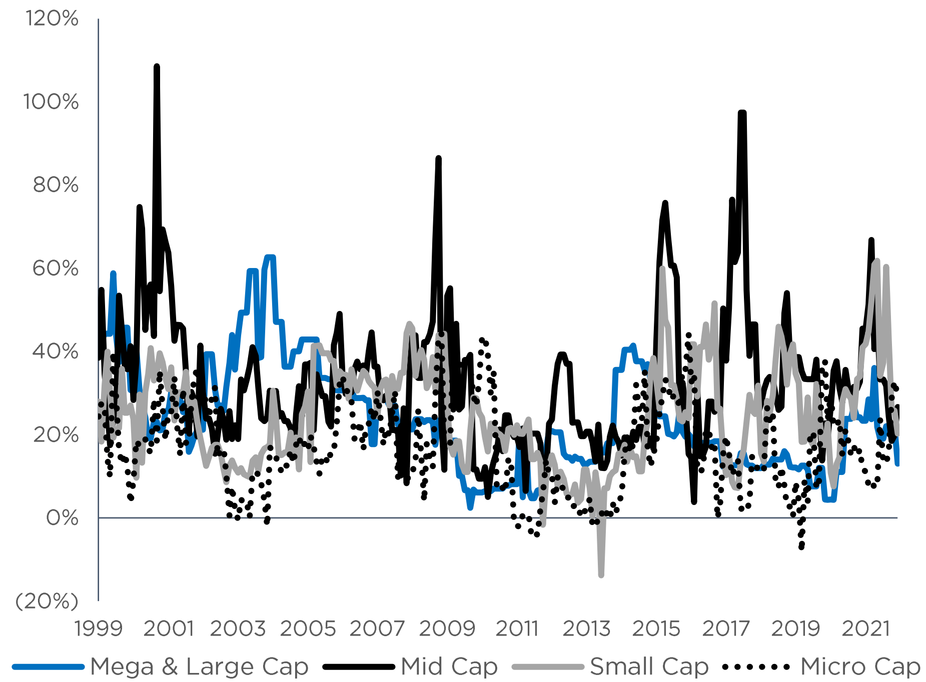
BIOTECHNOLOGY VALUATION VS. GROWTH OUTLOOK HAS CHANGED

The biotechnology sell-off now appears too extreme (left chart). Mega / large cap biotechnology stocks have never been cheaper, and mid-cap biotechnology stocks are at ten-year relative lows. Meanwhile, the revenue growth rates for companies remain close to the same as they were prior to the sell-off (right chart) implying that this valuation reset has been material. Our judgment is the risk-reward looks positive for biotechnology today, though we would likely hedge by shorting some other hyper growth stocks against this group.

Median Relative Price-to-Sales
Biotechnology to All Else (ex-Financials)
Through End-May, 2022



Median Year-over-Year Revenue Growth
Biotechnology
Through End-May, 2022



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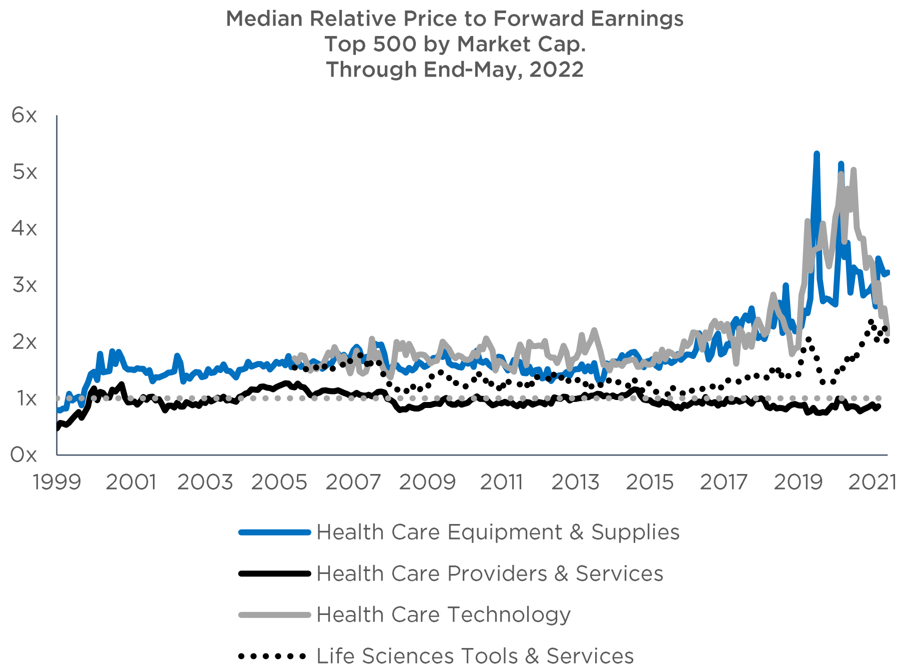
HEALTHCARE PROVIDERS AND SERVICES LOOK ATTRACTIVE

Healthcare providers and services companies remain the cheapest industry within healthcare, having seen relative multiple contraction over the last five years, while all the other healthcare industry groups experienced relative multiple expansion on price-to-forward earnings (left chart). Interestingly, this contraction happened despite comparable revenue growth (right chart), and lower volatility of the revenue growth. Gross margins contracted for the group this year, and cost pressures are an obvious concern. However, our prior work shows these stocks can be interest-rate sensitive, so investors looking for businesses with pricing power, good revenue growth, low volatility of growth, and compelling relative valuation should look at healthcare providers and services for opportunities.



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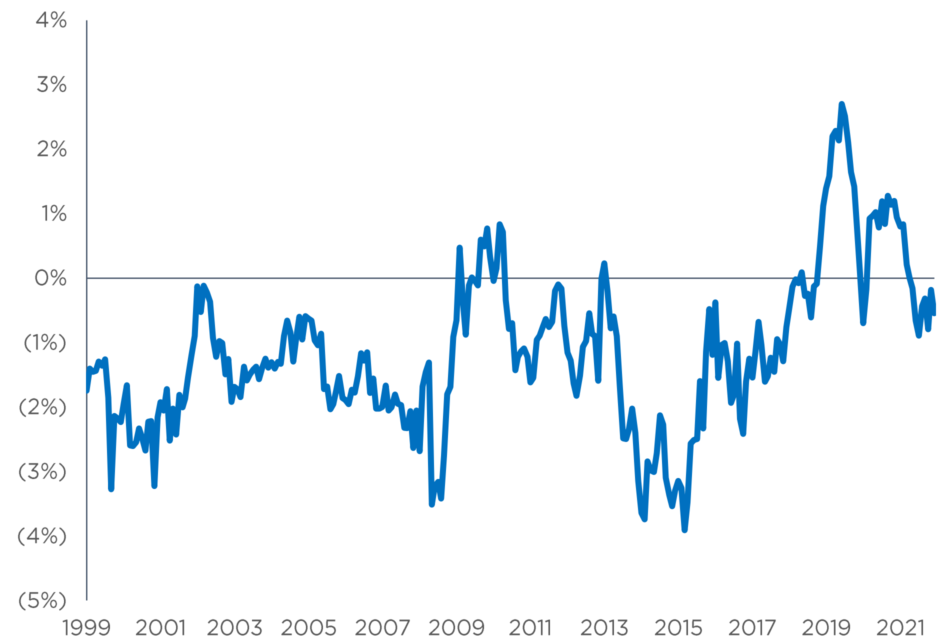
PHARMA SEEMS TOO CHEAP VS. CONSUMER STAPLES

The relationship between classic defensive sectors like mega / large cap. pharma / biotechnology and consumer staples has consistently evolved. The relative valuation of the group is now at all time lows (left chart), with staples ripping December of 2021 and leaving biotech / pharma at 56% of the relative multiples when they used to trade at premiums. The shareholder return is about constant (dividend plus repurchase yield), a potential sign of the attractiveness of pharma as a defensive play (right chart).

Median Relative Price to Forward Earnings
Mega & Large Cap. Pharma Biotech to Consumer Staples
Through End-May, 2022

Median Relative Total Indicated Yield
Mega & Large Cap. Pharma Biotech to Consumer Staples
Through End-May, 2022



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UTILITIES - SUMMARY AND CONCLUSIONS

Over three-quarters of all utility companies have negative free cash flow today - up from only one-third a decade ago. There is now a meaningful disconnect between earnings and cash flow, and **this dynamic typically points toward more efficacious shorts.**

Not only are there a huge number of utilities with negative free cash flow, but 20% of all utility stocks have dividends that are greater than their net income, which ultimately increases the probability of a dividend cut or cancellation. Utilities with payout ratios greater than 100% that also have negative free cash flow have historically meaningfully lagged. Despite the consistent underperformance of high payout ratio / negative FCF utilities, and the huge increases in the percentage of utilities with negative FCF, high debt levels, and dividend yields that are no longer attractive relative to US Treasuries - **the percentage of stocks that have high short interest is low relative to history, which we feel is evidence this space is under-examined by investors**. 58 of the 68 utilities we track currently have less than 4% short interest, and only 2 have above 10% short interest. **Slide 13 shows current short ideas,** all of which have high payout ratios, bad credit ratings, and relatively low short interest.

Dividend expanders with ample ability to pay their dividend are more expensive in the utilities sector than in other parts of the market, with record high relative price-to-forward earnings multiples – however, there are some exceptions that may be good long ideas.

Criteria for our buy recommendations are stocks that are disfavored by the sell-side, have positive net income, reasonably low pay out ratios, bonds that are not poorly or downwardly rated, and are not crowded by a proprietary universe of hedge funds we track.

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UTE: LOW CORRELATION TO GROWTH STOCKS AND NOT CROWDED

From the portfolio construction and risk standpoint, the utilities sector generally has extremely low return correlation to the hyper growth universe, except during the depths of COVID when everything sold off (left). This means it like is a good place to hunt for differentiated return streams. We follow the high conviction (3% or more of long AuM) positions of 60 well-known fundamental equity hedge funds, and the only two utility stocks where more than one of these managers has high conviction is PCG and AES. **If you are looking for differentiated alpha, 66 of the 68 utilities (ex PCG) are not owned with conviction by the most active fundamental hedge funds.**

Utilities Sector vs. Hyper Growth Universe
Return Correlation
Through End-May, 2022

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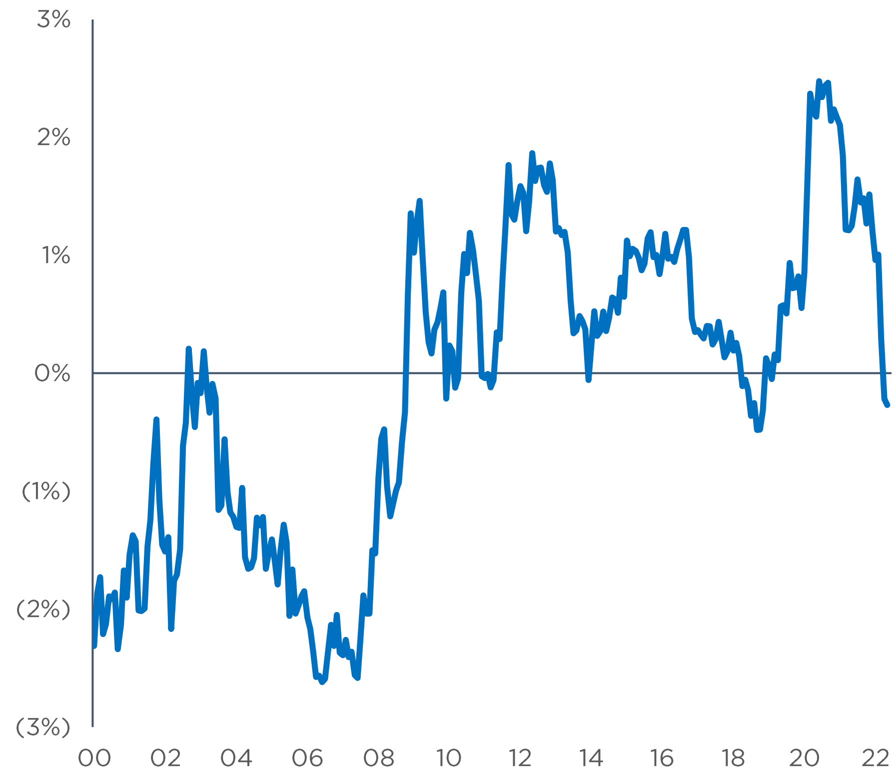
RELATIVE VALUATIONS NO LONGER COMPELLING

Given the flattish returns for the utilities sector this year in a tape with heavy negative returns, we noticed the relative price-to-forward earnings has now expanded to about just about parity to the broader market (left). In aggregate, this doesn't seem unreasonable to us given that estimate achievability is a chief concern in risk-off regimes, and utilities' relative estimate achievability should be above average. However, we now know there is no "relative yield" argument, as the median utility stock has the same dividend yield as the 10-year yield, and many think of utilities as bond-like stocks.

Utilities Relative to SP500 Cap-Weighted
Price-to-Forward Earnings
Through End-May, 2022

Utility Sector Median Stock
Dividend Yield Minus US 10-Year Treasury
Through End-May, 2022



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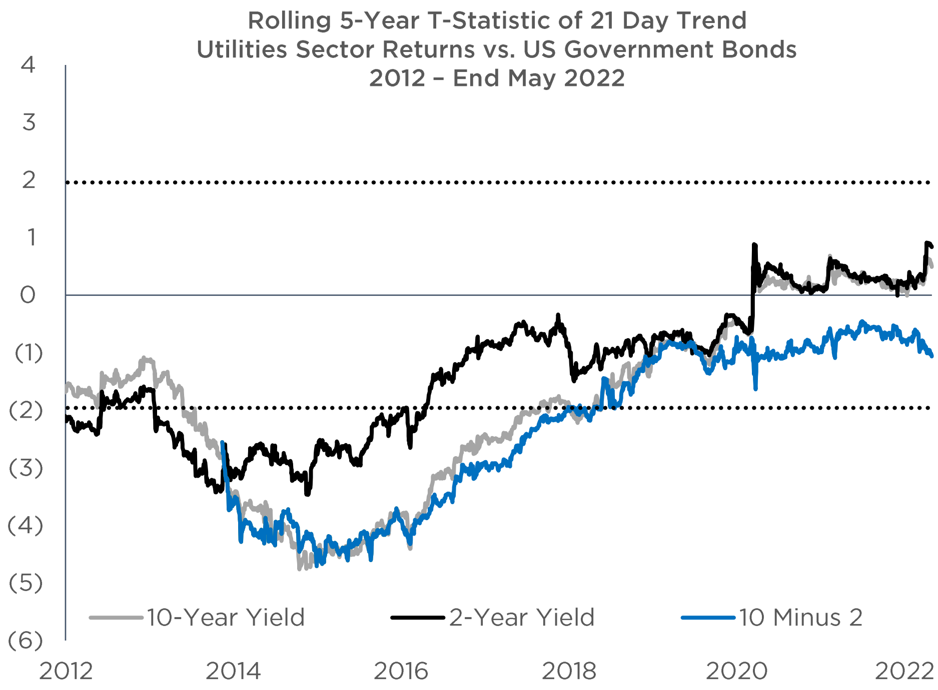
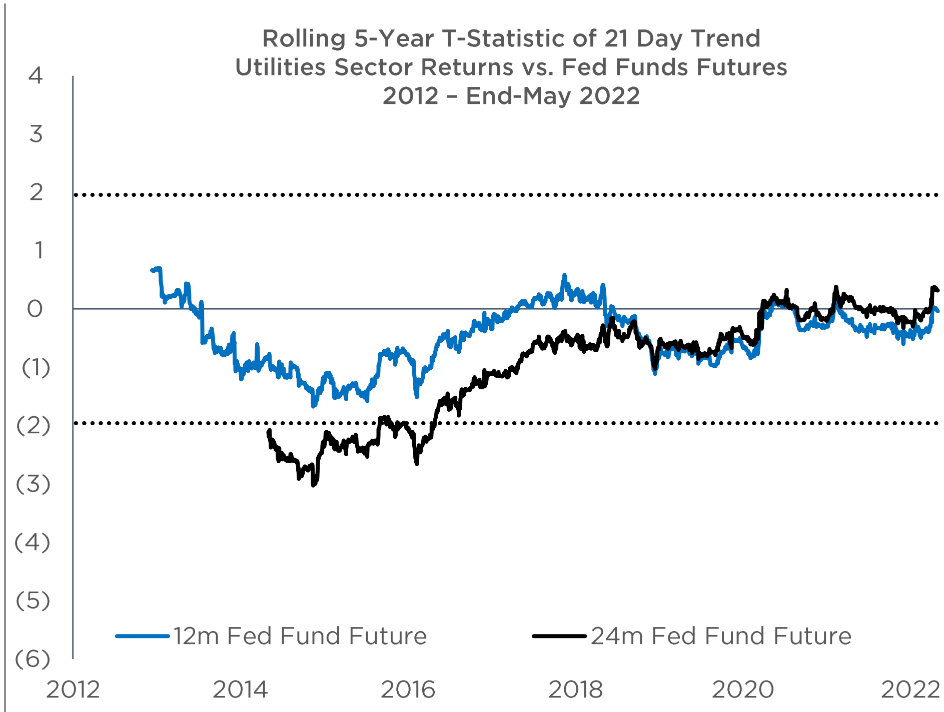
LESS RATE SENSITIVE NOW THAN THEY USED TO BE?

In addition to the parity of level of utilities to bond yields, **the relationship of utilities to bond yields has changed.** The utilities sector was historically negatively correlated to the slope and level of the US government bond yields - the relationship was strongly negatively statistically significant from 2010-2017 (left chart). But that relationship broke down four years ago and in Q1 of this year, utilities performed well even as bond yields rose – a counter-trend relationship. Over the past six months, we have been focused on the impact of perception of changes to interest rates – or the Fed Fund Futures – and there has been near zero correlation between utility sector performance and changes to perceptions about interest rates over the past several years (right), so the group should not be strongly affected by directionally dovish or hawkish commentary.





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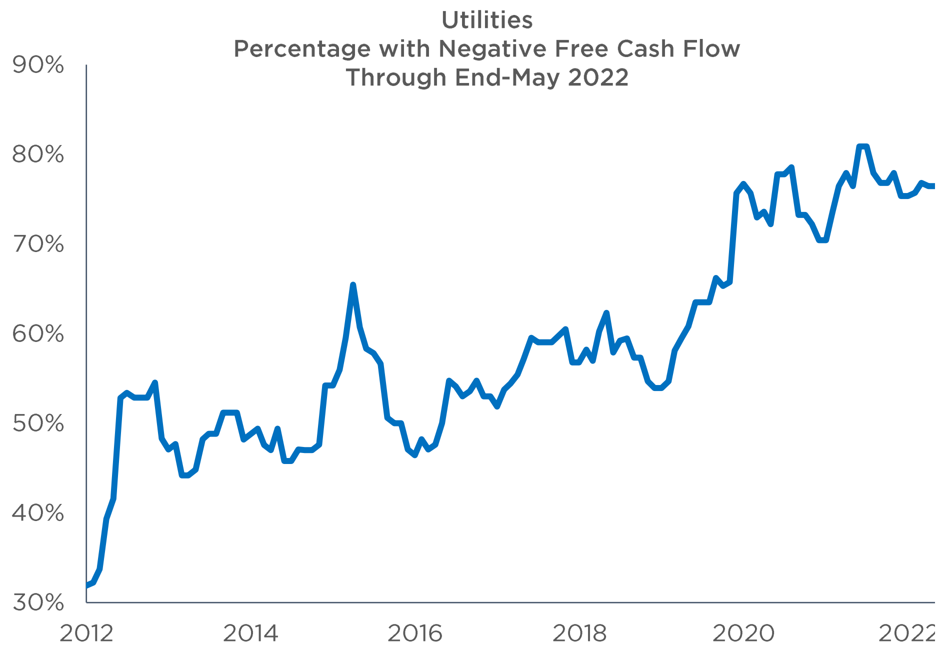
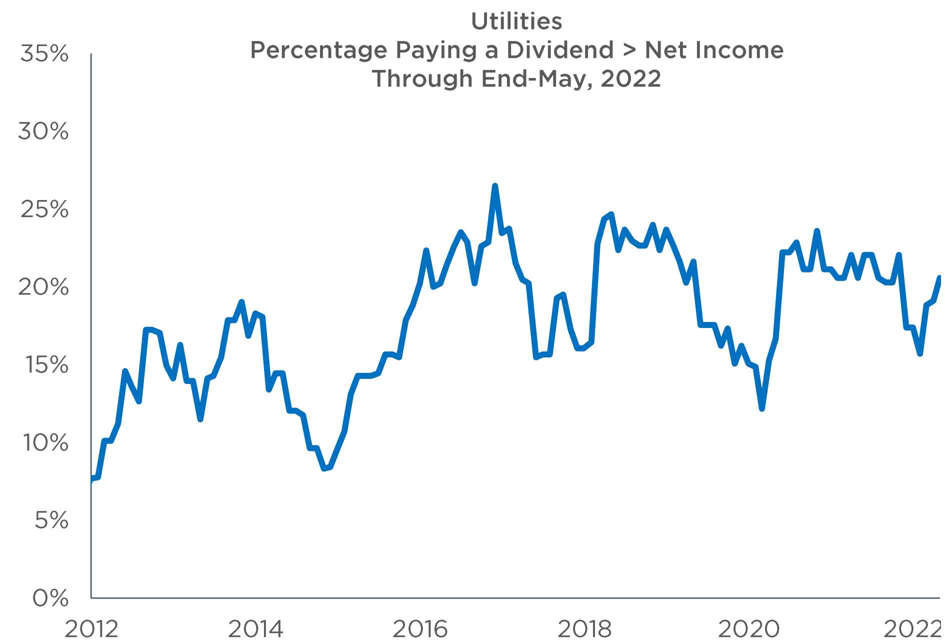
MOST UTILITIES HAVE NEGATIVE FREE CASH FLOW

Even if the relationship with interest rates remains perverse, underlying fundamentals appear to have evolved. Utilities now have meaningful disconnects between earnings and cash flow. **In fact, over three-quarters of all the utilities companies have negative free cash flow today (left), up from only one-third a decade ago. This makes us excited there are some short ideas in the sector!** Not only are there a huge number of utilities with negative free cash flow, but also 20% of them have dividends that are greater than their net income (right), which ultimately increases the probability of a dividend cut or cancellation. Our prior work shows these stocks strongly underperform in a rising rate environment.





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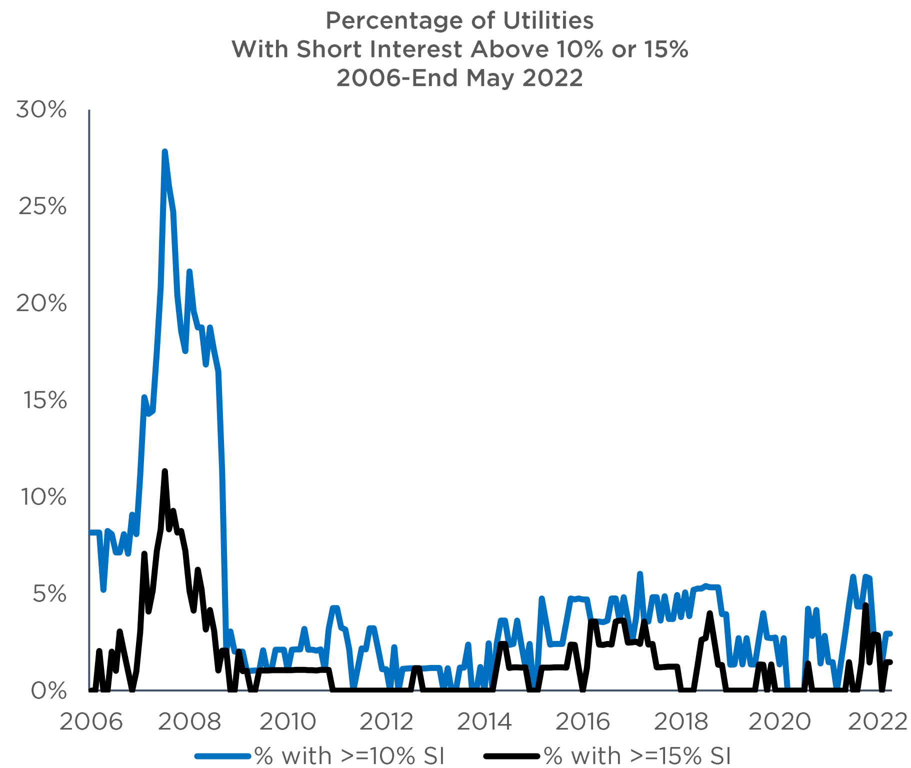
WE CAN FIND UNDERPERFORMERS WITH LOW SHORT INTEREST

We have identified a group of utilities that have performed quite poorly over the last two decades – those with payout ratios greater than 100% that also have negative free cash flow (left). Despite the consistency of this underperformance, and the huge increases in the percentage of stocks with negative free cash flow, high debt levels, and dividend yields that are no longer attractive relative to US Treasuries, the percentage of stocks that have high short interest is low (right). 58 of the 68 utilities we track currently have less than 4% short interest, and only 2 stocks have above 10% short interest (NOVA, and MIC, a microcap holding company with a recent large transaction).



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POTENTIAL SHORT IDEAS IN UTILITIES

Utility stocks that have dividends above their net income, have below investment grade credit, have negative or very low free cash flow, and still have low short interest are shown below.

Select Quantitatively Derived Utilities Shorts
Through End-May 2022

Ticker	Company Name	S&P LT Local Issuer Bond Rating	Short Interest to Floatcap	Price-to-Forward-Earnings	Market Cap ($ US. Bil)
SO	The Southern Company	BBB+	1.4%	21.31x	80.39
SRE	Sempra	BBB+	1.3%	19.19x	51.50
PEG	Public Service Enterprise Group Incorporated	BBB+	1.5%	19.70x	34.22
EIX	Edison International	BBB	1.3%	15.37x	26.65
DTE	DTE Energy Company	BBB+	1.4%	22.25x	25.71
AES	The AES Corporation	BBB-	1.5%	13.63x	14.72
VST	Vistra Corp.	BB	3.0%	11.54x	11.39
SJI	South Jersey Industries, Inc.	BBB*-	5.0%	20.50x	4.26

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BUY IDEAS IN UTILITIES – EXPANDING DIVIDENDS AND ABILITY TO PAY

Several data points lead us to conclude there are ample short ideas in the utilities sector. To offset that, we searched for long ideas in case a defense tape persists. Our prior work shows companies that can consistently expand their dividends do well in rising rate environments, so we compared the valuation of the dividend expanders with positive net income and reasonably low payout ratios (less than 66%) to those same stocks not in the utilities sector. Utilities with these attributes are at all time highs (left). Buy ideas (right) are utilities that the sell-side is biased against, have positive net income, reasonably low payout ratios, and bonds that are not poorly or downwardly rated (right).

Price-to-Forward-Earnings
Utilities vs. Non-Utilities Dividend Expanders
Through End-May, 2022

Select Quantitatively Derived Utilities Longs Through End-May 2022

Ticker	Company Name	S&P LT Local Issuer Bond Rating	Short Interest/ Floatcap	Price-to-Forward-Earnings	Market Cap ($ US. Bil)
CMS	CMS Energy Corporation	BBB+	1.6%	24.67x	20.61
AWK	American Water Works Company, Inc.	A	1.1%	33.91x	27.49
NRG	NRG Energy, Inc.	BB+	6.7%	11.79x	10.92
SR	Spire Inc.	A-	4.8%	19.07x	4.08
PNM	PNM Resources, Inc.	PNM	6.0%	18.58x	4.08
CWT	California Water Service Group	A+	2.0%	29.01x	2.89
OTTR	Otter Tail Corporation	BBB	1.1%	12.28x	2.72
MSEX	Middlesex Water Company	A	5.7%	31.89x	1.49

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CONSUMER RESEARCH AND CONCLUSIONS

- **Last hiking cycle:** We analyzed the consumer sub-industries returns following the last initial rate hike in December of 2015. Household and personal products and food, beverages and tobacco performed well, whereas autos and retailers were weak. Interestingly, that is the identical industry performance scorecard to what typically works when our consumer activity gauge is strong.
- **Consumer discretionary:** Growth stocks look expensive, as there are more profitless discretionary stocks now than anytime in the last 20 years. Value stocks are trading near all-time lows on price-to-forward earnings. Junk stocks have seen some margin expansion but valuation multiples remain low, signaling relative opportunity in our judgment.
- **Consumer staples:** Growth stocks remain incredibly expensive, and value stocks are average vs. history on price-to-forward earnings. The profitability gap has widened between high quality and junk, but the multiples have not – indicating junk stocks could be good candidate for relative multiple contraction. Small / micro caps look particularly expensive relative to mega / large given current margin levels.
- **Consumer long ideas:** Longs include junk and value discretionary that are cheap on price-to-forward earnings and are forecasted to have margin expansion and revenue growth. Value staples with above 3% forecasted revenue growth are also attractive.
- **Consumer short ideas :** Expensive junk staples with low forecasted growth, expensive growth staples where multiple have not been reset, and growth discretionary where forecasted sales is less than 10% YoY.

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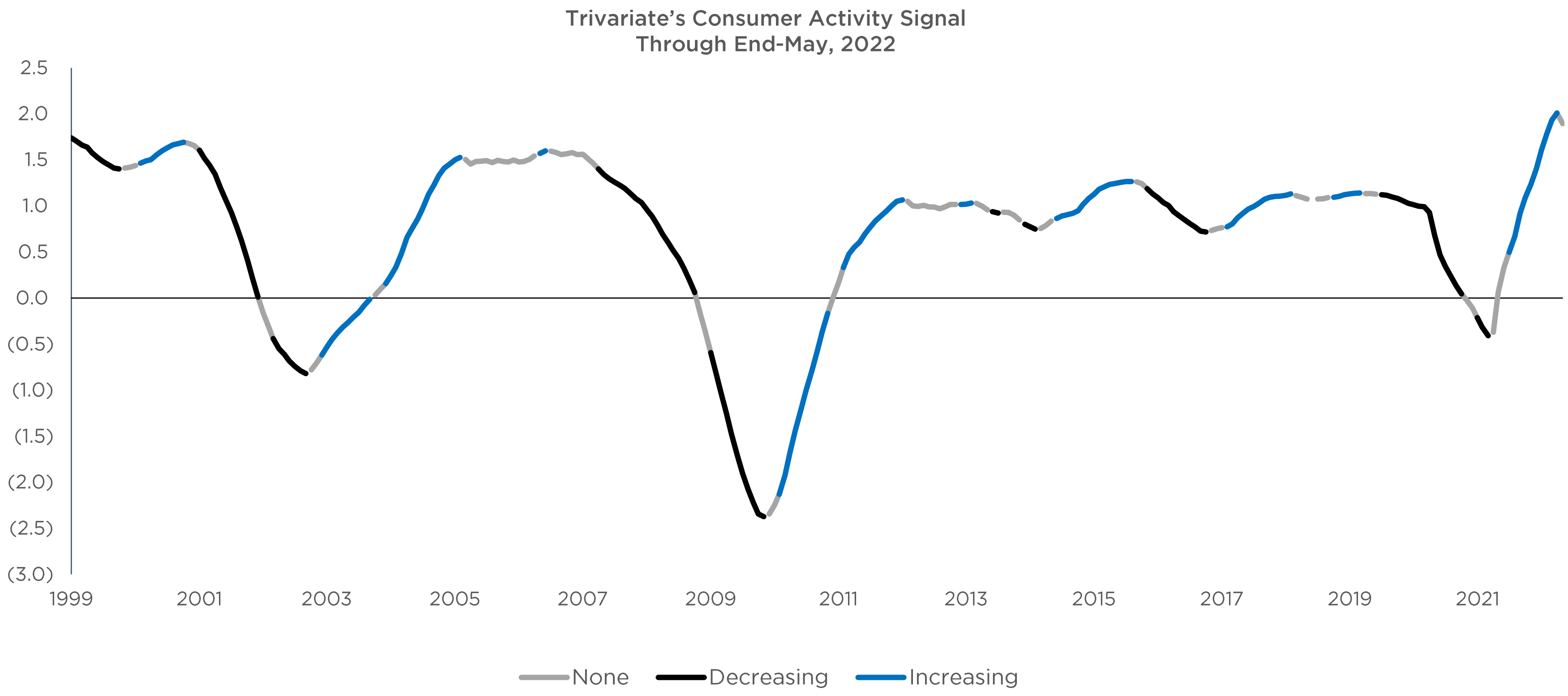
CONSUMER ACTIVITY HAS NOW PEAKED

We combined the labor, spending, expenses, and other consumer macro variables into our proprietary US consumer gauge. Below shows the consumer activity as quite robust now, with the key debate being whether it is near peaking. Our gauge would require materially softer labor and wage trends and weaker retail sales for this to be likely, and most corporates are facing the opposite challenge - labor shortages in the US. Analysts should focus on companies with a higher percentage of ex-US wages, as they are likely better positioned to handle this aspect of expenses. Overall, we think an increasing consumer activity gauge is likely for the next several months at a minimum.



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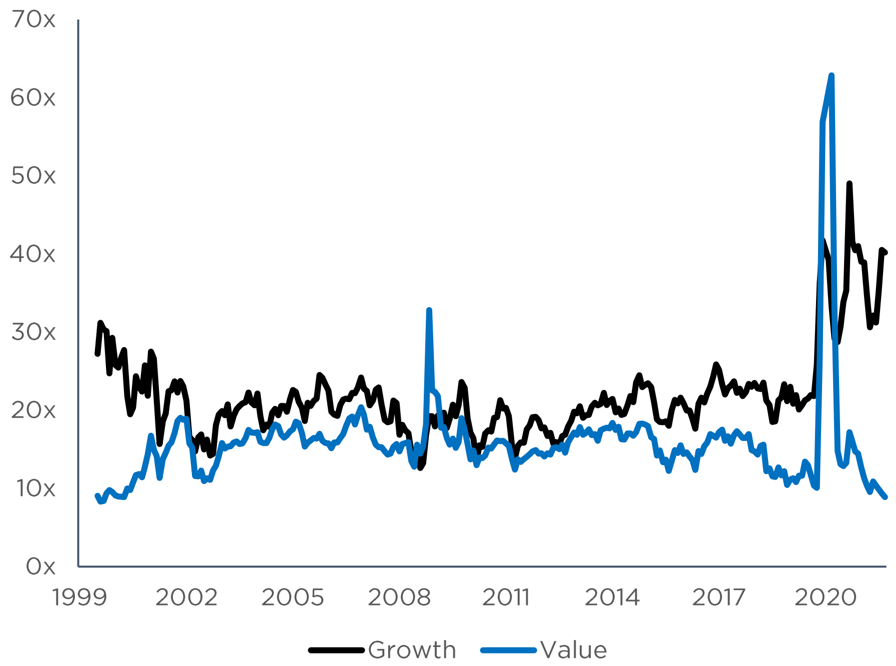
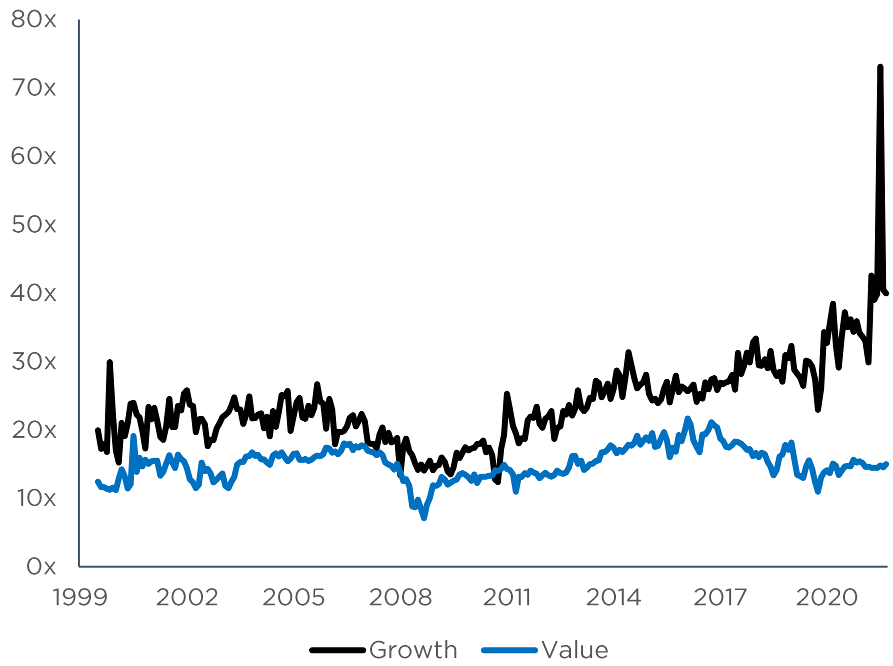
CONSUMER GROWTH STOCKS STILL EXPENSIVE, VALUE CHEAP

We broke down the consumer discretionary and staples sectors to see margin potential or valuation has been discounted differently than in the past. For discretionary (left) value stocks trade at historically low multiples, and the recent growth stock correction has not caused discretionary growth stocks to see multiples anywhere near historically average levels. For staples (right), price-to-forward earnings levels appear average, but like growth multiple remain quite high.

Consumer Discretionary
Median Price-to-Forward Earnings by Style
Through End-May, 2022



Consumer Staples
Median Price-to-Forward Earnings by Style
Through End-May, 2022



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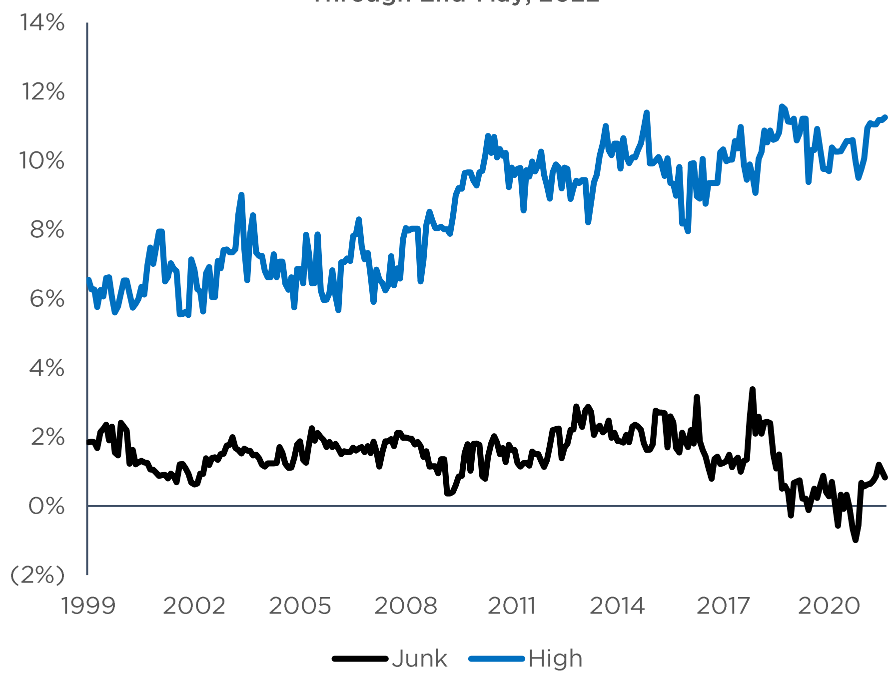
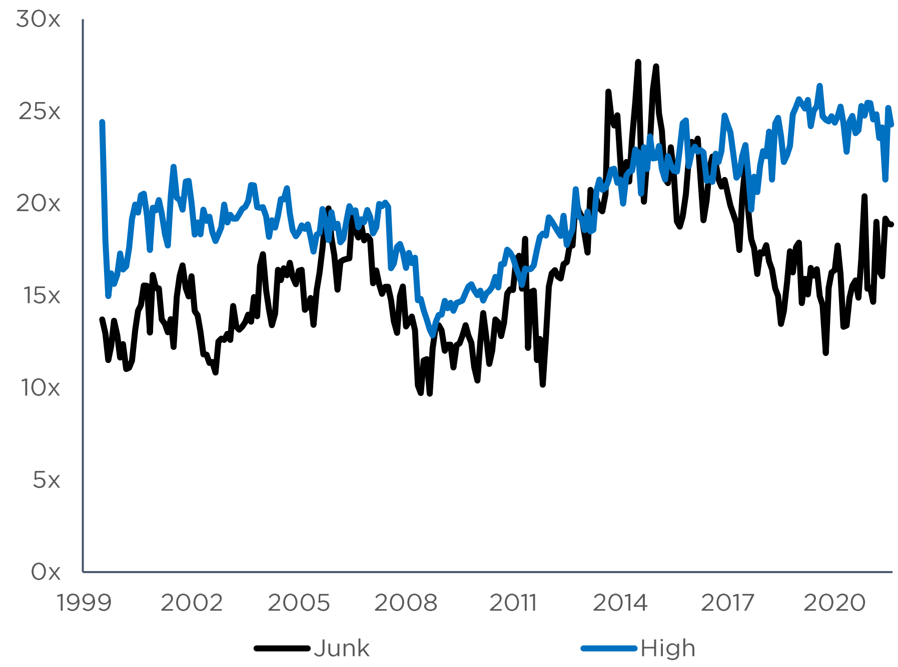
JUNK STAPLES STOCKS BARELY MAKE MONEY

The median "junk" consumer staples stock barely makes money (left), where as the quality staples have consistently expanded net margins over the last two decades. Despite this profitability gap, the specter of higher growth kept price-to-forward earnings levels close through history. It seems to us consumer staples junk stocks need to grow fast and expand margins to merit the narrow valuation disconnect to the highest quality bucket (right).

Consumer Staples
Median Net Margin by Substance Bucket
Through End-May, 2022



Consumer Staples
Median Price-to-Forward Earnings by Substance Bucket
Through End-May, 2022



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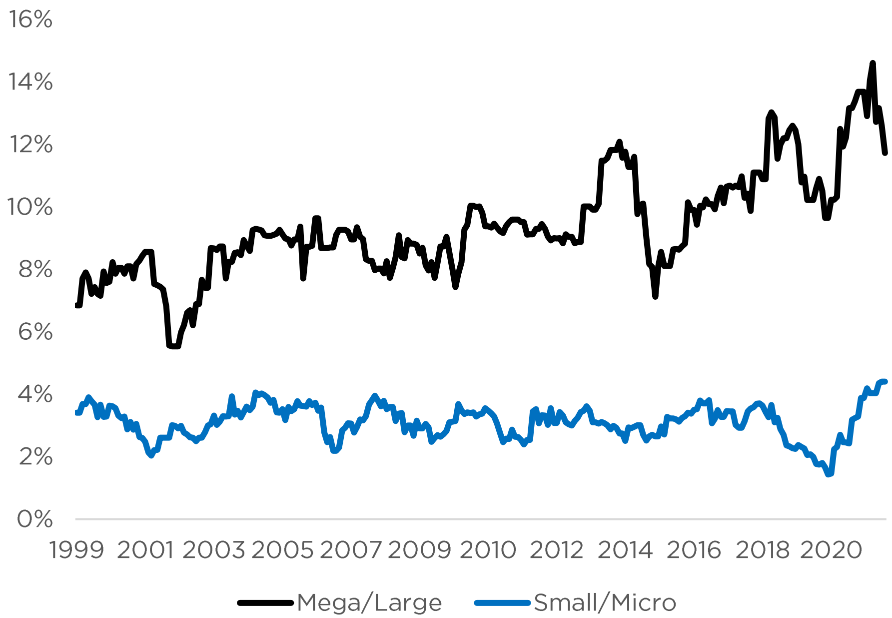
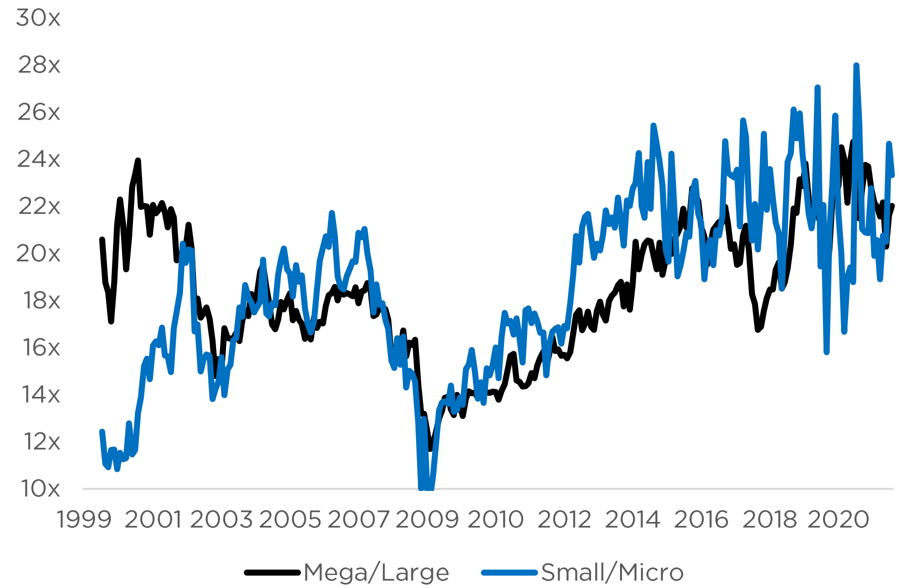
SMALL CAP STAPLES SEEM EXPENSIVE GIVEN CURRENT PROFITABILITY

Like the highest quality bucket, the profitability for the mega / large staples has also expanded over time (left). The profitability gap is substantial relative to the small / micro universe, though that group has seen steady expansion since COVID lows. Despite this, the price-to-forward earnings (right) for small /micro cap. staples is higher today than for the mega / large cap staples. We think this is overly generous, short of a fundamental story driving material revenue growth and margin expansion for small / micro cap. staples.

Consumer Staples
Net Margin by Size Bucket
Through End-May, 2022



Consumer Staples
Price-to-Forward Earnings by Size Bucket
Through End-May, 2022



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LONG IDEAS IN THE CONSUMER SPACE

Select Quantitatively Derived Consumer Longs
End-May, 2022

Ticker	Company Name	Sector	Industry Group	Market Cap ($ US. Bil)	Comment
PM	Philip Morris International Inc.	Consumer Staples	Food, Beverage & Tobacco	164.70	Value with above 3% rev. growth + margin expansion
MDLZ	Mondelez International, Inc.	Consumer Staples	Food, Beverage & Tobacco	87.96	Value with above 3% rev. growth + margin expansion
TJX	The TJX Companies, Inc.	Consumer Discretionary	Retailing	74.48	Junk with margin expansion and revenue growth
HRL	Hormel Foods Corporation	Consumer Staples	Food, Beverage & Tobacco	26.53	Value with above 3% rev. growth + margin expansion
BG	Bunge Limited	Consumer Staples	Food, Beverage & Tobacco	17.95	Value with above 3% rev. growth + margin expansion
KMX	CarMax, Inc.	Consumer Discretionary	Retailing	15.90	Junk with margin expansion and revenue growth
CAG	Conagra Brands, Inc.	Consumer Staples	Food, Beverage & Tobacco	15.78	Value with above 3% rev. growth + margin expansion
DRI	Darden Restaurants, Inc.	Consumer Discretionary	Consumer Services	15.59	Junk with margin expansion and revenue growth
MGM	MGM Resorts International	Consumer Discretionary	Consumer Services	14.90	Junk with margin expansion and revenue growth
HAS	Hasbro, Inc.	Consumer Discretionary	Consumer Durables & Apparel	12.51	Junk with margin expansion and revenue growth
ARMK	Aramark	Consumer Discretionary	Consumer Services	8.87	Junk with margin expansion and revenue growth
INGR	Ingredion Incorporated	Consumer Staples	Food, Beverage & Tobacco	6.27	Value with above 3% rev. growth + margin expansion
TNL	Travel + Leisure Co.	Consumer Discretionary	Consumer Services	4.36	Cheap Value with forecasted revenue growth
AEO	American Eagle Outfitters, Inc.	Consumer Discretionary	Retailing	2.04	Cheap Value with forecasted revenue growth
EPC	Edgewell Personal Care Co	Consumer Staples	Household & Personal Products	1.92	Value with above 3% rev. growth + margin expansion

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SHORT IDEAS IN THE CONSUMER SPACE

Select Quantitatively Derived Consumer Shorts
End-May, 2022

Ticker	Company Name	Sector	Industry Group	Market Cap ($ US. Bil)	Comment
ULTA	Ulta Beauty, Inc.	Consumer Discretionary	Retailing	21.92	> 20x PEF or neg. earning + grows rev. less than 10%
CLX	The Clorox Company	Consumer Staples	Household & Personal Products	17.89	Expensive Junk with Low Revenue Growth
BURL	Burlington Stores, Inc.	Consumer Discretionary	Retailing	11.06	> 20x PEF or neg. earning + grows rev. less than 10%
GME	GameStop Corp.	Consumer Discretionary	Retailing	9.48	> 20x PEF or neg. earning + grows rev. less than 10%
CHDN	Churchill Downs Incorporated	Consumer Discretionary	Consumer Services	7.56	> 20x PEF or neg. earning + grows rev. less than 10%
W	Wayfair Inc.	Consumer Discretionary	Retailing	6.25	> 20x PEF or neg. earning + grows rev. less than 10%
SMPL	The Simply Good Foods Company	Consumer Staples	Food, Beverage & Tobacco	4.01	Expensive growth
SKIN	The Beauty Health Company	Consumer Staples	Household & Personal Products	2.15	Expensive growth
MED	Medifast, Inc.	Consumer Staples	Household & Personal Products	1.91	Expensive growth
CRCT	Cricut, Inc.	Consumer Discretionary	Consumer Durables & Apparel	1.81	> 20x PEF or neg. earning + grows rev. less than 10%
BGS	B&G Foods, Inc.	Consumer Staples	Food, Beverage & Tobacco	1.56	Expensive Junk with Low Revenue Growth
ELF	e.l.f. Beauty, Inc.	Consumer Staples	Household & Personal Products	1.39	Expensive growth
SPTN	SpartanNash Company	Consumer Staples	Food & Staples Retailing	1.24	Expensive Junk with Low Revenue Growth
SFIX	Stitch Fix, Inc.	Consumer Discretionary	Retailing	0.92	> 20x PEF or neg. earning + grows rev. less than 10%
LOCL	Local Bounti Corporation	Consumer Staples	Food, Beverage & Tobacco	0.51	Expensive growth
VITL	Vital Farms, Inc.	Consumer Staples	Food, Beverage & Tobacco	0.40	Expensive growth
RAD	Rite Aid Corporation	Consumer Staples	Food & Staples Retailing	0.31	Expensive Junk with Low Revenue Growth

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CONTROVERSIES AND VARIABLES TO MONITOR FOR BANKS

We took a detailed look at the banks sector and research key investment controversies facing bank stock investors and three data points to monitor. We think these concepts apply broadly to investors in other industries as well. The controversies are:

1. **Gross Exposure:** Our quantitative models work better at discriminating banks stocks when financial conditions are loosening, however, financial conditions have tightened over the past couple of months are near 1-year lows. Average pairwise bank stock correlations are near all-time highs, company-specific risk for the banks is low and valuation dispersion has not seen a sustained increase in banks like it has in the broader market.
2. **Long-term vs. short-term valuation:** While banks remain relatively cheap vs. their own history on price-to-tangible book, multiples have expanded substantially more than actual book value has grown since the 10-year yield bottomed in August of 2020, meaning investors have been anticipatory of fundamentals.
3. **Growth vs. expenses:** While NIMs have expanded and loan growth is strong, expenses have materially risen. Our conclusion is that **large banks look more attractive than small**, with balance sheets that have improved more without a commensurate improvement in relative valuation particularly given their weakness in Q1. We would continue to monitor financial conditions, the savings rate, and loan growth as three key variables to see whether growth can improve for the group. Our judgment is to prefer the Big 8 banks to the broader universe of banks, as their improved income statements and balance sheets should command an increasing premium to the regionals.

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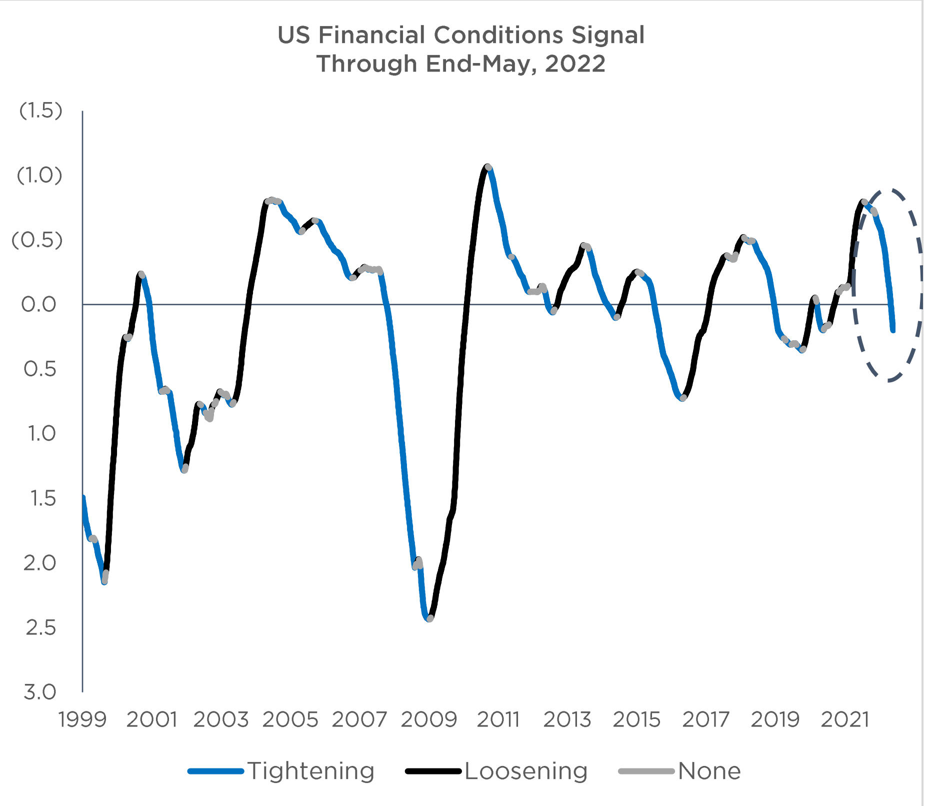
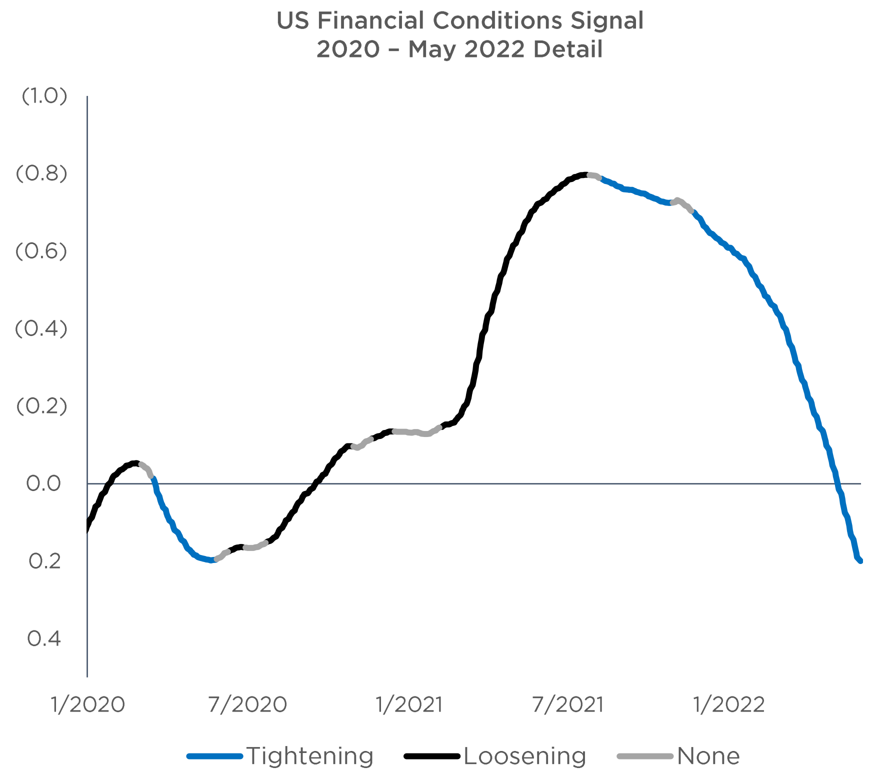
FINANCIAL CONDITIONS ARE TIGHTENING AGAIN

We evaluate financial conditions by combining credit spreads, mortgage rates, US Treasury volatility, the Bloomberg Financial Conditions Index, and other signals. We intentionally try to create a slower moving signal so that we are not over-reacting to shorter term moves in financial conditions. Today, conditions are tightening to levels last seen near the COVID lows.





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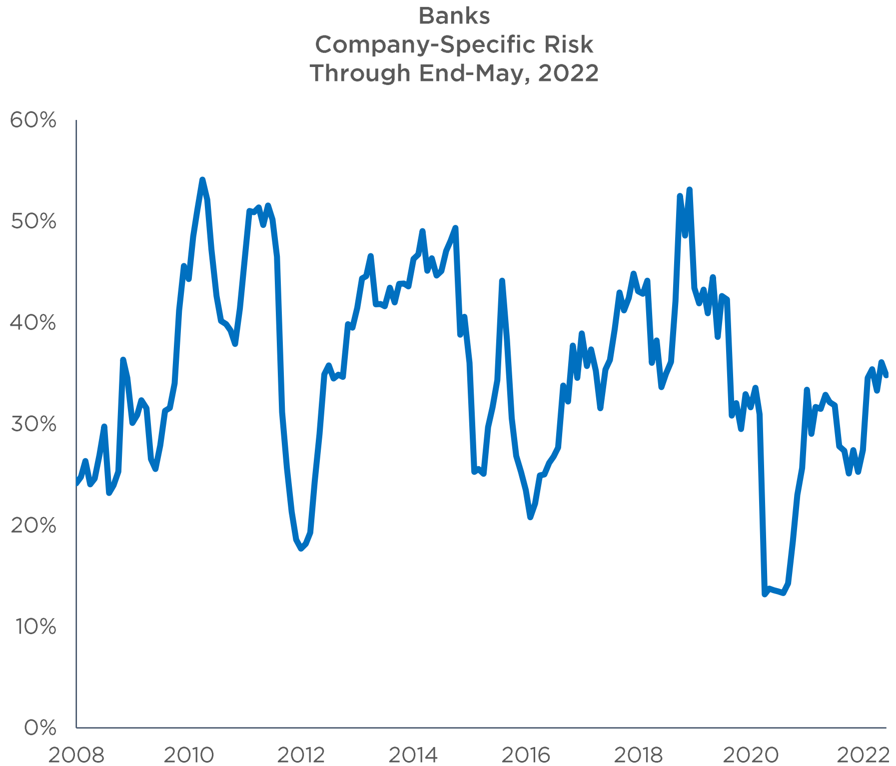
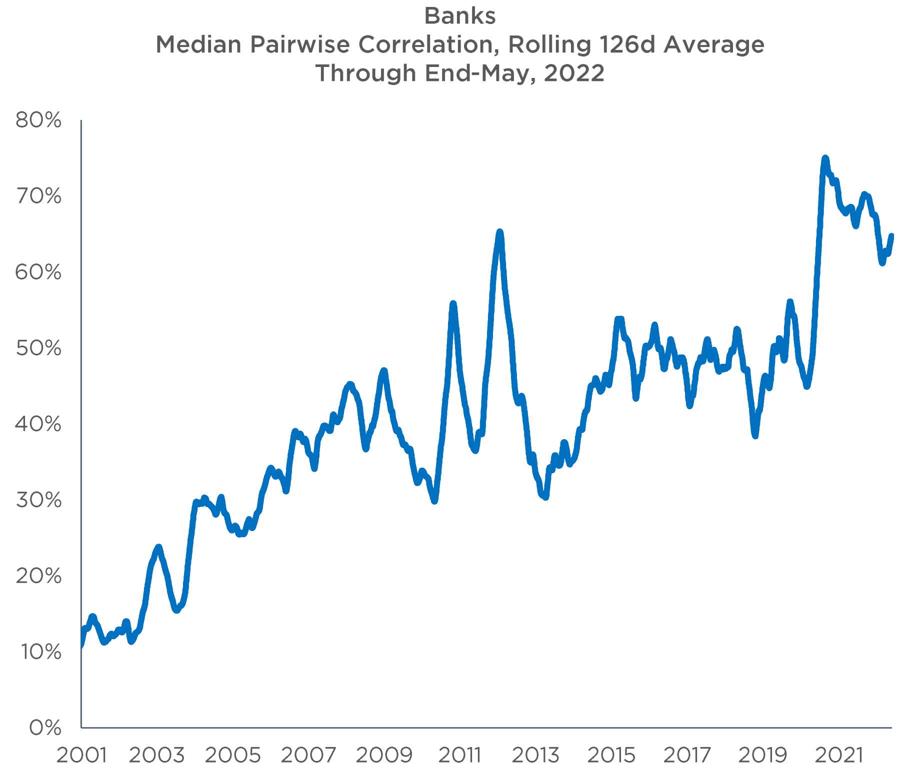
OTHER DATA SUGGEST STOCK SELECTION IN BANKS IS TOUGH TODAY

Company-specific risk for banks is roughly average for banks, below that of the overall market average (left chart). The average pairwise return correlation of banks is currently 0.6 on a twenty-year trend of higher correlation that was only 0.1 following the TMT crisis (right chart).





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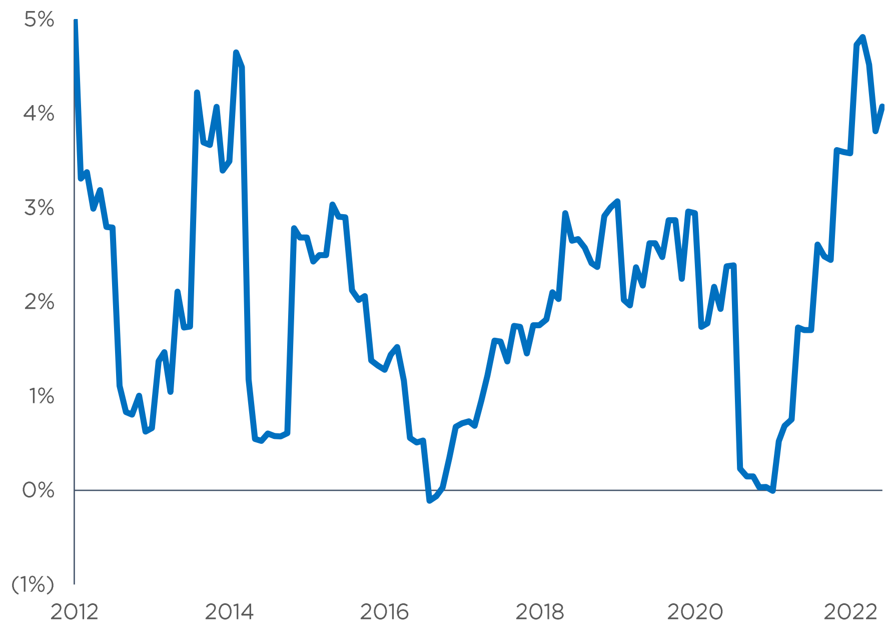
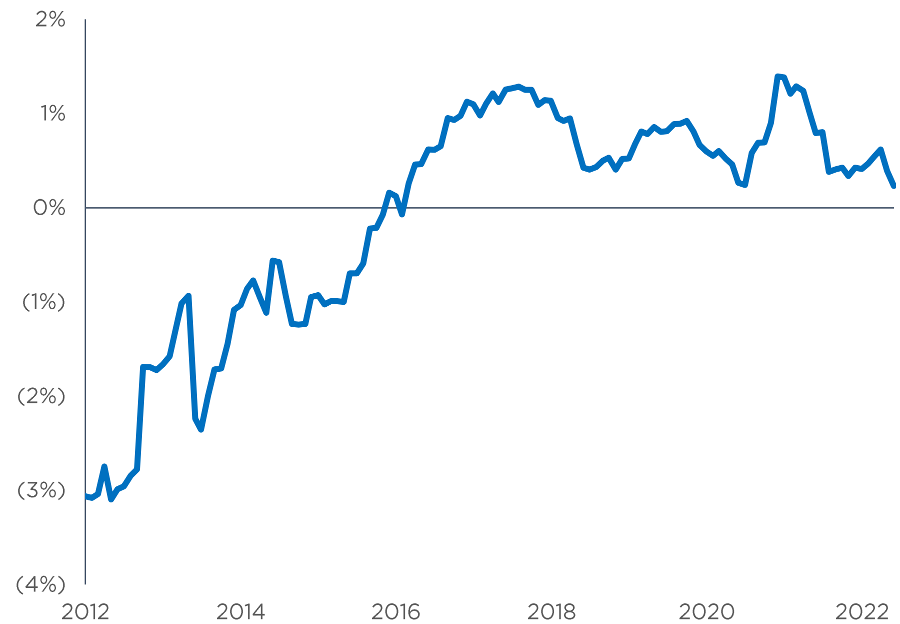
THE BIG 8: INCOME STATEMENT AND BALANCE SHEET IMPROVEMENT

The largest 8 banks (JPM, WFC, C, BAC, USB, PNC, GS, and MS) have markedly improved both their profitability and balance sheets over the last several years, on average better than the broader bank universe on both metrics – though costs impacted this trend the last two quarters. Nonetheless, return on tangible equity (left chart) is still elevated relative to the rest of banks (median ROTE of the Big 8 is now 18.4% vs 14.5% for the larger universe). The Big 8 have also improved their balance sheets over time, with what appears to be a sustainably higher Tier 1 Ratio than the broader group of banks (right chart). Our work shows relative valuations do not reflect the better PnLs.

Relative Return on Tangible Equity
Big 8 Banks Minus Top 3000 Median
Through End-May, 2022



Relative Tier One Ratio
Big 8 Banks Minus Top 3000 Average
Through End-May, 2022



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STOCK IDEAS BASED ON VALUATION AND GROWTH

Among the large banks (left), WFC, USB, and C are cheap relative to their own history. Stocks with substantial multiple expansion relative to book growth are shown on the right.

Big 8 Banks
Price-to-Tangible Book Percentile vs. History
Through End-May, 2022

Ticker	Company Name	Market Cap ($ US. Bil)	Price-to-Tangible Book	Percentile vs. History
JPM	JPMorgan Chase & Co.	388.37	1.92	51.3%
BAC	Bank of America Corporation	299.72	1.76	52.0%
WFC	Wells Fargo & Company	173.48	1.29	6.2%
MS	Morgan Stanley	150.68	2.15	64.0%
GS	The Goldman Sachs Group, Inc.	107.28	1.09	22.9%
C	Citigroup Inc.	103.72	0.67	8.7%
USB	U.S. Bancorp	78.85	2.36	13.8%
PNC	The PNC Financial Services Group, Inc.	72.55	2.18	53.5%

Banks Stocks with Relatively Weak Tangible Book Growth
That Have Also Seen Material Price-to-Tangible Book Multiple Expansion
August 4th, 2020 Through End-May, 2022

Ticker	Company Name	Market Cap ($ US. Bil)	Book Value Growth	Price-to-Tangible Book Growth
TFC	Truist Financial Corporation	66.22	(18.3%)	61.8%
FITB	Fifth Third Bancorp	27.05	(16.9%)	134.6%
RF	Regions Financial Corporation	20.64	(12.6%)	129.9%
CFG	Citizens Financial Group, Inc.	20.5	(4.3%)	107.3%
KEY	KeyCorp	18.61	(17.0%)	90.1%
CMA	Comerica Incorporated	10.88	(11.4%)	133.2%
ZION	Zions Bancorporation, National Association	8.63	(19.3%)	102.4%
CBSH	Commerce Bancshares, Inc.	8.35	(8.1%)	41.9%
CFR	Cullen/Frost Bankers, Inc.	8.01	(11.2%)	101.0%
BPOP	Popular, Inc.	6.26	(22.7%)	164.3%
SNV	Synovus Financial Corp.	6.2	(4.2%)	121.2%
BOKF	BOK Financial Corporation	5.87	(5.3%)	60.6%
FFIN	First Financial Bankshares, Inc.	5.85	(7.2%)	49.2%
UMBF	UMB Financial Corporation	4.47	(0.8%)	90.5%
PACW	PacWest Bancorp	3.64	(6.0%)	81.9%

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RESEARCH SUMMARY FOR SEMICONDUCTORS AND SOFTWARE

Most of our recent research has led us to believe that gross margin expansion above consensus expectations is crucial for success at this point in the cycle and has been important for identifying compounders over the last decade. Back on October 1, 2002, we initiated as the US Semiconductor analyst at Sanford C. Bernstein & Co, with a note title “Share Gainers and Margin Expanders Are Multiple Expanders”. Nineteen years later we wanted to research the relevance of share gain and margin expansion in software and semis to identify dislocated stocks that may signal an investment opportunity.

There is clearly some tension in the market on these key areas of technology, with high options activity and recent volatility reflecting supply chain concerns, etc. Going “back to the basics” of revenue growth vs. peers and margin expansion seems timely today. As such, we split each sector into high and low gross margin peer groups to account for substantial business model differences and searched for investment opportunities.

Semiconductors: Gross margin expansion is more important than share gain for both high and low gross margin chip makers. Multiple expansion / contraction and price momentum help us further refine the stock ideas. **Given the pullback in semis this year, we think the risk-reward is now getting attractive for many of these essential and high-quality businesses.**

Software: Revenue growth matters more than gross margin expansion among high gross margin companies. The only thing that matters for low gross margin software companies is improving gross margins.

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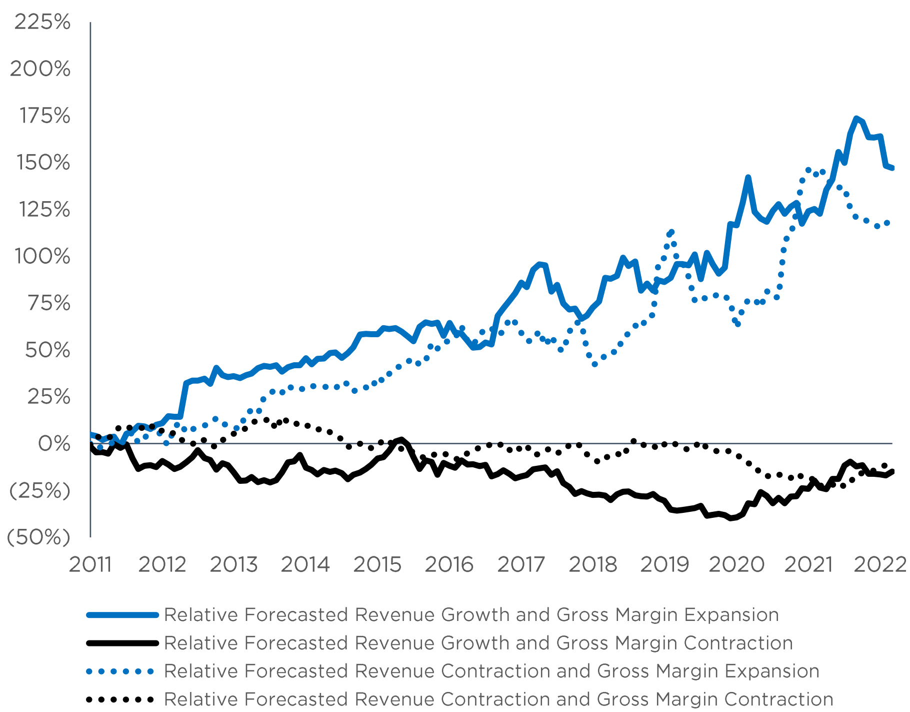
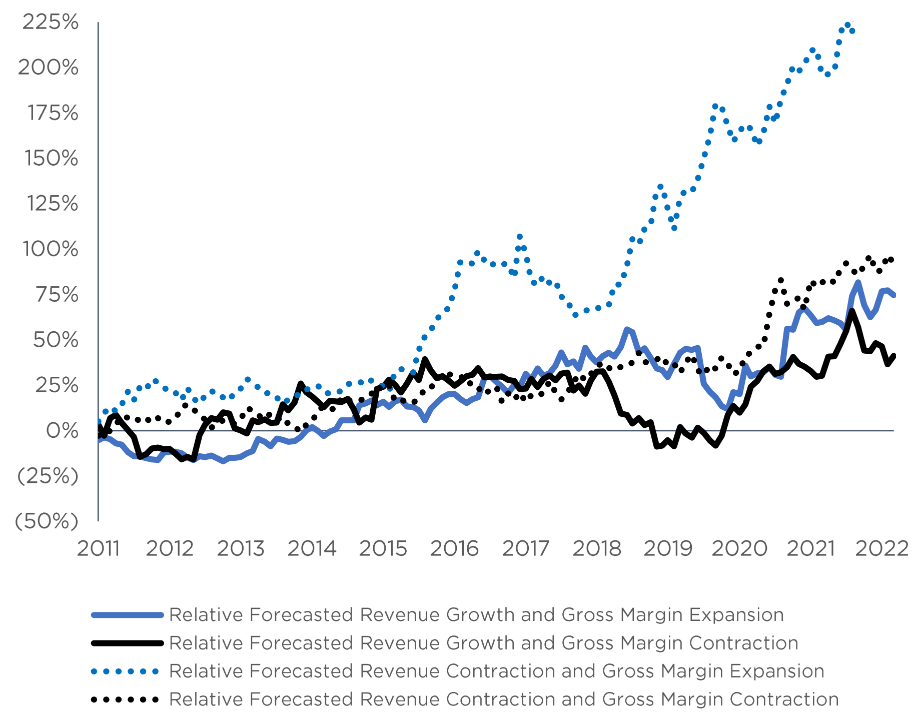
MARGIN EXPANSION MORE IMPORTANT THAN SHARE GAIN FOR CHIPS

Combining share gain / loss and margin expansion / contraction, we notice that among high margin semis (left chart) margin contraction is punished, independent of the forecasted revenue outlook, and margin expansion is rewarded. For low margin chip makers (right chart), forecasted share loss and gross margin expansion yields by far the best return – meaning the market wants low margin companies to chase higher margin revenue and improve their mix.

One-Month Forward Relative Return
High Gross Margin Semiconductors
Through End-May, 2022



One-Month Forward Relative Return
Low Gross Margin Semiconductors
Through End-May, 2022



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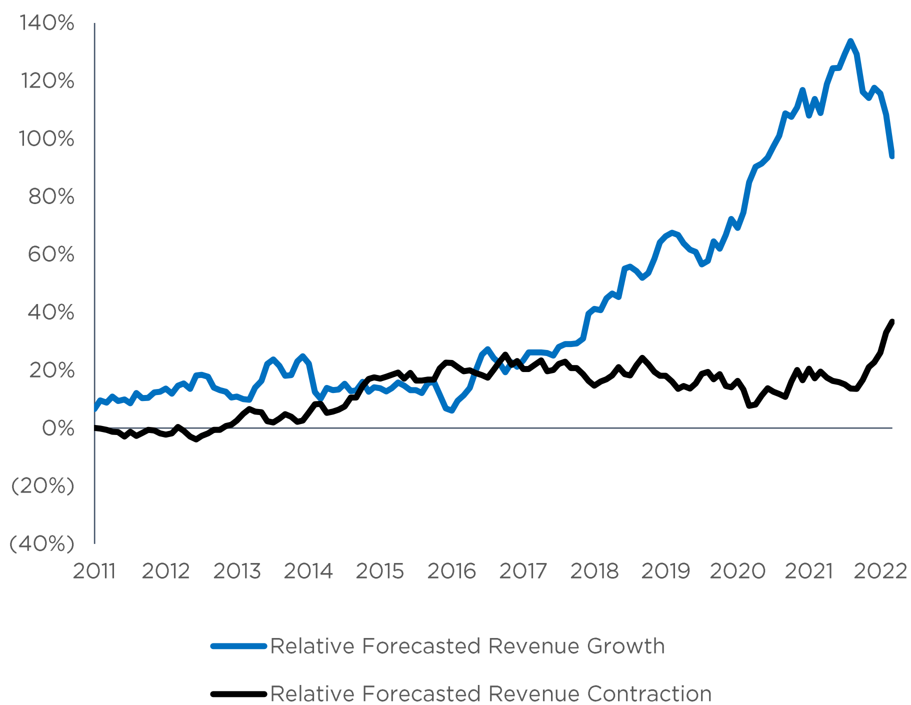
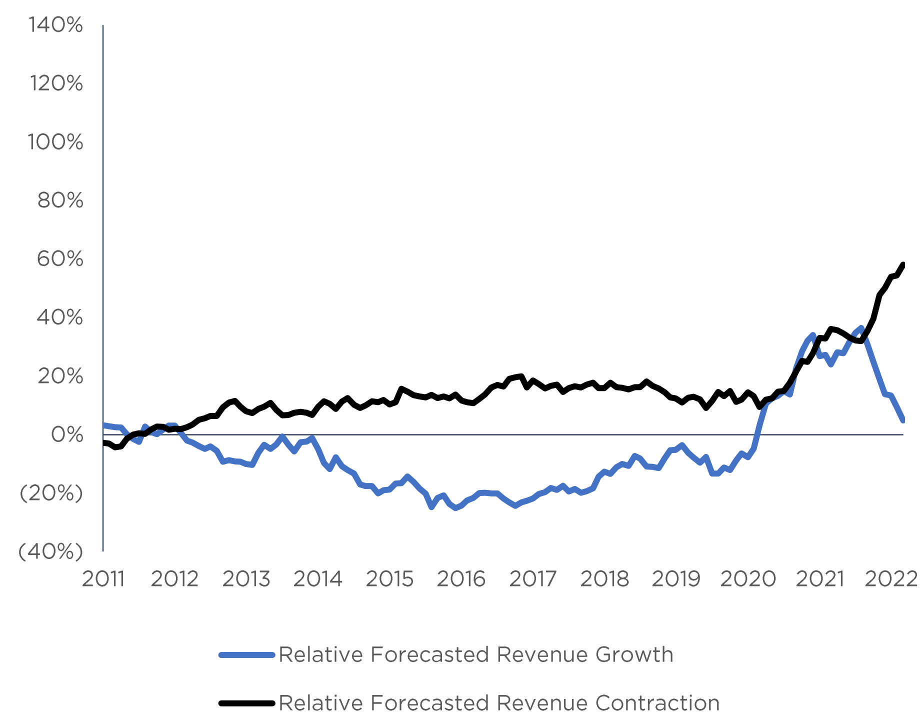
SHARE GAIN IS IMPORTANT FOR HIGH MARGIN SOFTWARE

For high gross margin software companies, it is extremely important for forecasted revenue growth to be faster than average (left chart), with strong outperformance for share gainers among the high margin software companies relative to those high margin software companies forecasted to be share losers. The recent growth scare caused a correction. Low gross margin software companies are generally weak stocks, whether forecasted revenue is high or low (right chart).

One-Month Forward Relative Return
High Gross Margin Software & Services
Through End-May, 2022



One-Month Forward Relative Return
Low Gross Margin Software & Services
Through End-May, 2022



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SEMICONDUCTOR STOCK IDEAS

High margin semis that are forecasted to have continued margin expansion and have recently lagged and seen multiple contraction subsequently perform best (buys, left table). High margin semi short ideas with poor momentum continue to be weak (sells, right table). For low gross margin semis, buying stocks with good recent price momentum and forecasted margin expansion is best (buys, left table). Low margin semis with poor momentum continue to lag (sells, right table).

Gross Margin-Based Semiconductor Stock Ideas
Buy High Gross Margin + Relative Gross Margin Growers, Multiple Contraction, and Low Momentum
Buy Low Gross Margin + Relative Gross Margin Growers with Lower Revenue Growth Expectations, Multiple Expansion, and High Momentum
Sell High Gross Margin + Relative Gross Margin Shrinkers, and Low Momentum
Sell Low Gross Margin + Sell Relative Gross Margin Shrinkers with Higher Revenue Growth Expectations, and Low Momentum
End-May 2022

Longs			Shorts		
Ticker	Company Name	Market Cap ($ US. Bil)	Ticker	Company Name	Market Cap ($ US. Bil)
ON	ON Semiconductor Corporation	26.37	QCOM	QUALCOMM Incorporated	160.41
MPWR	Monolithic Power Systems, Inc.	21.01	SEDG	SolarEdge Technologies, Inc.	15.11
QRVO	Qorvo, Inc.	11.85	ALGM	Allegro MicroSystems, Inc.	4.91
LSCC	Lattice Semiconductor Corporation	7.16	AMBA	Ambarella, Inc.	3.25
OLED	Universal Display Corporation	5.96	ACLS	Axcelis Technologies, Inc.	2.05
SYNA	Synaptics Incorporated	5.87	CAMT	Camtek Ltd.	1.30
TSEM	Tower Semiconductor Ltd.	5.25	NVTS	Navitas Semiconductor Corporation	0.98
MTSI	MACOM Technology Solutions Holdings, Inc.	3.81	ACMR	ACM Research, Inc.	0.90
FORM	FormFactor, Inc.	3.21	CEVA	CEVA, Inc.	0.84
MXL	MaxLinear, Inc.	3.06			
COHU	Cohu, Inc.	1.48			

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SOFTWARE STOCK IDEAS

For high gross margin software, stocks that have strong price momentum, but multiple contraction are buys (top left). Shorts are high margin software with strong momentum that are also seeing multiple expansion, as the sales growth is not offsetting the change in valuation (bottom left). Among low gross margin software, buys have good momentum and multiple expansion, the opposite of high margin (top right), and sells have high momentum.

High Gross Margin Software

Buy Relative Share Gainers, Multiple Contraction, and High Momentum
Sell Relative Share Losers, Multiple Expansion, and High Momentum
End-May, 2022

Long

Ticker	Company Name	Market Cap ($ US. Bil)
FTNT	Fortinet, Inc.	47.22
PAYC	Paycom Software, Inc.	16.5
BTRS	BTRS Holdings Inc.	0.81

Short

Ticker	Company Name	Market Cap ($ US. Bil)
ADBE	Adobe Inc.	196.79
ORCL	Oracle Corporation	191.89
ADSK	Autodesk, Inc.	45.19
PAYX	Paychex, Inc.	44.7
CDNS	Cadence Design Systems, Inc.	42.39
ZM	Zoom Video Communications, Inc.	32.06
PTC	PTC Inc.	13.63
BSY	Bentley Systems, Incorporated	10.71
DLB	Dolby Laboratories, Inc.	7.83
WEX	WEX Inc.	7.66
MSP	Datto Holding Corp.	5.81

Low Gross Margin Software

Buy Relative Gross Margin Growers, Multiple Expansion, and High Momentum
Sell Relative Gross Margin Shrinkers, High Momentum
End-May, 2022

Long

Ticker	Company Name	Market Cap ($ US. Bil)
FISV	Fiserv, Inc.	64.76
BR	Broadridge Financial Solutions, Inc.	17.14
DXC	DXC Technology Company	8.12
FIVN	Five9, Inc.	6.73
TIXT	TELUS International (Cda) Inc.	6.67
EEFT	Euronet Worldwide, Inc.	6.12
MNDT	Mandiant, Inc.	5.12
SWCH	Switch, Inc.	5.08
ENV	Envestnet, Inc.	3.68

Short

Ticker	Company Name	Market Cap ($ US. Bil)
ACN	Accenture plc	189.04
IBM	International Business Machines Corporation	124.88
ADP	Automatic Data Processing, Inc.	93.13
FIS	Fidelity National Information Services, Inc.	63.82
ROP	Roper Technologies, Inc.	46.86
CTSH	Cognizant Technology Solutions Corporation	38.93
IT	Gartner, Inc.	21.13
EPAM	EPAM Systems, Inc.	19.35
AKAM	Akamai Technologies, Inc.	16.2
JKHY	Jack Henry & Associates, Inc.	13.71
GDDY	GoDaddy Inc.	12.14

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SUMMARY AND CONCLUSIONS FOR INDUSTRIALS

We are negative on the industrials sector relative to the market and would initiate new shorts, or sell down large long positions now

1. **Macro softening:** Our proprietary gauge of macro indicators of industrial activity shows a softening of late after a huge recovery since March of 2020. Transportation metrics have slowed, with truck orders, dry van rate per mile, and total carloads all softer.
2. **Earnings expectations are high:** Despite the softening of macro data, bottom-up analyst earnings estimates for the GICS industrial sector appear to embed sustained economic strength, with above 20% YoY earnings growth forecasted each quarter through 2022, among the highest of any sector.
3. **Inventory not lean:** While there have been ample supply-chain shortages and logistics problems for many manufacturers, our judgment is that inventory levels for the industrials companies themselves are average.
4. **Group is expensive:** Valuations have become elevated, so unlike materials and energy which are cheap on peak earnings, many / most of the industrials' industries are in the 95th percentile or higher vs. their own history on EV-to-EBITDA.
5. **Use margin expectations to find short ideas:** Therefore, it appears that the key to investing today will be further margin expansion. Our judgment is to short stocks where incremental margin expectations are high.

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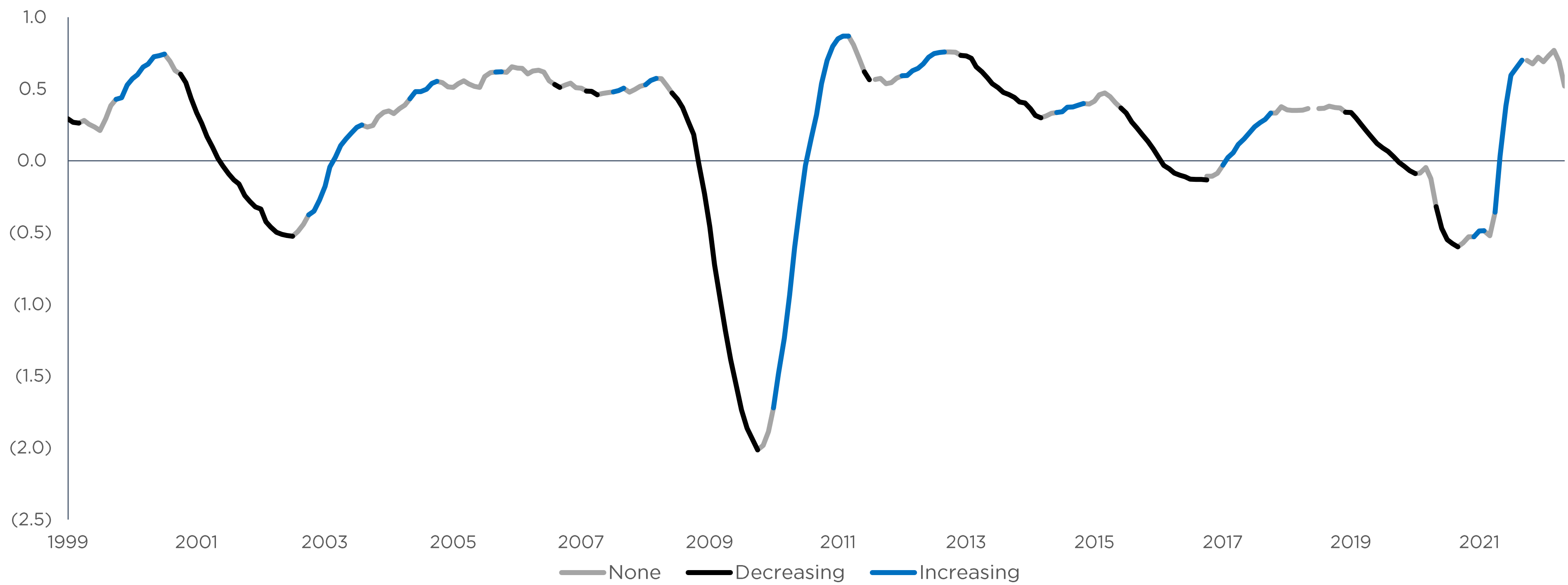
OUR INDUSTRIAL ACTIVITY GAUGE IS NO LONGER INCREASING

Our industrial activity gauge, which is a broad-based combination of several metrics like C&I loans, Baker Hughes rig count, private nonresidential construction, capacity utilization, new orders of durable goods, PMI, industrial production, and several others show that industrial activity rebounded sharply off the lows of March 2020. However, several signals have begun to roll-over. We are no longer in a regime of increasing industrial activity – it seems to have peaked, something we highlighted as a potential outcome in our early September cautious note on machinery and capital goods.

Trivariate's Industrial Activity Signal
Through End-May, 2022



TRIVARIATE RESEARCH

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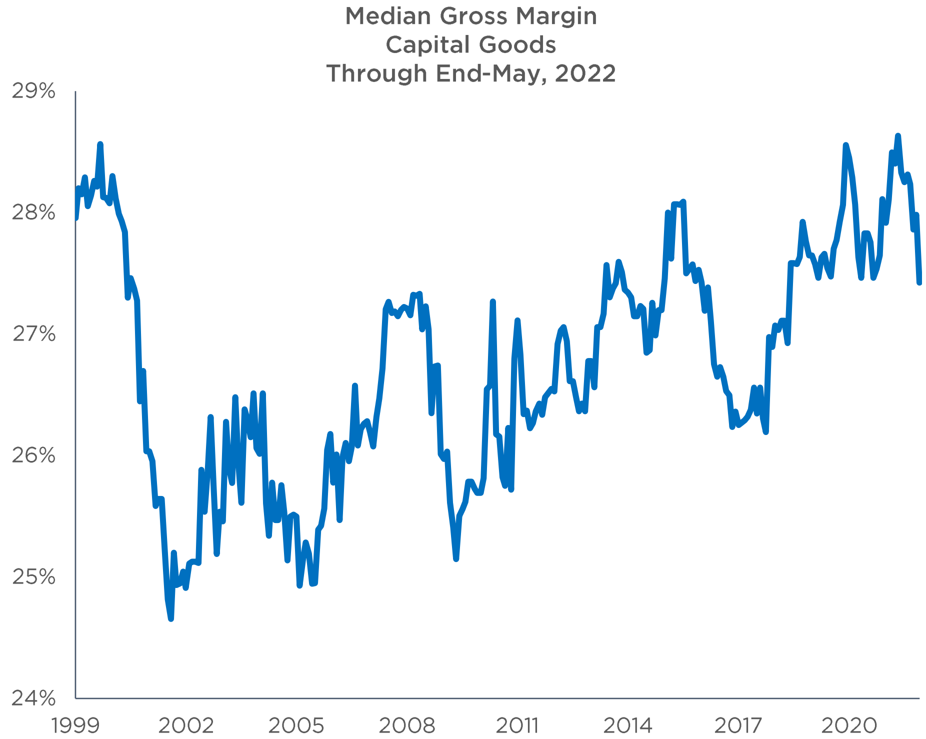
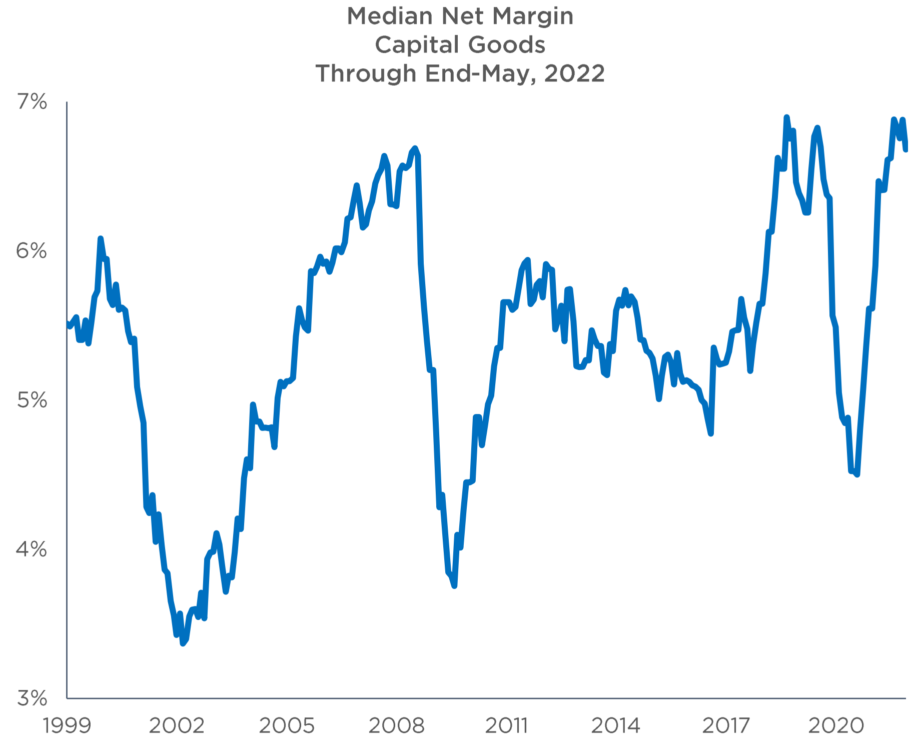
CAPITAL GOODS PROFITABILITY HAS RECOVERED

Within industrials, profitability (gross margin) had reached 20-year highs for the Capital Goods industry group, which makes up over 65% of industrials names with market capitalization over $1 billion (left chart). Net margins are also nearing peaks (right chart). With forward estimates for earnings growth strong even from these peak levels, it seems clear to us that stronger industrial activity and limited headwinds to future profitability will need to emerge for these forecast to be realized – and that does not seem likely to us.





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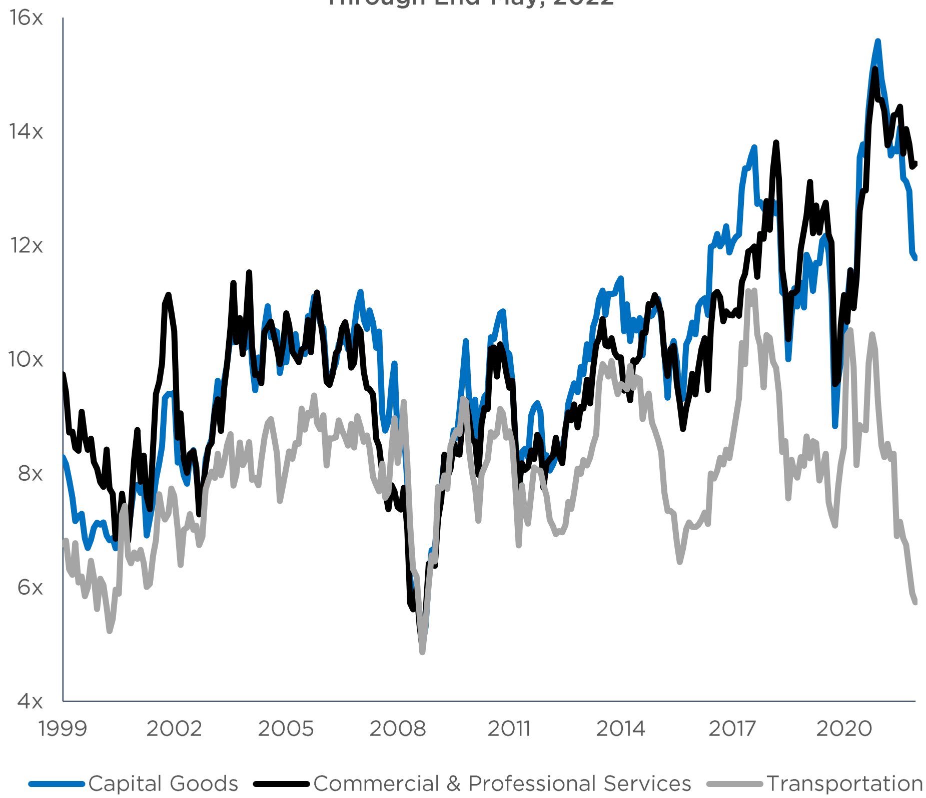
VALUATIONS HAVE EXPANDED FOR INDUSTRIALS

While other cyclicals like materials and energy have seen sharp multiple contraction as there is a view that they are over-earning, we have just started to see this the last few months for industrials, though elevated EV-to-EBITDA (left chart) multiples across capital goods and professional services remain. Conglomerates, commercial and professional services, machinery, and electrical equipment remain expensive vs. their own history (right chart). Airlines and marine are exceptions.

Median EV-to-EBITDA
Through End-May, 2022



Median EV-to-EBITDA
Percentile Rank vs. History
End-May, 2022

Industrials GICS Industry	Rank
Commercial Services & Supplies	96.4%
Industrial Conglomerates	89.1%
Machinery	88.7%
Aerospace & Defense	86.9%
Professional Services	86.6%
Construction & Engineering	81.1%
Trading Companies & Distributors	72.0%
Building Products	62.2%
Electrical Equipment	25.1%
Transportation Infrastructure	14.2%
Road & Rail	6.9%
Airlines	6.5%
Air Freight & Logistics	4.4%
Marine	1.1%

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SHORT IDEAS: IT ALL COMES DOWN TO MARGIN EXPECTATIONS

Our conclusion therefore is to short non-growth industrials with near-record profit margins that are forecasted to have improved profitability next year despite the industrial activity roll-over (left chart), or those with high incremental gross margin expectations that screen badly in our quantitative models (right chart). We think these are good places to search for short ideas

High 2022 Incremental Margin Forecasts and Already At / Near Record Profitability
End-May, 2022

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
DE	Deere & Company	Machinery	109.35
RSG	Republic Services, Inc.	Commercial Serv. & Supplies	42.28
CTAS	Cintas Corporation	Commercial Serv. & Supplies	40.76
PH	Parker-Hannifin Corporation	Machinery	34.94
VRSK	Verisk Analytics, Inc.	Professional Services	27.62
FTV	Fortive Corporation	Machinery	22.14
J	Jacobs Engineering Group Inc.	Professional Services	18.02
WAB	Westinghouse Air Brake Tech.	Machinery	17.25
BLDR	Builders FirstSource, Inc.	Building Products	11.25
AGCO	AGCO Corporation	Machinery	9.55
WSO	Watsco, Inc.	Trading Companies & Dist.	9.10
WCC	WESCO International, Inc.	Trading Companies & Dist.	6.37
XPO	XPO Logistics, Inc.	Road & Rail	6.15
CLH	Clean Harbors, Inc.	Commercial Serv. & Supplies	5.08
SSD	Simpson Manufacturing Co., Inc.	Building Products	4.68
WTS	Watts Water Technologies, Inc.	Machinery	4.38
BECN	Beacon Roofing Supply, Inc.	Trading Companies & Dist.	4.22
AWI	Armstrong World Industries, Inc.	Building Products	3.92
ABM	ABM Industries Incorporated	Commercial Serv. & Supplies	3.23
EPAC	Enerpac Tool Group Corp.	Machinery	1.18
SXI	Standex International Corp.	Machinery	1.12
CMCO	Columbus McKinnon Corporation	Machinery	0.96

High Forecasted Incremental Margins vs. Current Gross Margins
Bottom Half of Trivariate Quantitative Model
End-May, 2022

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
CAT	Caterpillar Inc.	Machinery	115.13
DE	Deere & Company	Machinery	109.35
JCI	Johnson Controls International	Building Products	37.92
CMI	Cummins Inc.	Machinery	29.51
FTV	Fortive Corporation	Machinery	22.14
CNHI	CNH Industrial N.V.	Machinery	20.22
IR	Ingersoll Rand Inc.	Machinery	19.14
WAB	Westinghouse Air Brake Tech.	Machinery	17.25
MAS	Masco Corporation	Building Products	13.38
ALLE	Allegion plc	Building Products	9.80

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