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TRIVARIATE RESEARCH

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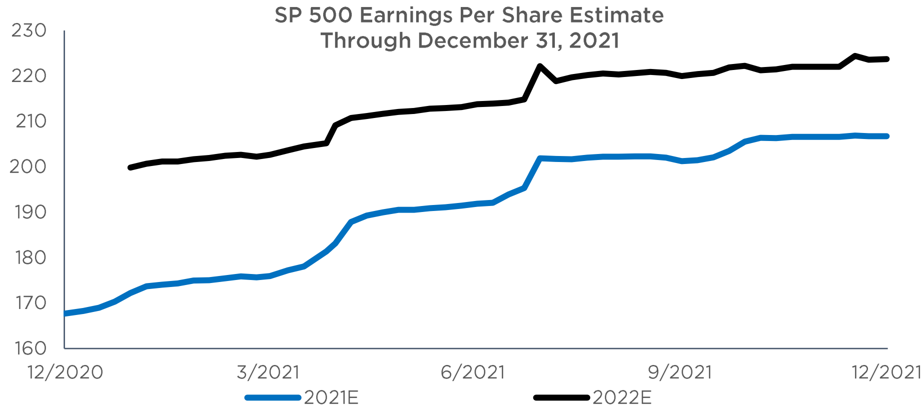
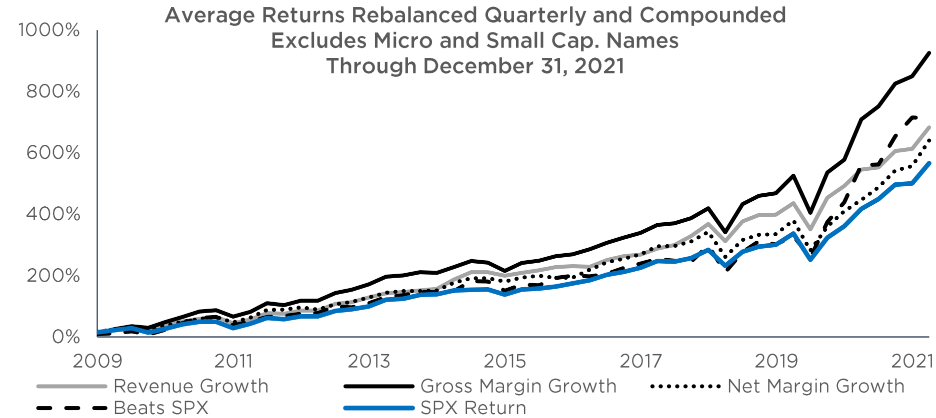
For further information on our Quantitative Framework, or our notes on the challenges of alpha generation, FAANGM, BATJ (Baidu, Alibaba, Tencent, JD.com) or ESG ETFs please contact us or log into our website www.trivariateresearch.com for access.

FOUR CHARTS YOU SHOULD NOT MISS

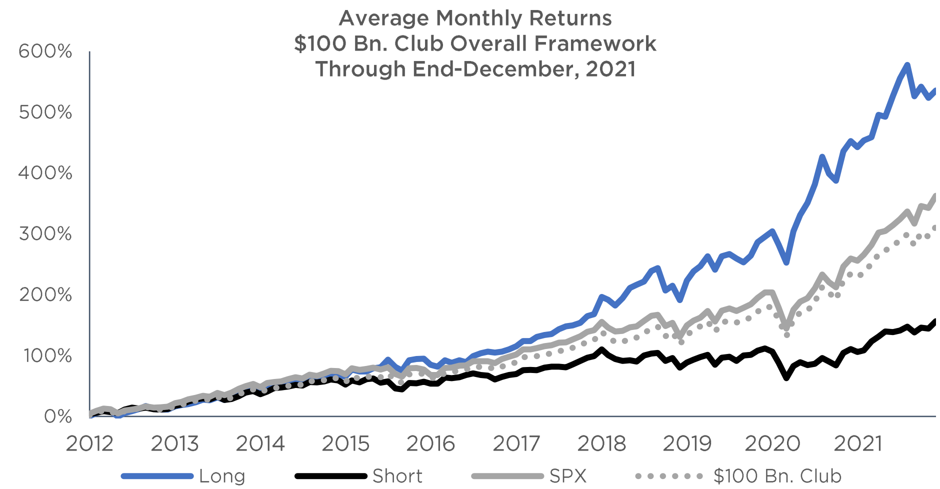
Earnings expectations have continued to rise all year (upper left). The key focus today should be gross margin expansion, as this leads to the highest likelihood of compounding (upper right). Our sector bets include energy / materials over industrials, discretionary over staples, healthcare over tech, and utilities over REITS (bottom left). We identified a stock picking framework for the Nifty Ninety (the stocks over $100 billion market cap), including our quant models and sell-side consensus (bottom right).





Trivariate Sector Recommendations

Sector	Trivariate Recommendation	Comments
Materials	Max Overweight	Prefer copper long-term, steel near-to-medium term
Energy	Max Overweight	Oil is rising, and M&A is likely
Health Care	Overweight	Healthcare services are rate-sensitive, and demand trends are above GDP
Consumer Discretionary	Overweight	Retailing, reopening, and services better than durables
Utilities	Equal-Weight	Some idiosyncratic bets probably sensible
Communication Services	Equal-Weight	Makes sense to keep market-weight FAANGM
Financials	Equal-Weight	Large cap banks better than regionals
Real Estate	Under-Weight	Commercial real-estate is challenged
Information Technology	Under-Weight	Semis are over-earning, focus on margin expansion / cash flow generation
Consumer Staples	Under-Weight	Plenty of short ideas in idiosyncratic staples
Industrials	Max Underweight	Industrial activity is rolling over, but earnings expectation are very high



INVESTMENT CONCLUSIONS

- **We remain bullish on the US stock market.** We see earnings growth expectations of 8% as potentially achievable, and even if estimates ultimately prove to be too high in the 2H of 2022, economic and earnings growth are likely in 2022, a backdrop that is usually good for equity market appreciation. The consensus views this year as a mid-cycle correction, and many are positioning for a defensive year – we disagree.
- **Valuation:** Pushback is usually around the elevated market multiple. While the market is expensive relative to its own history at 21x forward earnings, the constitution of the market has changed. Nearly 20% of the top 3000 US stocks market cap is FAANGM. Roughly 20% of the market is pharma & biotech. or software companies, where belief in sustained growth matters. Signs of management hubris are missing, as capital spending-induced impediments to margin expansion in most industries do not appear likely and inventory risk is small. The key is whether wage and commodity inflation and supply chain disruption will cause broad based margin contraction, hampering 2022 earnings. We think the current perception of how hawkish the Fed is will prove wrong – as the Fed is unlikely to raise rates more than once this year in our judgment – if at all. We do not have stable price or full employment, the dual-mandate pre-requisites for that action in our judgment.

INVESTMENT CONCLUSIONS

- **Gross exposure advice:** We ingest over 150 macro variables and conclude that the consumer backdrop remains strong. Economic and industrial activity are also at high levels, but have leveled-off in recent weeks in aggregate.
- **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 REITS and industrials are all huge risks that grew after COVID-19 roiled markets in Q1 2020. When considering risk, investors should consider correlation convexity and negative asymmetric beta. We wrote recently about crypto as a new risk to monitor. Not owning FAANGM has also proven to be risky, with the massive outperformance of large stocks in 2021, and in Q4 in particular. All 11 GICS sectors on an equally-weighted basis lagged the SP500 in Q4 2021 for the first time ever – that's how much cap is a risk.
- **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 really important, as acquirers buying something 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.

WE ARE OPTIMISTIC ABOUT US EQUITIES

- **The key to security selection** remains gross margin expansion, and hence the main "macro" investment controversy is whether rising input costs (labor, materials, transportation) can be passed on to end-customers, or whether margins will contract next year
- **IN SUMMARY:** We have a healthy US economy, growing earnings, impediments to margin expansion that include labor, raw goods and transportation logistics, offset by fiscal stimulus and an accommodative monetary policy. The biggest risks in our mind are input costs rising faster than revenue for select companies, the Fed materially tightening, though a material reset due to policy related to the COVID Omicron variant, thought that appears to be waning, or increased China tension could also unnerve the market at these levels.
- **Sector recommendations:** We like energy / materials over industrials, despite the recent downward revisions in industrials we expected. We like discretionary over staples, healthcare over technology, and utilities over REITS. We like large banks over small cap.

EARNINGS EXPECTATIONS PEAKED IN Q2 AND DECELERATE UNTIL Q1

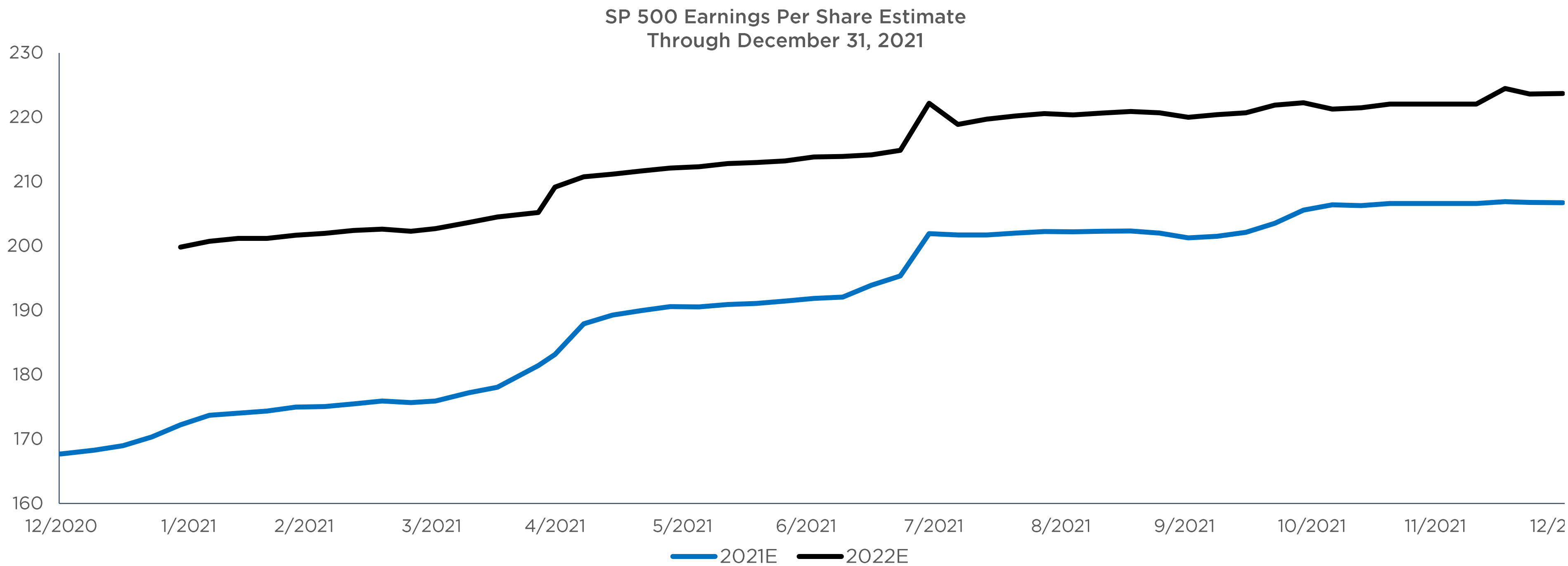
The bottom-up YoY earnings growth was 36.7% for Q3, down from the 92.4% growth in Q2 (a function of the COVID trough) but up from where expectations were at the end of Q2. Earnings are expected to decelerate but remain in the mid-twenties through Q4, trough in Q2 2021, and then accelerate again from there. The energy sector lost money in 2020, so the rebound is to be expected. Industrials companies have very high YoY earnings growth expectations every quarter through 2022, which we thinks create poor relative estimate achievability.

Bottom-Up Analyst Earnings Growth Expectations
December 31, 2021

Sector	1Q21	2Q21	3Q21	4Q21E	1Q22E	2Q22E	3Q22E	4Q22E
S&P 500	46.7%	92.4%	36.7%	21.0%	6.8%	4.7%	7.3%	14.1%
S&P ex-Financials	33.2%	73.1%	38.0%	26.3%	14.5%	10.7%	10.2%	15.4%
Consumer Discretionary	224.2%	258.2%	12.1%	(1.4%)	(1.8%)	20.7%	36.8%	57.3%
Consumer Staples	8.3%	16.4%	(1.8%)	0.3%	4.6%	4.4%	13.1%	10.3%
Energy	16.0%	N/A	N/A	N/A	175.1%	60.0%	6.0%	(13.2%)
Financials	130.9%	251.8%	30.9%	(0.6%)	(21.1%)	(19.7%)	(6.6%)	7.3%
Health Care	21.7%	20.1%	25.5%	14.6%	11.5%	9.2%	2.2%	12.7%
Industrials	(4.6%)	384.1%	66.6%	104.2%	49.2%	29.5%	35.9%	36.6%
Info Tech	37.7%	41.9%	34.6%	14.5%	7.1%	5.7%	6.5%	12.7%
Materials	53.7%	128.3%	82.2%	59.8%	38.1%	2.8%	(3.8%)	(11.9%)
Communication Services	49.7%	68.2%	36.6%	8.4%	(0.3%)	(0.0%)	5.5%	17.7%
Utilities	(1.0%)	13.7%	5.9%	2.1%	7.9%	(11.4%)	(0.7%)	18.4%
REITS	3.4%	27.5%	22.8%	17.7%	9.2%	3.9%	7.4%	9.7%

EARNINGS EXPECTATIONS HAVE RISEN OVER 23% IN THE LAST YEAR

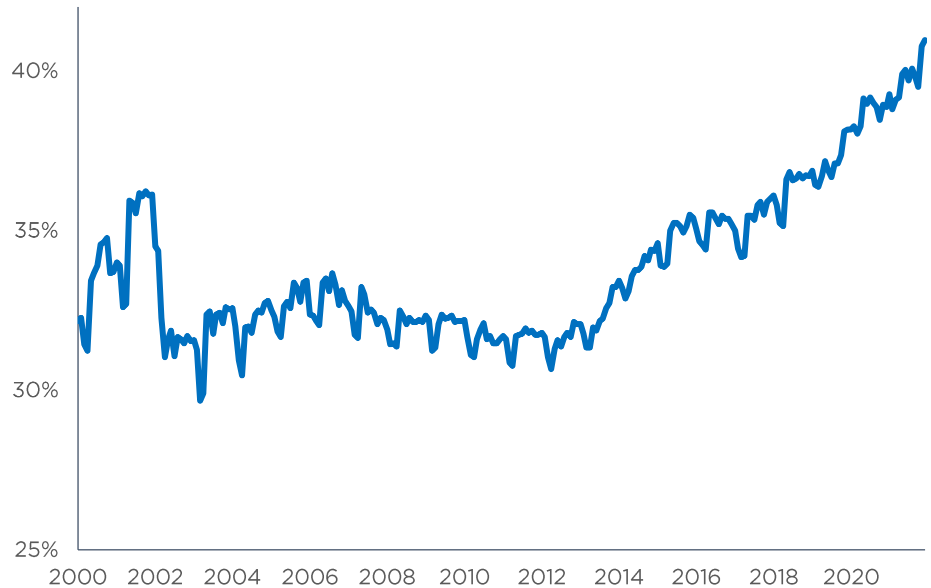
The bottom-up median analyst earnings expectations have sharply risen all year. Since the end of 2020, 2021 estimated EPS is up 23.3% (from $167.68 to $206.73) and 2022 estimated EPS is up 12.0% (from $199.80 to $223.69). It is unusual for actual earnings estimates at the end of year to exceed the initial forecasted estimates for the following year. Analysts on average forecast 14% earnings growth at the beginning of each year, and the actual growth has been closer to 6%. The only year's initial analyst estimates have ultimately proven to be too low were recession recoveries, or the year after, when the analysts collectively get too pessimistic at the bottom. That behavior was born out again this cycle, though the sheer magnitude of the upward revisions throughout the year is notable



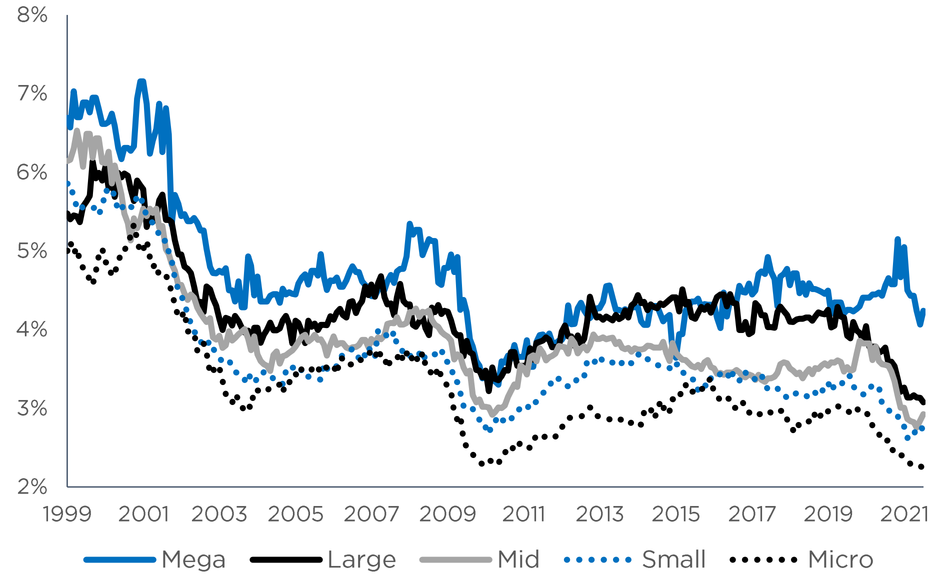
INVENTORY AND CAPITAL SPENDING ARE NOT BURDENS TO PROFITS

We are not believers that margins for US companies will mean-revert to some long-term average. Overall inventory is less of a risk than it was in the past, because now over 40% of the top 3000 US equities do not even have inventory as part of their business model. 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 area 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. However, we generally have not seen any increases in capital intensity (right chart), with large cap capital intensity at 20-year lows, so there is limited fear of over-producing consumption in the near-to-medium term.

% of Top 3000 US Companies That Have Zero Inventory Dollars Through End-December, 2021



Capital Spending to Sales By Market Cap Group Through End-December, 2021

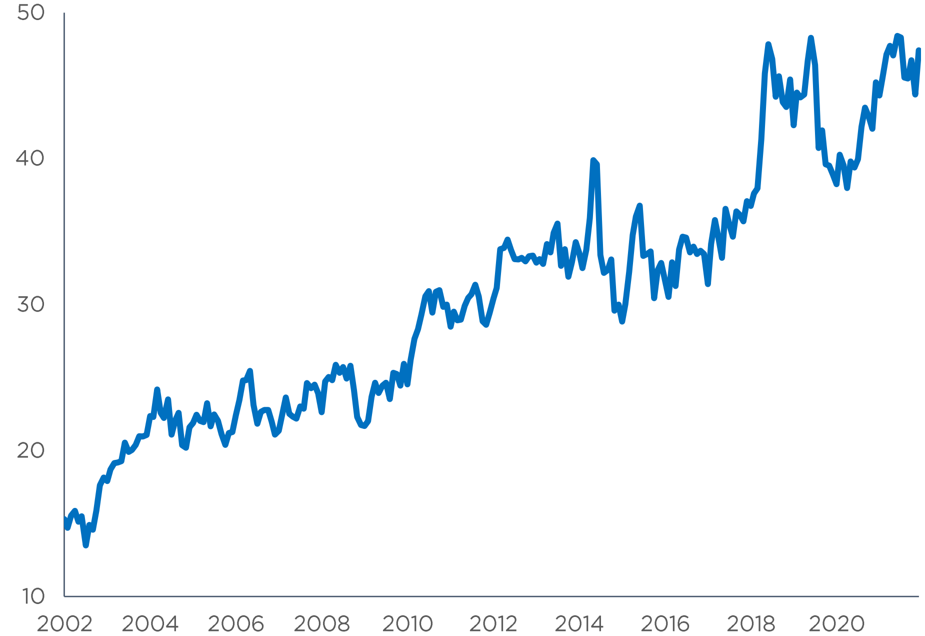


IS VALUATION DEFENSIBLE? CONSTITUENTS HAVE SHIFTED

Roughly twenty percent, or 600 of the biggest 3000 public US equities are currently in the Software & Services or Pharmaceuticals, Biotechnology, and Life Sciences industries. That is nearly twice the number we had 20 years ago! Investors are buying long-dated potential growth, not current profitability (left chart). 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 near a record level of 44 months straight, up from just under two years in 2007.

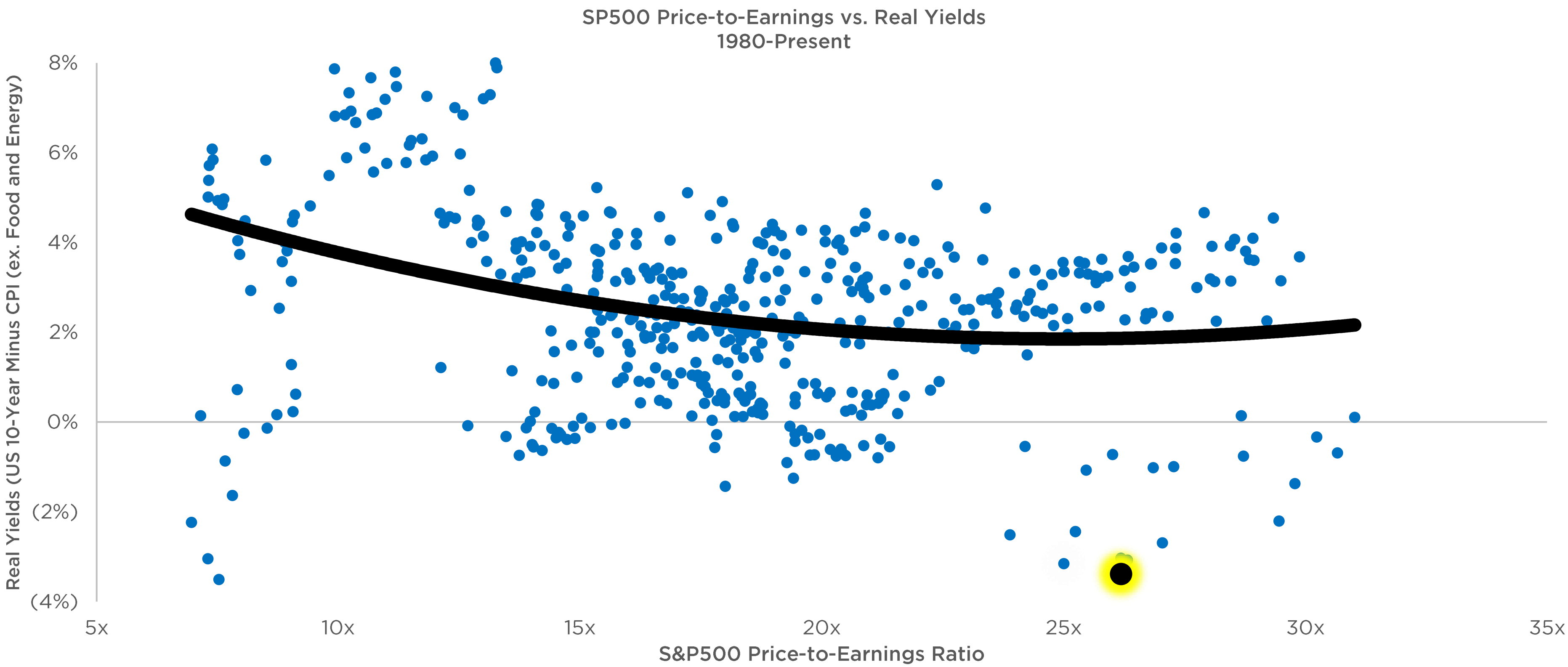
Software Plus Biotechnology
Percentage of Companies in the Top 3000
Through End-December, 2021

Average Number of Consecutive Months
An SP500 Growth Stock Has Been in Growth Universe
Through End-December, 2021



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 market has determined that 10%-12% (an example of the 10-year yield minus CPI from the early 1980s) is different than 1.7% minus 5% (roughly today's figures).



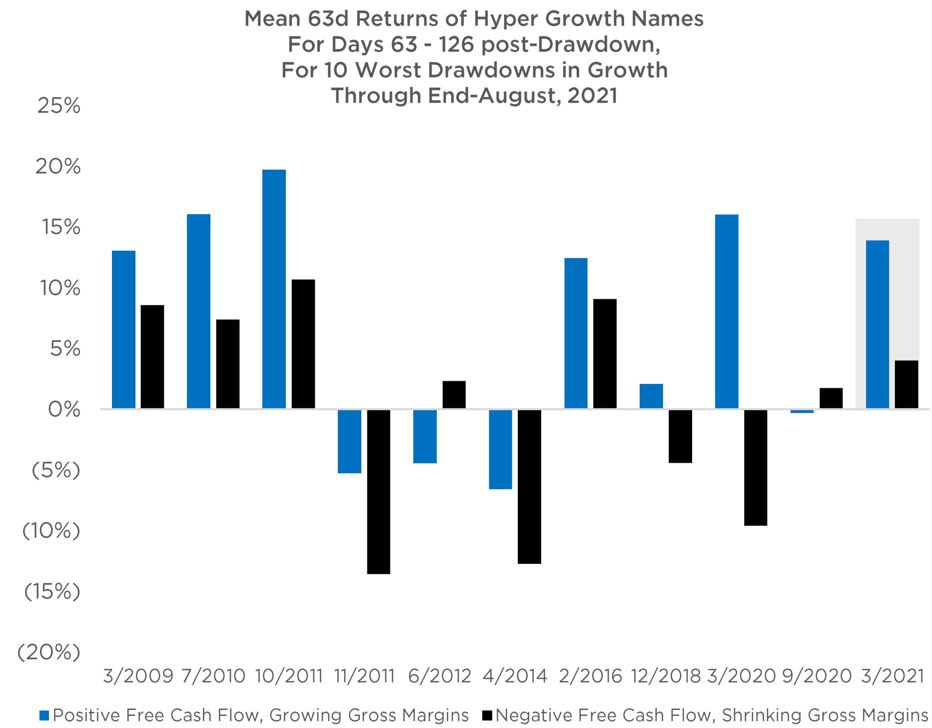
SUMMARY OF VIEWS ON GROWTH STOCKS

- We evaluated 11 prior growth-stock sell-offs since 2008 and identified that the key signals to focus on following every sell-off are largely similar – positive free cash flow and gross margin expansion. These typically work better than very fast growing, high margin, and low free cash flow stocks, which were more the type of growth stock that worked in 2020.
- 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 – please contact us for stock ideas.
- We looked at industry-level revenue growth and relative to SP500 price-to-forward sales and compared the forecasted growth and multiples to historical averages. Every industry is forecasted to grow faster than its long-term average next year. Energy is expected to grow nearly 45% faster than its average over the next year, but its relative sales multiple is nearly a third of its long-term average, as oil prices recover. Software is expected to grow 16% slower than average but is 35% more relatively expensive than average.
- 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. Stock ideas are shown on page 17.
- Attributes associated with identifying “melting ice cubes” are different – what matters is accruals and prior weak stock performance relative to peers. Stocks to avoid are shown.
- New CEOS for expensive growth stocks can underperform.

AFTER THE GROWTH SELL OFF USE MARGINS AND POSITIVE FCF

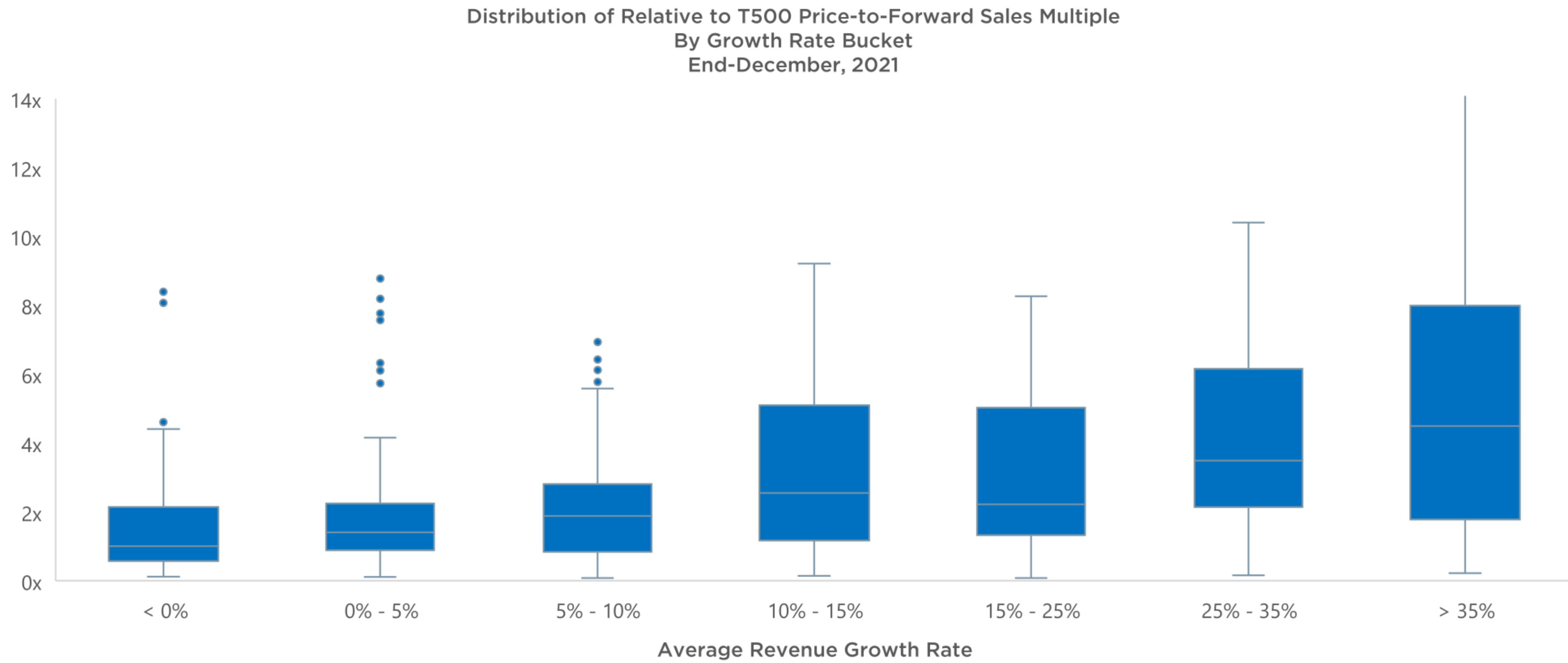
The sharp growth stock sell-off starting in mid-February may be over, but clearly is still the source of apprehension, particularly given the starting valuation levels prior to the sell-off were the most extreme since the financial crisis. On an absolute basis the 2021 was only the 11th worst drawdown (left chart), but relative to the SP500 the drawdown lasted until May 13th and was the WORST index-relative growth-stock drawdown since the financial crisis. Since then, through 2021 and into 2022 stocks with positive free cash flow and growing margins have beaten the opposite by nearly 10%, showing the historical trend continued (right chart).

Date			Drawdown			
Starting	Ending	Days of Drawdown	Absolute	Relative	Prior 12-Month Momentum	Growth : Market Price-to-Sales Multiple
2/20/2020	3/23/2020	23	(30.4%)	3.4%	(8.1%)	1.7x
10/14/2008	3/9/2009	100	(30.2%)	1.5%	(30.2%)	1.7x
10/2/2018	12/24/2018	58	(24.2%)	(5.0%)	(0.5%)	1.8x
7/25/2011	10/3/2011	50	(21.4%)	(3.5%)	2.5%	2.1x
7/21/2015	2/8/2016	140	(17.9%)	(6.0%)	(2.7%)	1.7x
4/26/2010	7/2/2010	49	(17.3%)	(1.7%)	20.7%	1.7x
4/4/2012	6/1/2012	41	(12.4%)	(3.2%)	(3.8%)	1.9x
9/3/2020	9/23/2020	14	(11.5%)	(1.9%)	39.1%	2.3x
3/6/2014	4/11/2014	27	(11.0%)	(8.1%)	21.7%	1.8x
11/9/2011	11/25/2011	12	(10.6%)	(1.5%)	(5.2%)	2.1x
2/16/2021	3/8/2021	15	(10.4%)	(2.8%)	35.5%	2.1x



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!**



LONG / SHORT GROWTH STOCK IDEAS

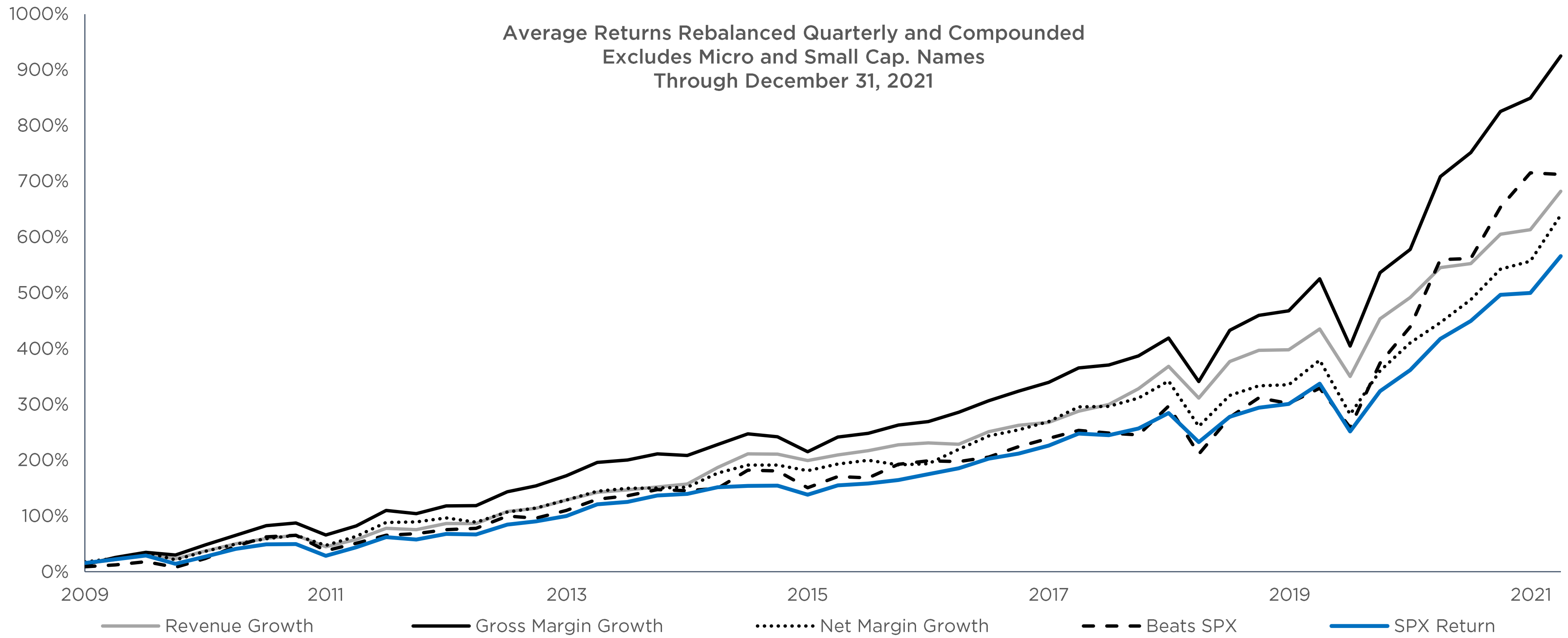
Current ideas where revenue growth is forecasted to accelerate but relative multiples are low (left) and where growth is forecasted to slow but multiples are high (right). Many of the buy ideas are levered to an economy that continues to reopen.

Buy Cheap Relative to Bucket or Moving to Higher Revenue Bucket, Short Expensive Relative to Bucket or Moving to Lower Revenue Bucket
End-December, 2021

Long				Short			
Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)	Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
HUM	Humana Inc.	Health Care Equip. & Serv.	59.62	NVDA	NVIDIA Corporation	Semis & Semi Equipment	735.28
MAR	Marriott International, Inc.	Consumer Services	53.82	V	Visa Inc.	Software & Services	456.94
CNC	Centene Corporation	Health Care Equip. & Serv.	48.08	MA	Mastercard Incorporated	Software & Services	353.05
PXD	Pioneer Natural Resources Company	Energy	44.40	ABT	Abbott Laboratories	Health Care Equip. & Serv.	241.36
MCK	McKesson Corporation	Health Care Equip. & Serv.	37.95	AMT	American Tower Corporation	Real Estate	133.21
ABC	AmerisourceBergen Corporation	Health Care Equip. & Serv.	27.66	ISRG	Intuitive Surgical, Inc.	Health Care Equip. & Serv.	128.36
LUV	Southwest Airlines Co.	Transportation	25.36	TGT	Target Corporation	Retailing	110.89
DAL	Delta Air Lines, Inc.	Transportation	24.93	BDX	Becton, Dickinson and Company	Health Care Equip. & Serv.	71.68
CHWY	Chewy, Inc.	Retailing	24.65	FIS	Fidelity National Information Services, Inc.	Software & Services	66.47
BBY	Best Buy Co., Inc.	Retailing	24.44	PSA	Public Storage	Real Estate	65.68
CCL	Carnival Corporation & plc	Consumer Services	22.56	NEM	Newmont Corporation	Materials	49.56
KMX	CarMax, Inc.	Retailing	21.08	ZS	Zscaler, Inc.	Software & Services	45.01
W	Wayfair Inc.	Retailing	19.86	NET	Cloudflare, Inc.	Software & Services	42.31
MOH	Molina Healthcare, Inc.	Health Care Equip. & Serv.	18.58	AVB	AvalonBay Communities, Inc.	Real Estate	35.24
WAB	Westinghouse Air Brake Technologies Corporation	Capital Goods	17.21	ANSS	ANSYS, Inc.	Software & Services	35.00
CTRA	Coterra Energy Inc.	Energy	15.46	VRSN	VeriSign, Inc.	Software & Services	28.19
CAH	Cardinal Health, Inc.	Health Care Equip. & Serv.	14.51	MAA	Mid-America Apartment Communities, Inc.	Real Estate	26.42
UAL	United Airlines Holdings, Inc.	Transportation	14.18	IR	Ingersoll Rand Inc.	Capital Goods	25.22
AMC	AMC Entertainment Holdings, Inc.	Media & Entertainment	13.98	BBY	Best Buy Co., Inc.	Retailing	24.44
JLL	Jones Lang LaSalle Incorporated	Real Estate	13.59	CLX	The Clorox Company	Household & Personal Products	21.42
HST	Host Hotels & Resorts, Inc.	Real Estate	12.42	SSNC	SS&C Technologies Holdings, Inc.	Software & Services	20.84
TRGP	Targa Resources Corp.	Energy	11.96	HOLX	Hologic, Inc.	Health Care Equip. & Serv.	19.25
AAL	American Airlines Group Inc.	Transportation	11.63	PODD	Insulet Corporation	Health Care Equip. & Serv.	18.35

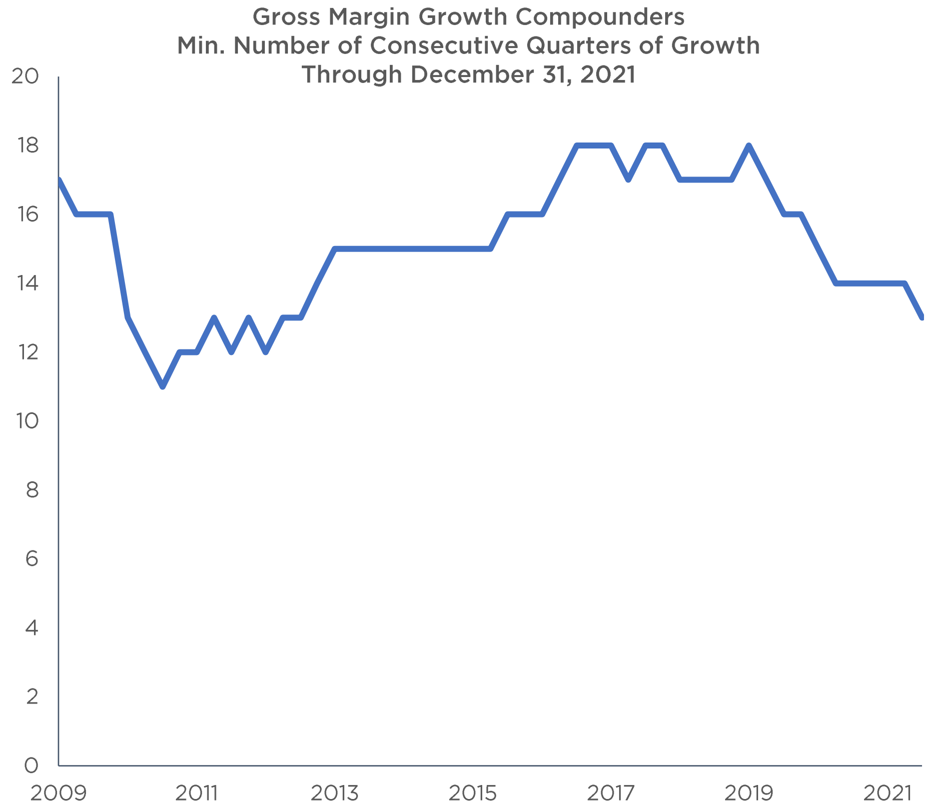
BUY CONSISTENT GROSS MARGIN EXPANDERS

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.



GROSS MARGIN GROWTH COMPOUNDERS ARE BEST

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 TEAM (right chart) among others.



Gross Margin Growth Compounders
And Forecasted Gross Margin Growth
December 31, 2021

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
AVGO	Broadcom Inc.	Semis & Semi. Equip.	274.73
AMD	Advanced Micro Devices, Inc.	Semis & Semi. Equip.	173.78
TEAM	Atlassian Corporation Plc	Software	96.37
MO	Altria Group, Inc.	Tobacco	87.05
SNAP	Snap Inc.	Interactive Media & Services	75.71
SNPS	Synopsys, Inc.	Software	56.54
IDXX	IDEXX Laboratories, Inc.	Health Care Equip. & Supplies	55.83
KEYS	Keysight Technologies, Inc.	Electro. Equipm. Inst. & Comp.	37.80
GPC	Genuine Parts Company	Distributors	19.97
CVNA	Carvana Co.	Specialty Retail	19.84
QRVO	Qorvo, Inc.	Semis & Semi. Equip.	17.24
OTEX	Open Text Corporation	Software	12.89
RH	RH	Specialty Retail	11.51
SITE	SiteOne Landscape Supply, Inc.	Trading Comp. & Distributors	10.83
LSCC	Lattice Semiconductor	Semis & Semi. Equip.	10.55
DBX	Dropbox, Inc.	Software	9.33
NTRA	Natera, Inc.	Biotechnology	8.83
RL	Ralph Lauren Corporation	Textiles, App & Luxury Goods	8.75
AN	AutoNation, Inc.	Specialty Retail	7.66
LITE	Lumentum Holdings Inc.	Communications Equipment	7.65
AZTA	Azenta, Inc.	Semis & Semi. Equip.	7.61
NTNX	Nutanix, Inc.	Software	6.91

WHAT IS A MELTING ICE CUBE?

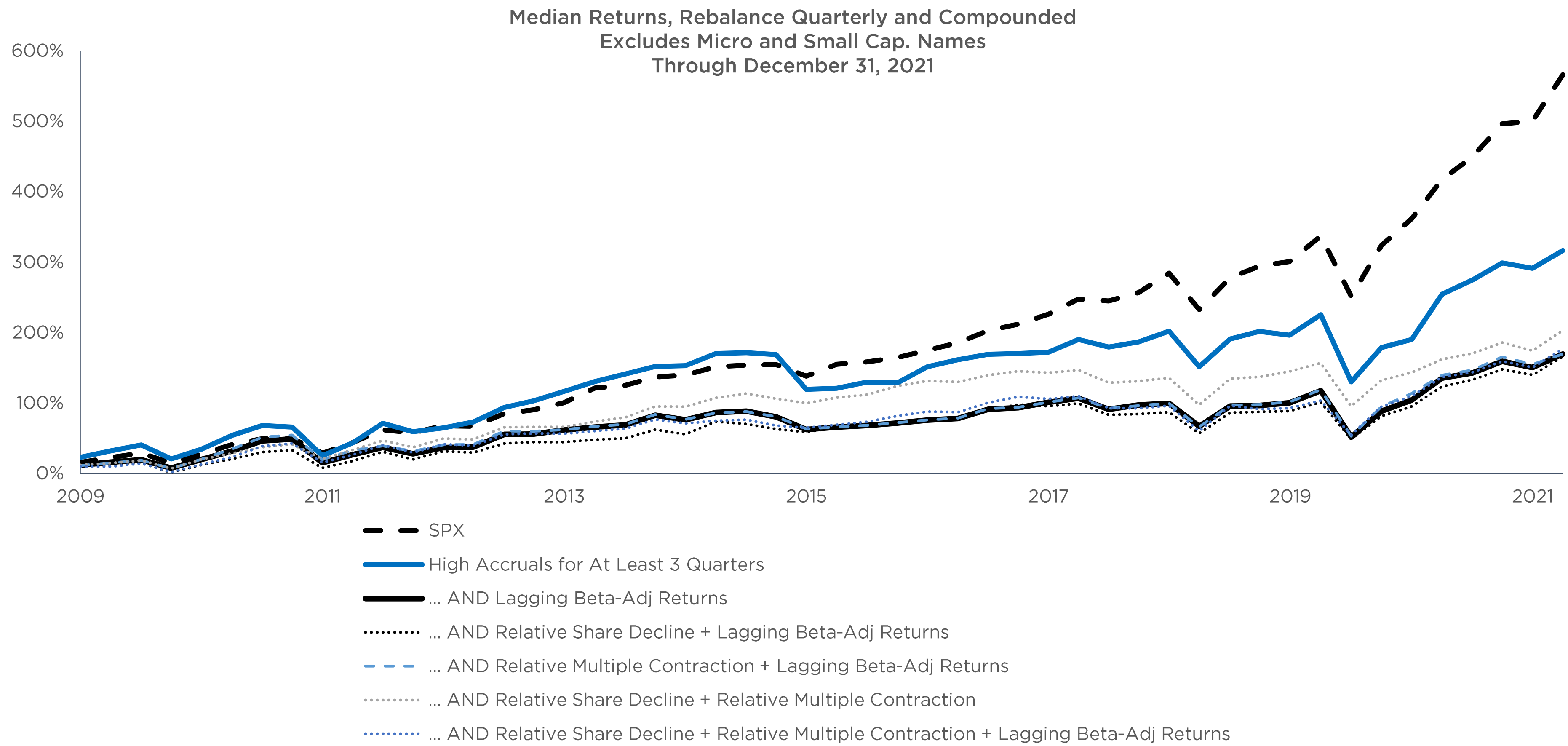
Accruals and price momentum are best: Our analysis clearly shows that these two variables identify relative underperformers far better than the others. This works confirms some work we had done years ago on short-selling, and while the result is not surprising to us, we found many in the past who were 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. 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 beat 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. Finding revenue share losers, prior multiple contractors, or gross margin contractors, does not lead to subsequent incremental underperformance. Our list of short ideas (i.e., the melting ice cubes) are shown below.

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.



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 3 Consecutive Quarters & Lagged Peers this past Quarter
Earnings after 1/15

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
AMZN	Amazon.com, Inc.	Retailing	1691.00
FB	Meta Platforms, Inc.	Media & Entertainment	935.64
TMUS	T-Mobile US, Inc.	Telecommunication Services	144.87
IDXX	IDEXX Laboratories, Inc.	Health Care Equip. & Services	55.83
DXCM	DexCom, Inc.	Health Care Equip. & Services	52.04
CMG	Chipotle Mexican Grill, Inc.	Consumer Services	49.19
SRE	Sempra	Utilities	42.24
CPRT	Copart, Inc.	Commercial & Professional Services	35.96
SWKS	Skyworks Solutions, Inc.	Semis & Semi Equipment	25.66
HZNP	Horizon Therapeutics Public Limited Company	Pharmaceuticals, Biotechnology & Life Sciences	24.44
CTLT	Catalent, Inc.	Pharmaceuticals, Biotechnology & Life Sciences	21.92
CVNA	Carvana Co.	Retailing	19.84
PODD	Insulet Corporation	Health Care Equip. & Services	18.35
MKTX	MarketAxess Holdings Inc.	Diversified Financials	15.64
RH	RH	Retailing	11.51
AXON	Axon Enterprise, Inc.	Capital Goods	10.75
GH	Guardant Health, Inc.	Health Care Equip. & Services	10.17
STOR	STORE Capital Corporation	Real Estate	9.36
LAD	Lithia Motors, Inc.	Retailing	8.99
SRPT	Sarepta Therapeutics, Inc.	Pharmaceuticals, Biotechnology & Life Sciences	7.84
OLED	Universal Display Corporation	Semis & Semi Equipment	7.78
KRC	Kilroy Realty Corporation	Real Estate	7.74
ORI	Old Republic International Corporation	Insurance	7.38
FYBR	Frontier Communications Parent, Inc.	Telecommunication Services	7.21
IAA	IAA, Inc.	Commercial & Professional Services	6.83
SKX	Skechers U.S.A., Inc.	Consumer Durables & Apparel	6.76

NOT ALL NEW CEOS ARE GOOD

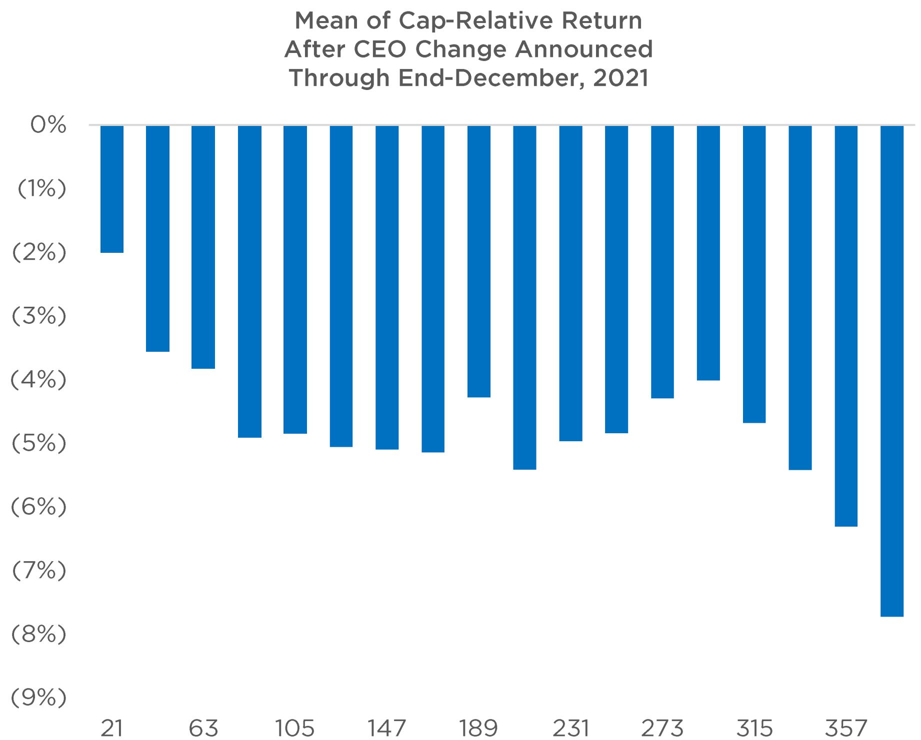
We analyzed stock behavior following the announcements of new CEOs. Stocks making new CEO announcements underperform on a volatility-adjusted basis, meaning short of some deep understanding of the new CEO's strategy, exiting / shorting stocks with a new CEO is on average prudent. The cumulative performance takes nearly 18 months to catch up to the average stock.

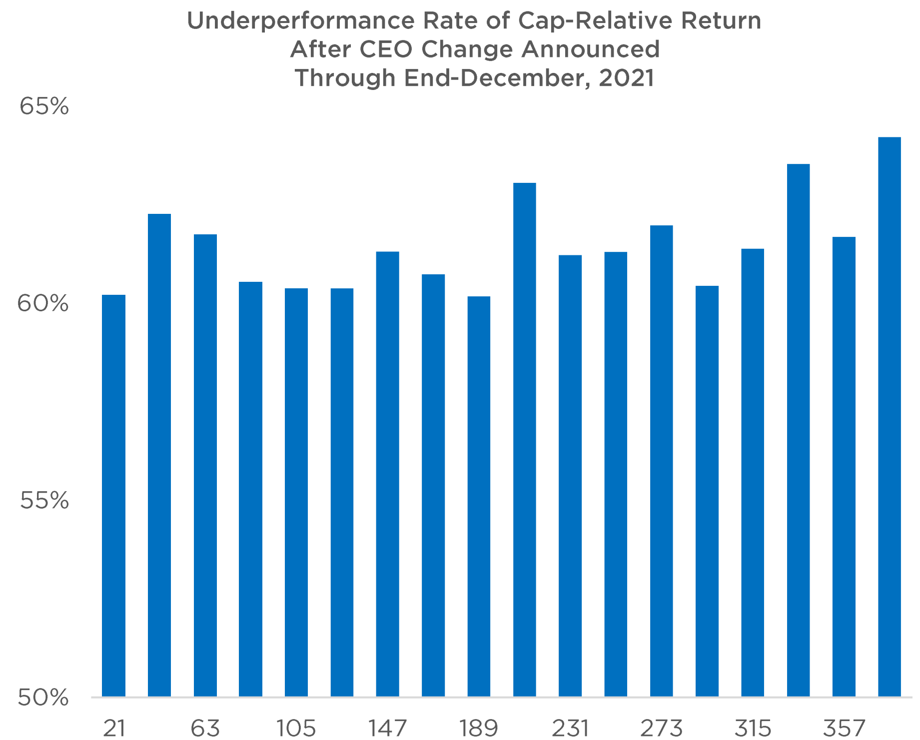
Size, style, and valuation matter: The average underperformance is longest for mega / large cap stocks, eight months on average, where management changes likely take longer to be effective. Micro/small and mid-cap underperformance is three-to-four months on average. Underperformance is most pronounced for growth stocks, in particular technology and healthcare, where the consensus perception of growth and management's confidence in its achievability is paramount and the need for a new CEO questions that outlook. Expensive stocks making CEO changes underperform, likely a correlated concept to growth stock underperformance.

Conclusion: We evaluated expensive growth stocks that made an announcement of a CEO change, 64% of which underperform their market-cap group over the subsequent eight months. We view selling long positions or initiating new shorts in expensive growth stocks making CEO changes as prudent. Value stocks, stocks with a meaningful dividend, or higher quality stocks do not statistically significantly lag following CEO announcements. For shorter-term strategies, the underperformance lasts sustainably even after the announcement date, so it is not too late to short the day after the announcement. Stocks with new CEOs are shown below. 20 of the last 27 expensive growth stocks have lagged their peer group YTD, with 16 of them down double digits in absolute terms since the news.

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).





EXPENSIVE GROWTH STOCKS WITH NEW CEOS IN THE LAST YEAR

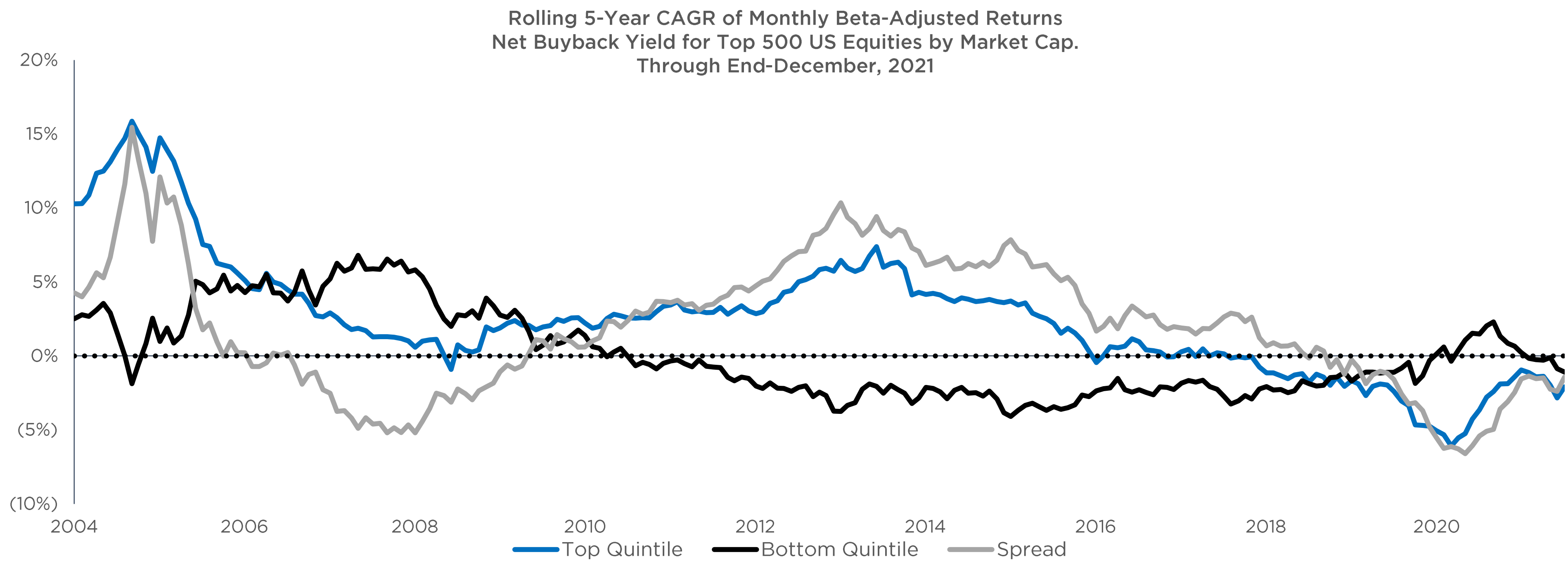
Below we show expensive growth stocks with CEO changes. Since the announcement, absolute performance, and performance of each stock relative to the average stock in their market cap cohort, shows this trend has continued this year. HUBS, VAL, and IRTC are notable exceptions, but 23 of 33 have lagged their peer group since the announcement, with 16 stocks down double-digits.

Performance After CEO Change Announced
Expensive Growth Stocks
Through End-December, 2021

Ticker	Company Name	Industry	Date Announced	Return	Cap-Relative Return	Market Cap ($ US. Bil)
AMZN	Amazon.com, Inc.	Internet & Direct Marketing Retail	2/3/2021	0.7%	(25.8%)	1608.71
CRM	salesforce.com, inc.	Software	12/1/2021	1.0%	(4.2%)	278.98
SNPS	Synopsys, Inc.	Software	9/14/2021	10.8%	5.0%	50.67
MAR	Marriott International, Inc.	Hotels, Restaurants & Leisure	2/23/2021	10.5%	(6.0%)	37.72
LUV	Southwest Airlines Co.	Airlines	6/25/2021	(21.5%)	(28.1%)	36.35
TWTR	Twitter, Inc.	Interactive Media & Services	11/30/2021	(1.6%)	(6.5%)	35.07
SPLK	Splunk Inc.	Software	11/15/2021	(15.8%)	(13.0%)	26.63
HUBS	HubSpot, Inc.	Software	3/1/2021	25.2%	14.2%	23.86
RCL	Royal Caribbean Cruises Ltd.	Hotels, Restaurants & Leisure	11/9/2021	(15.8%)	(12.9%)	21.51
DT	Dynatrace, Inc.	Software	11/15/2021	(14.6%)	(11.8%)	21.38
AAL	American Airlines Group Inc.	Airlines	12/7/2021	0.4%	(0.9%)	11.45
GH	Guardant Health, Inc.	Health Care Providers & Services	8/6/2021	(12.3%)	(15.4%)	11.10
WYNN	Wynn Resorts, Limited	Hotels, Restaurants & Leisure	11/10/2021	(7.6%)	(5.7%)	10.30
ANGI	Angi Inc.	Interactive Media & Services	2/25/2021	(38.8%)	(51.0%)	6.99
LMND	Lemonade, Inc.	Insurance	7/26/2021	(52.1%)	(55.7%)	6.72
NEO	NeoGenomics, Inc.	Life Sciences Tools & Services	3/2/2021	(33.9%)	(45.8%)	5.96
PGNY	Progyny, Inc.	Health Care Providers & Services	11/5/2021	(19.9%)	(13.5%)	5.49
SFIX	Stitch Fix, Inc.	Internet & Direct Marketing Retail	4/14/2021	(59.6%)	(62.3%)	5.27
EVBG	Everbridge, Inc.	Software	12/10/2021	6.9%	5.2%	4.37
SEAS	SeaWorld Entertainment, Inc.	Hotels, Restaurants & Leisure	5/6/2021	22.2%	20.2%	4.33
NEWR	New Relic, Inc.	Software	5/14/2021	85.5%	82.8%	4.06
WISH	ContextLogic Inc.	Internet & Direct Marketing Retail	11/11/2021	(43.1%)	(37.6%)	3.20
JJSF	J & J Snack Foods Corp.	Food Products	5/14/2021	(8.1%)	(10.8%)	3.13
CNK	Cinemark Holdings, Inc.	Entertainment	7/29/2021	2.0%	0.9%	2.57
VAL	Valaris Limited	Energy Equipment & Services	12/9/2021	17.5%	16.2%	2.33
IRTC	iRhythm Technologies, Inc.	Health Care Equipment & Supplies	6/2/2021	87.5%	88.1%	2.21
WKHS	Workhorse Group Inc.	Automobiles	7/29/2021	(62.9%)	(64.0%)	2.04
VLDR	Velodyne Lidar, Inc.	Electronic Equipment, Instruments & Components	7/19/2021	(46.5%)	(53.1%)	2.02
KIDS	OrthoPediatrics Corp.	Health Care Equipment & Supplies	5/6/2021	(2.7%)	0.9%	1.15
BJRI	BJ's Restaurants, Inc.	Hotels, Restaurants & Leisure	7/7/2021	(26.4%)	(22.1%)	1.14
RIDE	Lordstown Motors Corp.	Automobiles	8/26/2021	(46.8%)	(44.3%)	1.10
LIND	Lindblad Expeditions Holdings, Inc.	Hotels, Restaurants & Leisure	3/30/2021	(18.5%)	(17.3%)	1.04

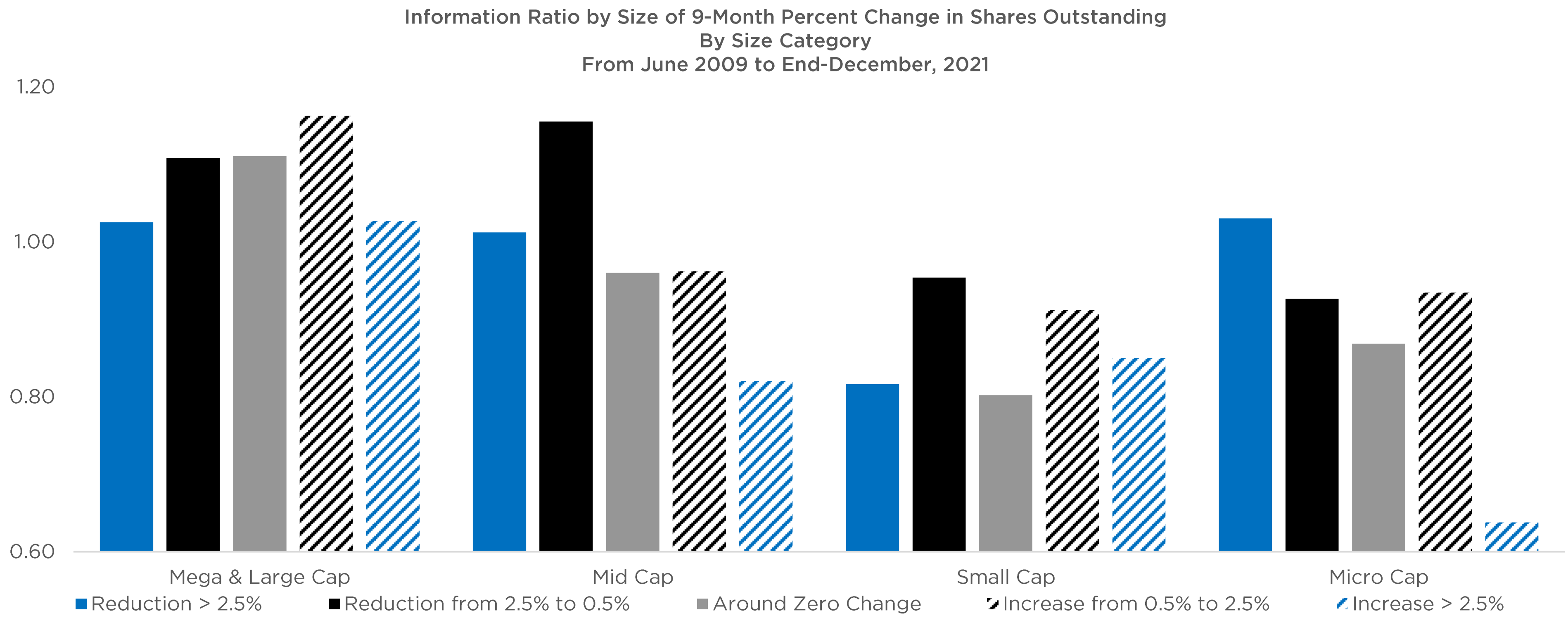
DO STOCK BUYBACKS DRIVE SHAREHOLDER VALUE? ANSWER: NO

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.



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 inferior 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.



MANAGEMENT TEAMS THAT SHOULD PIVOT TO DIVIDENDS?

We show companies since 2019 that have bought back 10% or more of their shares and are down in absolute terms since then (left side) including BIIB, ATUS, and KSS. On the right, we show mega / large cap, quality, value stocks that have bought back 1% or more of their shares in the last 9 months, a strategy that was historically not effective for relative subsequent return for these cohorts. This includes MDLZ, YUM, AFL, and OTIS

Names that Bought Back 10% or More of Shares & Underperformed 2019 to End-December, 2021

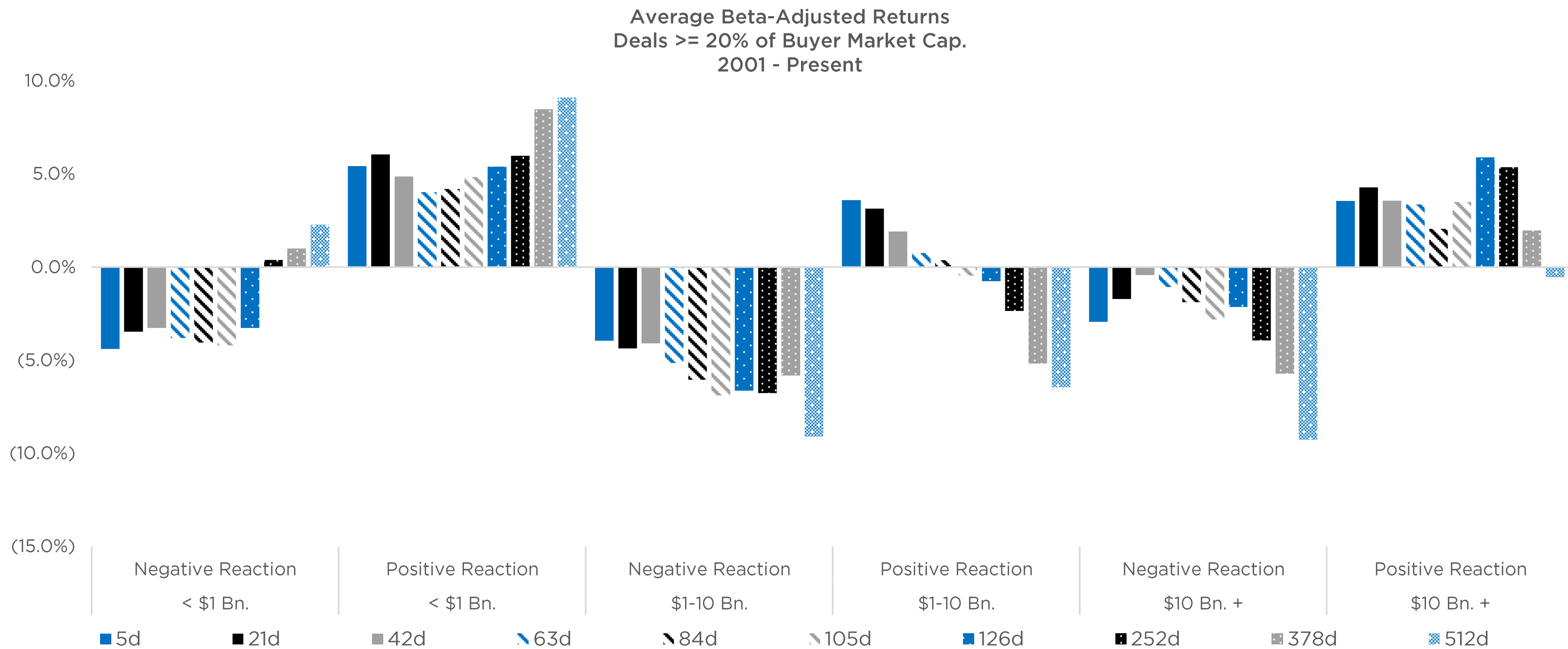
Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
BIIB	Biogen Inc.	Pharma Biotech	35.24
ATUS	Altice USA, Inc.	Media & Entertainment	7.36
KSS	Kohl's Corporation	Retailing	6.87
FL	Foot Locker, Inc.	Retailing	4.38
HLF	Herbalife Nutrition Ltd.	Household & Personal Prod.	4.18
ALSN	Allison Transmission Holdings, Inc.	Capital Goods	3.79
LOPE	Grand Canyon Education, Inc.	Consumer Services	3.40
NUS	Nu Skin Enterprises, Inc.	Household & Personal Prod.	2.53
WWW	Wolverine World Wide, Inc.	Consumer Durables & Apparel	2.37
SATS	EchoStar Corporation	Telecommunication Services	2.28
USNA	USANA Health Sciences, Inc.	Household & Personal Prod.	1.97
CMPR	Cimpress plc	Commercial & Professional Services	1.87
ATGE	Adtalem Global Education Inc.	Consumer Services	1.47
AMCX	AMC Networks Inc.	Media & Entertainment	1.46
INVA	Innoviva, Inc.	Pharma Biotech	1.20
PLCE	The Children's Place, Inc.	Retailing	1.14
CAL	Caleres, Inc.	Retailing	0.86
UVE	Universal Insurance Holdings, Inc.	Insurance	0.53

Mega or Large Cap High Quality Value Names That Bought Back 1% or More Shares End-December, 2021

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
MDLZ	Mondelez International, Inc.	Food, Beverage & Tobacco	92.50
YUM	Yum! Brands, Inc.	Consumer Services	40.70
AFL	Aflac Incorporated	Insurance	38.63
OTIS	Otis Worldwide Corporation	Capital Goods	36.98

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. On the left of the below exhibit we show performance over each horizon for acquiring companies less than $1 billion in market capitalization. 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 we show deals for companies bigger than $10 billion. The initial reaction carries the day for nearly 18 months if it is positive.



RECENT DEAL STOCKS WITH INITIAL / SUSTAINED POSITIVE REACTION

Select Recent Deals with Initial Positive Reaction
Buyer Market Cap. >= $500 mm.
December 31, 2021

Ticker	Company	Industry Group	Target Company	Announcement Date	Beta-Adjusted Return	Market Cap. (US$ Bil.)
DVN	Devon Energy Corporation	Energy	WPX Energy, Inc.	9/28/2020	336%	29.81
APO	Apollo Global Management, Inc.	Diversified Financials	Great Canadian Gaming Corporation	11/10/2020	36%	17.86
ALLY	Ally Financial Inc.	Diversified Financials	CardWorks, Inc.	2/18/2020	10%	16.49
KIM	Kimco Realty Corporation	Real Estate	Weingarten Realty Investors	4/15/2021	11%	15.19
CIVI	Civitas Resources, Inc.	Energy	Extraction Oil & Gas, Inc.	5/10/2021	11%	4.14
ARCB	ArcBest Corporation	Transportation	MoLo Solutions, LLC	9/29/2021	46%	3.06
CYRX	Cryoport, Inc.	Pharma Biotech	MVE Biological Solutions	8/25/2020	6%	2.92
CODI	Compass Diversified	Diversified Financials	Marucci Sports	3/9/2020	39%	2.02
MGPI	MGP Ingredients, Inc.	Food, Beverage & Tobacco	Luxco, Inc.	1/25/2021	32%	1.87

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)
December 31, 2021

Ticker	Company	Industry Group	Target Company	Announcement Date	Beta-Adjusted Return	Market Cap. (US$ Bil.)
SNX	TD SYNNEX Corporation	Technology Hardware & Equipment	Tech Data Corporation from Apollo Global Management, Inc.	3/22/2021	(18%)	10.98
PFGC	Performance Food Group Company	Food & Staples Retailing	Core-Mark Holding Company, Inc.	5/18/2021	(22%)	7.08
NFE	New Fortress Energy Inc.	Energy	Hygo Energy Transition Ltd	1/13/2021	(84%)	4.99
SAIC	Science Applications International Corporation	Software & Services	Unisys Federal from Unisys Corporation	2/6/2020	(57%)	4.76
ETRN	Equitrans Midstream Corporation	Energy	EQM Midstream Partners, LP	2/27/2020	(6%)	4.47
AHCO	AdaptHealth Corp.	Health Care Equipment & Services	AeroCare Holdings, Inc.	12/1/2020	(63%)	3.23
FTAI	Fortress Transportation and Infrastructure Investors LLC	Capital Goods	Transtar LLC	6/8/2021	(16%)	2.87
MSGE	Madison Square Garden Entertainment Corp.	Media & Entertainment	MSG Networks Inc.	3/26/2021	(38%)	2.41
GTN	Gray Television, Inc.	Media & Entertainment	Quincy Media, Inc.	2/1/2021	(15%)	1.90
DM	Desktop Metal, Inc.	Capital Goods	The ExOne Company	8/11/2021	(52%)	1.54
TWOU	2U, Inc.	Consumer Services	edX Inc.	6/29/2021	(64%)	1.51
KALU	Kaiser Aluminum Corporation	Materials	Alcoa Warrick LLC	11/30/2020	(10%)	1.48
ATGE	Adtalem Global Education Inc.	Consumer Services	Walden e-Learning, Inc.	9/11/2020	(44%)	1.47
PRA	ProAssurance Corporation	Insurance	NORCAL Mutual Insurance Company	2/20/2020	(65%)	1.37
PRIM	Primoris Services Corporation	Capital Goods	Future Infrastructure Holdings, LLC	12/14/2020	(43%)	1.29

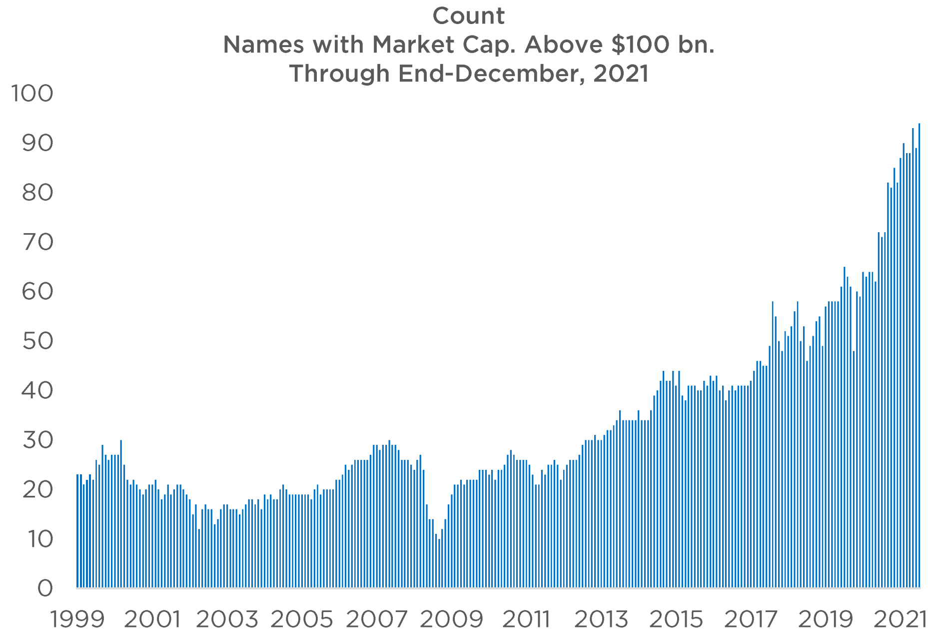
THE $100 BILLION MARKET CAPITALIZATION CLUB – THE NIFTY NINETY

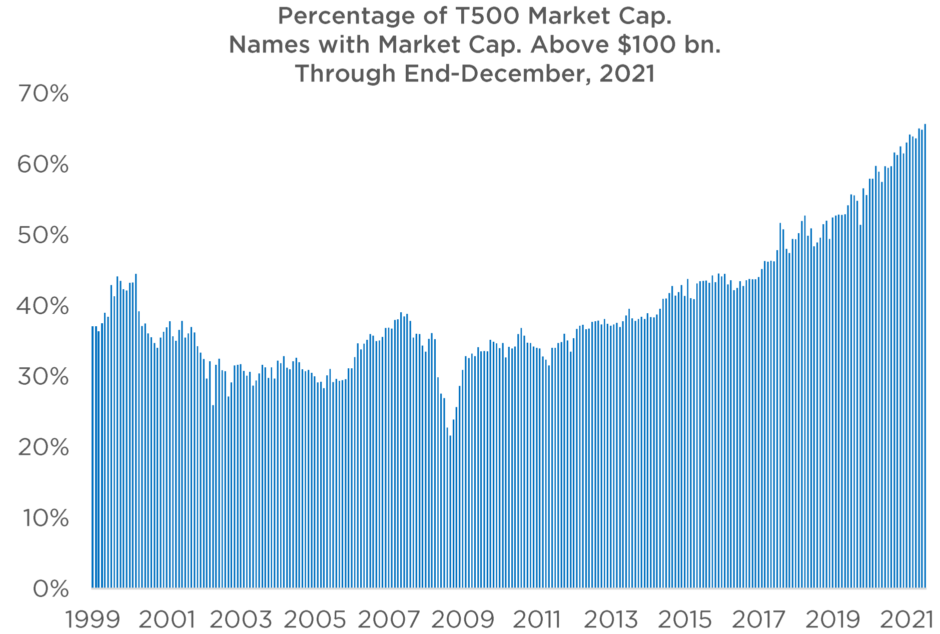
There are now 94 stocks greater than $100 billion market cap., more than 2x the number we had three years ago. This makes it increasingly challenging for generalist PMs to keep track of all of them. The group also has substantial alpha, and hence we wanted to provide ways for investors pick winners from losers. Our first approach is to evaluate the efficacy of our quantitative models, which we used to run live money at our prior venture, Trivariate Capital. Our approach is to forecast 18-month forward returns by first breaking the top 3000 US equities into 21 separate cohorts.   Using balance sheet, cash flow statement, income statement, valuation, sentiment, and accounting metrics, we build traditional statistical models designed to identify subsequent winners and losers through a ranking system. Our model has historically worked well on these stocks, with the top quintile (Q1) consistently and substantially beating the SP500, and the bottom quintile (Q5) consistently lagging the market. The $100 billion club overall modestly lags the market. As such, we think it make sense to use your quantitative model for idea generation in this Nifty Ninety group of stocks.

Following the assessment of our quant model, we looked for additional approaches to parse winners from losers. In total, we evaluated four additional methodologies to identify winners and losers in the $100 billion club including consensus sell-side recommendations, non-consensus buyside high conviction, share gain, and share loss. Stocks are shown here.

THE NUMBER OF STOCKS THAT ARE $100 BILLION CAP. HAS GROWN

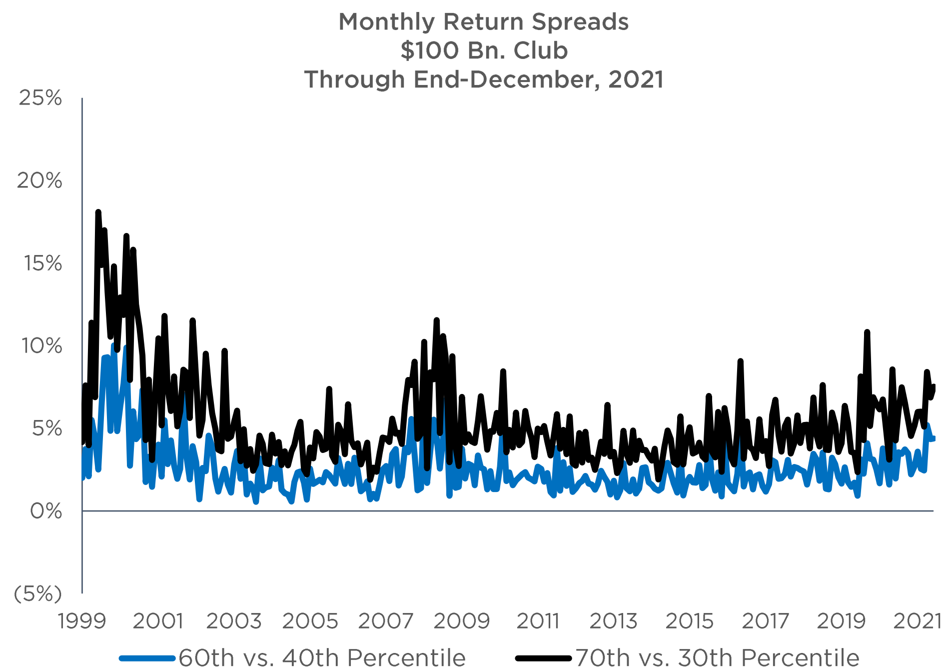
Ten year ago, there were roughly 30 companies in the US equity market that were greater than $100 bn. market capitalization. At that time, most generalist portfolio managers had formed investment views on these companies, had seen the management teams present or met them over the years, and had a pretty good command of the investment debates for nearly all of these companies.. Today, however, there are nearly 95 companies (left) that have greater than 100b market capitalization, double the number of companies that had reached this exclusive barrier three years ago. These names account for roughly 60% of the total market cap. of the SP500 (right). For any equity investor whose performance is directly benchmarked to the SP500, it has never been more important – and more challenging – to be able to generate performance from these names.

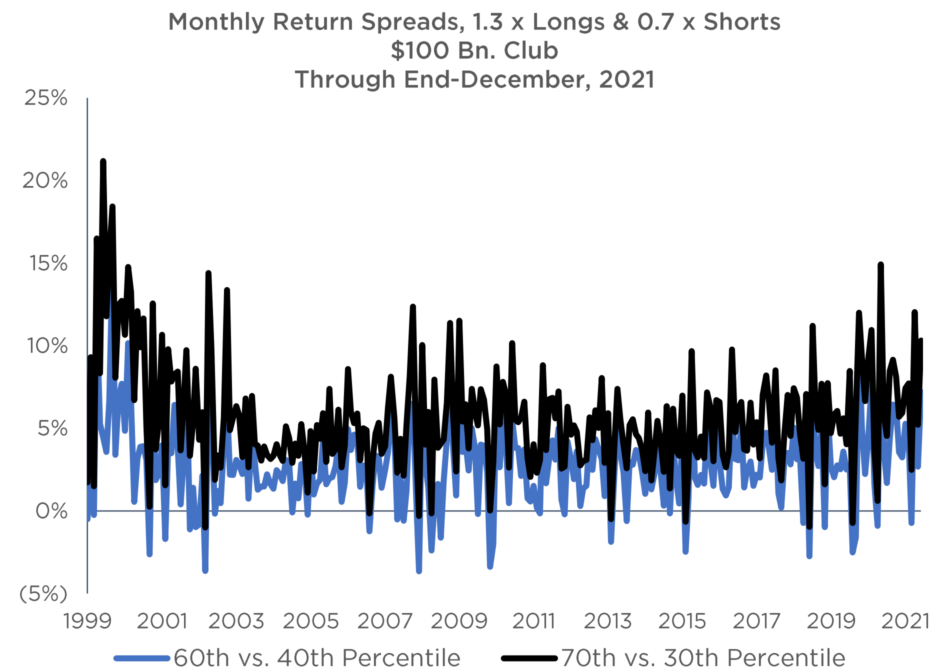




ALPHA POTENTIAL IN THIS GROUP IS REASONABLE

While conventional wisdom might say it is very difficult to generate alpha for mega cap stocks because they are well understood and covered, we wanted to dimension the potential alpha for this group before providing a time-saving, and alpha-generative framework for them. Below we show the annual performance potential of the 60th vs. 40th percentile and 70th vs. 30th percentile performers among the 100 billion club. By overweighting (or buying) stocks that perform in the 60th percentile of the group, and underweighting (shorting) stocks in the 40th percentile, the average performance is 2.6%. For a more skilled investors, getting 70th percentile overweight performance and 30th percentile underweight performance generates 5.5% performance in this group of large cap stocks (left). For hedge funds, who on average run with close to a 200% gross exposure and a 60% net exposure today, performance is 2.9% and 5.7% for 60-40 and 70-30 exposure (right) per month. Investors can do well in this group of stocks.

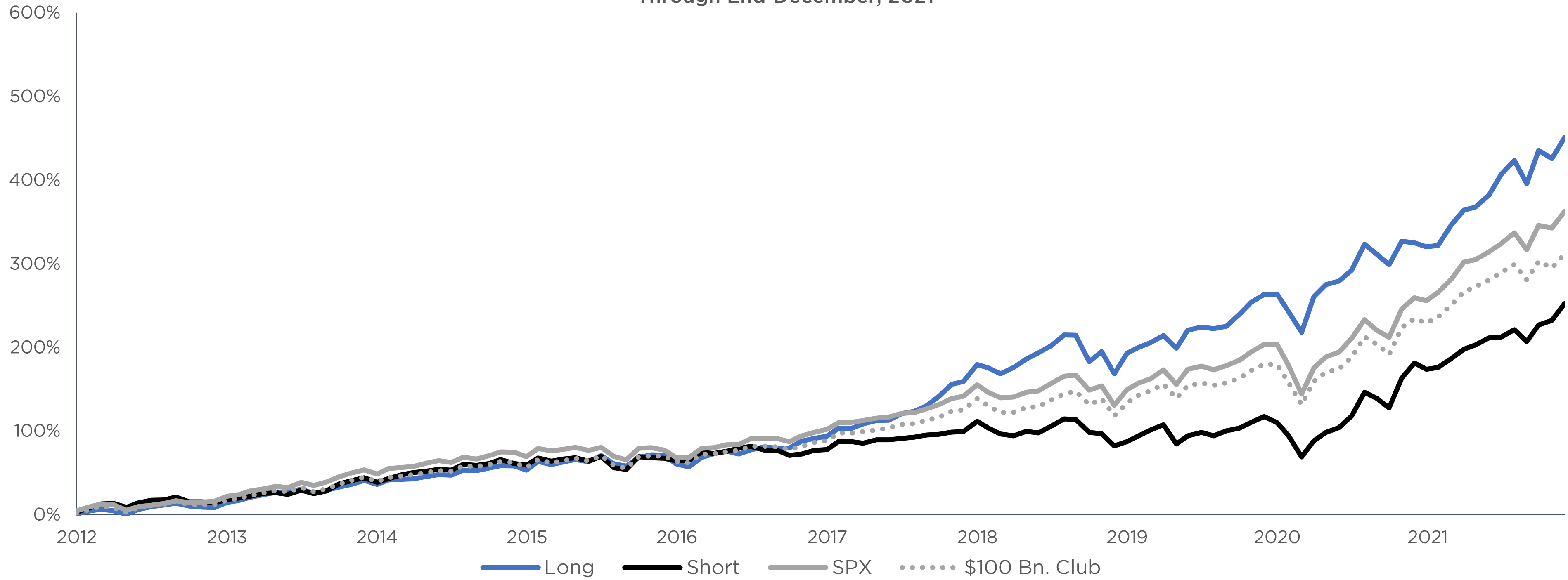




TRIVARIATE'S QUANTITATIVE MODEL DOES WELL ON $100B+ STOCKS

Given there is a huge group of stocks with some potential alpha, we wanted to provide ways for investors pick winners from losers. Our first approach is to evaluate the efficacy of our quantitative models, which we used to run live money at our prior venture, Trivariate Capital. Our approach is to forecast 18-month forward returns by first breaking the top 3000 US equities into 21 separate cohorts. Using balance sheet, cash flow statement, income statement, valuation, sentiment, and accounting metrics, we build traditional statistical models designed to identify subsequent winners and losers through a ranking system. Our model has historically worked well on these stocks, with the top quintile (Q1) consistently and substantially beating the SP500, and the bottom quintile (Q5) lagging the market. The $100 billion club overall modestly lags the market. As such, we think it make sense to use your quantitative model for idea generation in this Nifty Ninety group of stocks.

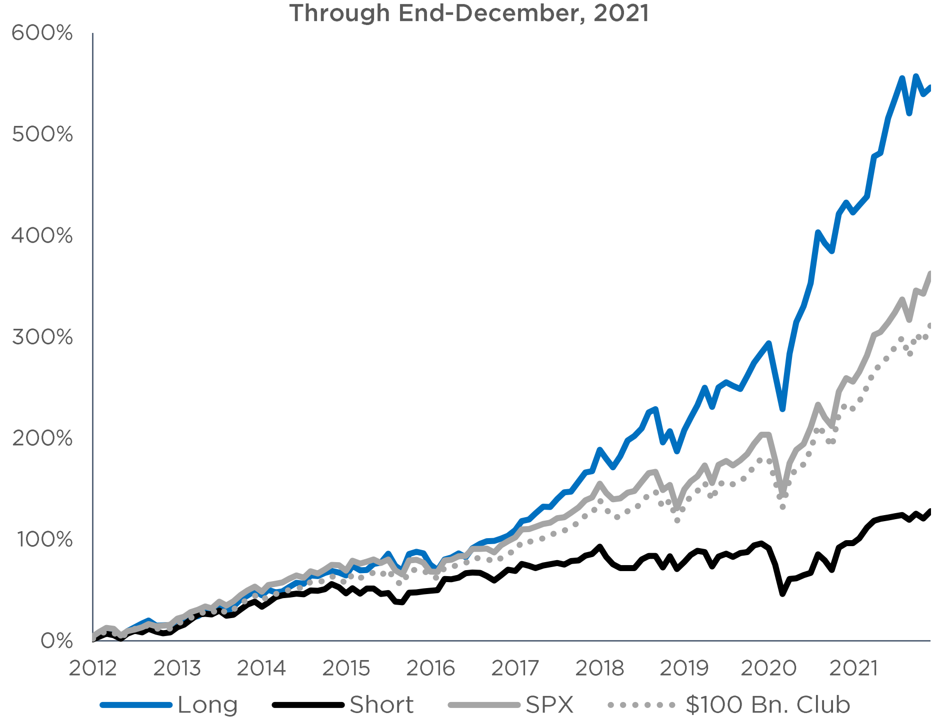
Average Monthly Returns
Trivariate Quantitative Model
Through End-December, 2021



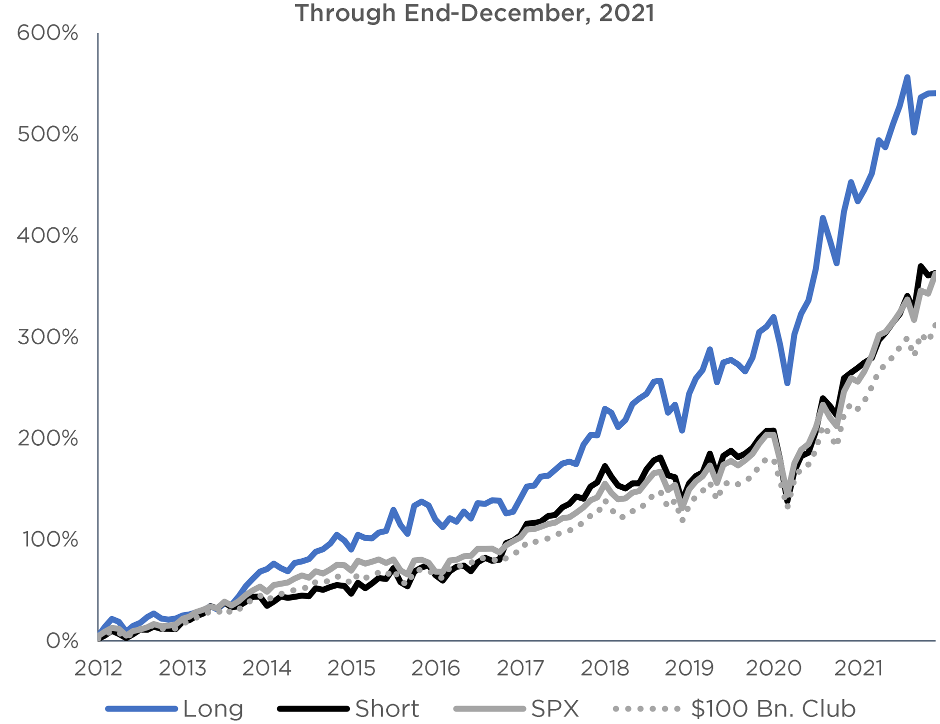
SURPRISINGLY SELL-SIDE AND BUY-SIDE CONSENSUS MATTERS

Following the assessment of our quant model, we looked for additional approaches to parse winners from losers. In total, we evaluated four additional methodologies to identify winners and losers in the $100 billion club. Firstly, we thought it makes sense to see if there is any value in the widely available sell-side analyst ratings. To our surprise, there was strong efficacy. Buying the stocks in the top quintile of the sell-side's aggregate recommendation and shorting those in the bottom quintile generated strong spread. It maybe be that there are underlying factors, like these grow faster, having expanding margins, have positive momentum, but for whatever the reason, it is clear this aggregate sell-side rating score is helpful (left chart). We also looked at the performance high conviction (3% or more of long AuM) of a select group of approximately 60 hedge fund managers that are not widely owned by 500 other funds. These tended to strongly outperform (right chart), whereas the stocks with little high conviction ownership from our select group of funds by lots of high conviction ownership from others performed more in-line.

Average Monthly Returns
Consensus Recommendation
Through End-December, 2021

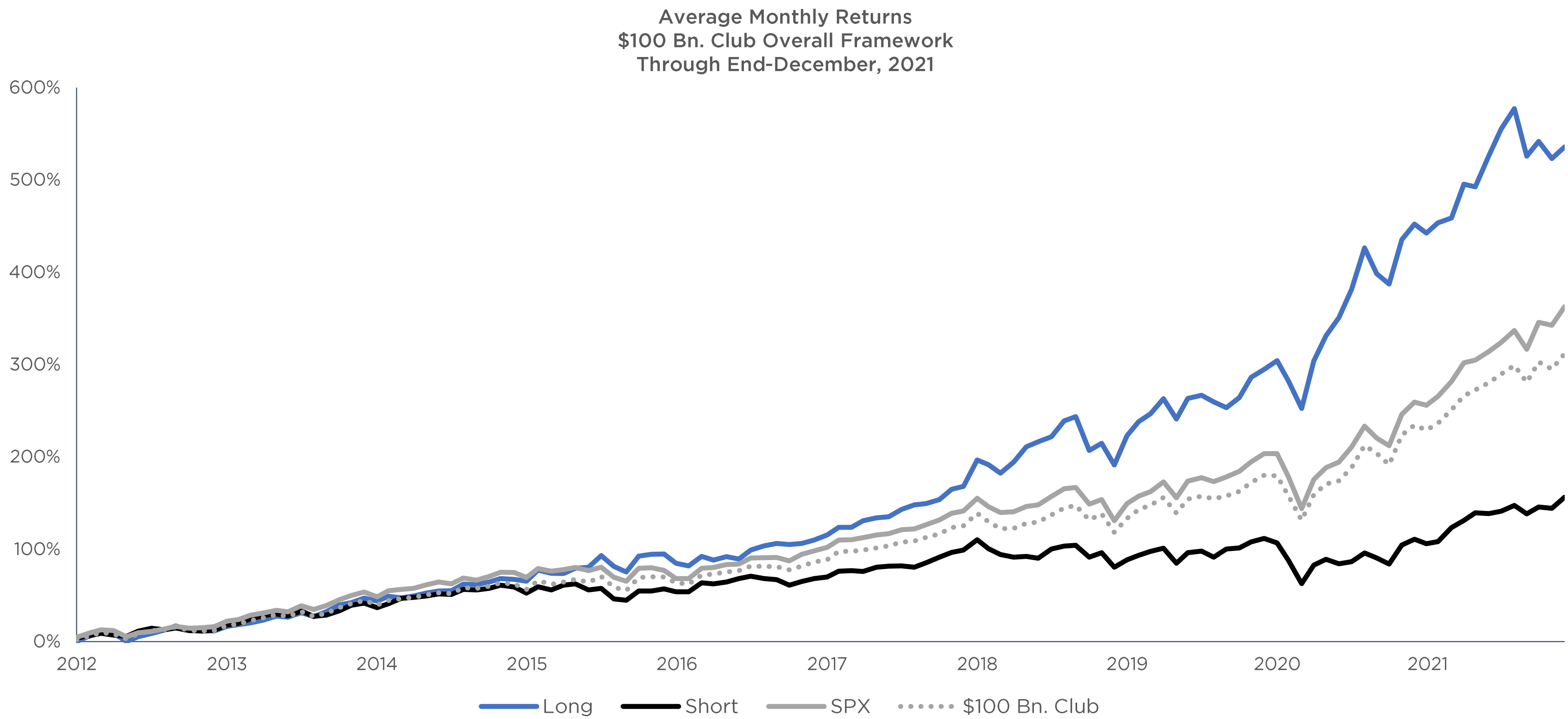


Average Monthly Returns
High Conviction & Non-Consensus vs. Opposite
Through End-December, 2021



OVERALL FRAMEWORK – AVERAGE ALL FIVE APPROACHES

When we take all five of the approaches (model rankings, consensus sell-side ratings, high conviction non-consensus views, forecasted revenue growth, forecasted gross margin expansion) and equal-weight the rank of each of the stocks that are $100 billion or larger and evaluate the subsequent return, we can see that those that are in the top quintile strongly beat the average and those in the bottom quintile strongly lag. We think this is a valuable approach to picking winners from losers among this group and that this has been particularly effective as the number of $100 billion cap. stocks has grown since 2016.



THE TOP THIRD IDEAS IN THE $100 BILLION CLUB

Stocks in the top third are shown below. There is clear bias toward large cap. technology today

Ideas in Top Third of $100 Bn. Club Framework, End-December 2021

Ticker	Company	Industry Group	Model Rank	Consensus Recommendation	Relative Forecast Share Gain	Relative Forecast Gross Margin Growth	High Conviction & Non-Consensus	Overall Framework Ranking
AMZN	Amazon.com, Inc.	Retailing	36	1	10	10	5	1
NOW	ServiceNow, Inc.	Software & Services	7	5	9	9	21	2
UNH	UnitedHealth Group Incorporated	Health Care Equip. & Serv.	3	11	38	38	2	3
CRM	salesforce.com, inc.	Software & Services	66	6	15	15	8	4
FB	Meta Platforms, Inc.	Media & Entertainment	14	7	18	18	4	5
GOOGL	Alphabet Inc.	Media & Entertainment	20	2	20	20	7	6
MA	Mastercard Incorporated	Software & Services	21	8	16	16	12	7
SNOW	Snowflake Inc.	Software & Services	32		1	1	14	8
PYPL	PayPal Holdings, Inc.	Software & Services	53	17	24	24		9
BLK	BlackRock, Inc.	Diversified Financials	9	26	19	19		10
BA	The Boeing Company	Capital Goods		52	5	5		11
RTX	Raytheon Technologies Corp.	Capital Goods	72	23	29	29		12
ADBE	Adobe Inc.	Software & Services	31	13	64	64	9	13
PM	Philip Morris International Inc.	Food, Bev. & Tobacco	22	43	35	35		14
MRK	Merck & Co., Inc.	Pharma Biotech	5	59	14	14		15
SHOP	Shopify Inc.	Software & Services	12	62	6	6	10	16
MRNA	Moderna, Inc.	Pharma Biotech	41	88	2	2		17
CAT	Caterpillar Inc.	Capital Goods	46	77	17	17		18
NEE	NextEra Energy, Inc.	Utilities		50.5	4	4		19
MSFT	Microsoft Corporation	Software & Services	48	3	71	71	6	20
AMT	American Tower Corporation	Real Estate	8	38.5	34	34		21
AXP	American Express Company	Diversified Financials	37	78	12	12		22
NFLX	Netflix, Inc.	Media & Entertainment	49	46	33	33	11	23
HD	The Home Depot, Inc.	Retailing	4	42	60	60	22.5	24
ISRG	Intuitive Surgical, Inc.	Health Care Equip. & Serv/	25	76	26	26		25
ABBV	AbbVie Inc.	Pharma Biotech	75	29.5	48	48		26
AMD	Advanced Micro Devices, Inc.	Semis & Semi Equipment		71	13	13	16.5	27
DHR	Danaher Corporation	Pharma Biotech	43	10	44	44	13	28
ANTM	Anthem, Inc.	Health Care Equip. & Serv.	10	14.5	39	39		29
TSLA	Tesla, Inc.	Autos & Components	70	84	3	3	18.5	30
GE	General Electric Company	Capital Goods	38	50.5	56	56	24.5	31

THE MIDDLE THIRD IDEAS IN THE $100 BILLION CLUB

Stocks in the middle third are shown below.

Ideas in Middle Third of $100 Bn. Club Framework, End-December 2021

Ticker	Company	Industry Group	Model Rank	Consensus Recommendation	Relative Forecast Share Gain	Relative Forecast Gross Margin Growth	High Conviction & Non-Consensus	Overall Framework Ranking
EL	The Estée Lauder Companies Inc.	House. & Personal Prod.	73	40	21	21		32
MDT	Medtronic plc	Health Care Equip. & Serv.	29	19	79	79		33
HON	Honeywell International Inc.	Capital Goods	13	74	52	52		34
LOW	Lowe's Companies, Inc.	Retailing	1	36	70	70	26.5	35
JNJ	Johnson & Johnson	Pharma Biotech	24	67	55	55		36
UNP	Union Pacific Corporation	Transportation		34	80	80	1	37
PFE	Pfizer Inc.	Pharma Biotech	26	79	7	7		38
WMT	Walmart Inc.	Food & Staples Retailing	34	24	54	54		39
TGT	Target Corporation	Retailing	11	35	53	53		40
V	Visa Inc.	Software & Services	54	4	49	49	36.5	41
SBUX	Starbucks Corporation	Consumer Services	45	66	78	78		42
LIN	Linde plc	Materials	62	20.5	43	43		43
CSCO	Cisco Systems, Inc.	Tech Hardware & Equip.	16	73	59	59		44
ZTS	Zoetis Inc.	Pharma Biotech	58	29.5	40	40		45
PEP	PepsiCo, Inc.	Food, Bev. & Tobacco	40	75	36	36		46
AMGN	Amgen Inc.	Pharma Biotech	30	83	68	68		47
MU	Micron Technology, Inc.	Semis & Semi Equipment	44	14.5	77	77	38	48
CVX	Chevron Corporation	Energy	28	44	31	31		49
CHTR	Charter Communications, Inc.	Media & Entertainment	35	70	85	85	20	50
ABNB	Airbnb, Inc.	Consumer Services	88		8	8	29.5	51
INTU	Intuit Inc.	Software & Services	71	18	42	42	26.5	52
TMUS	T-Mobile US, Inc.	Telecom Services	82	25	50	50	3	53
NKE	NIKE, Inc.	Consumer Durable & App.	77	20.5	75	75		54
BAC	Bank of America Corporation	Banks	55	69	27	27		55
KO	The Coca-Cola Company	Food, Bev. & Tobacco	74	49	37	37		56
MS	Morgan Stanley	Diversified Financials	19	55	63	63	24.5	57
NVDA	NVIDIA Corporation	Semis & Semi Equipment	89	12	11	11	36.5	58
BRK.B	Berkshire Hathaway Inc.	Diversified Financials	51	82	30	30		59
ACN	Accenture plc	Software & Services	6	47.5	73	73		60
C	Citigroup Inc.	Banks	18	47.5	51	51	32.5	61
PG	The Procter & Gamble Company	House. & Personal Prod.	33	72	45	45		62
TMO	Thermo Fisher Scientific Inc.	Pharma Biotech	60	9	69	69	16.5	63

THE BOTTOM THIRD IDEAS IN THE $100 BILLION CLUB

Stocks in the bottom third are shown below. There is clear bias against semiconductors and banks.

Ideas in Bottom Third of $100 Bn. Club Framework, End-December 2021

Ticker	Company	Industry Group	Model Rank	Consensus Recommendation	Relative Forecast Share Gain	Relative Forecast Gross Margin Growth	High Conviction & Non-Consensus	Overall Framework Ranking
LLY	Eli Lilly and Company	Pharma Biotech	50	59	81	81		64
AAPL	Apple Inc.	Tech. Hardware & Equip.	85	16	58	58		65
CVS	CVS Health Corporation	Health Care Equip. & Serv.	63	33	65	65		66
CMCSA	Comcast Corporation	Media & Entertainment	68	29.5	82	82		67
XOM	Exxon Mobil Corporation	Energy	64	87	23	23		68
SCHW	The Charles Schwab Corporation	Diversified Financials	57	59	25	25	18.5	69
SPGI	S&P Global Inc.	Diversified Financials	84	22	28	28	34	70
ABT	Abbott Laboratories	Health Care Equip. & Serv.	23	38.5	91	91	29.5	71
COST	Costco Wholesale Corporation	Food & Staples Retailing	15	56	32	32	29.5	72
VZ	Verizon Communications Inc.	Telecom Services	27	86	74	74		73
SYK	Stryker Corporation	Health Care Equip. & Serv.	67	63	57	57		74
PLD	Prologis, Inc.	Real Estate	52	45	90	90		75
T	AT&T Inc.	Telecom Services	47	85	88	88		76
JPM	JPMorgan Chase & Co.	Banks	42	64	72	72		77
DIS	The Walt Disney Company	Media & Entertainment	87	29.5	22	22	35	78
GS	The Goldman Sachs Group, Inc.	Diversified Financials	39	59	92	92		79
WFC	Wells Fargo & Company	Banks	69	59	76	76	15	80
DE	Deere & Company	Capital Goods	56	65	47	47		81
AVGO	Broadcom Inc.	Semis & Semi Equipment	81	27	67	67	22.5	82
MMM	3M Company	Capital Goods	17	91	66	66		83
IBM	International Business Machines	Software & Services	76	80	94	94		84
MCD	McDonald's Corporation	Consumer Services	61	32	83	83		85
AMAT	Applied Materials, Inc.	Semis & Semi Equipment	78	41	46	46	29.5	86
QCOM	QUALCOMM Incorporated	Semis & Semi Equipment	83	37	41	41	32.5	87
LRCX	Lam Research Corporation	Semis & Semi Equipment	80	54	61	61		88
BMY	Bristol-Myers Squibb Company	Pharma Biotech	79	53	62	62		89
INTC	Intel Corporation	Semis & Semi Equipment	2	90	93	93		90
TXN	Texas Instruments Incorporated	Semis & Semi Equipment	65	81	84	84		91
UPS	United Parcel Service, Inc.	Transportation		68	86	86		92
ADP	Automatic Data Processing, Inc.	Software & Services	59	92	87	87		93
ORCL	Oracle Corporation	Software & Services	86	89	89	89		94

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

ALL GOOD EXCEPT FINANCIAL CONDITIONS, CHINA, AND CURRENCY?

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 curve is bear flattening and the 12-month one is transitioning towards the same. Financial conditions are again. China has rolled over. The dollar is strengthening.

Current Regime for Each Macro Signal

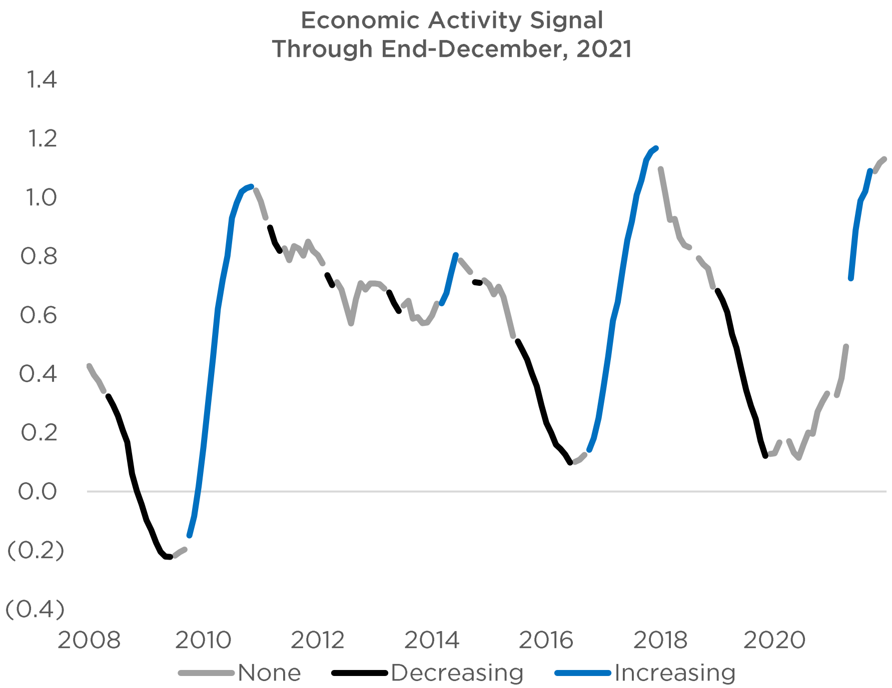
Macro Signal	Current Regime	Examples of Components
China	Decreasing	Fiscal Expenditures, New Auto Registrations, Electricity Consumption, Exports, Consumer Confidence, Financial Conditions, Residential Property Sales, 10-Year Yield
Commodities	Increasing	Aluminum, Corn, Cotton, Copper, Lumber, Natural Gas, Soybeans, Sugar, Silver
Consumer Activity	Increasing	Credit Card Delinquency, Retail Sales, Consumer Confidence, Wage Growth, Unemployment
Corporate Profitability	Increasing	Operating Margin, 1-Year FWD Earnings Expectations, 2-Year FWD Earnings Expectations
Company-Specific Risk	Increasing (More Idiosyncratic, Less Macro)	The amount unexplained by our 7-factor model
Currency	Dollar Strengthening	AUD, CAD, CHF, DXY, EUR, GBP, INR, JPY, SEK
Economic Activity	None	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	None	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	None	US 2-Year Yield, US 10-Year Yield
Yield Curve 126d	Bear Flattening	US 2-Year Yield, US 10-Year Yield
Yield Curve 252d	None	US 2-Year Yield, US 10-Year Yield

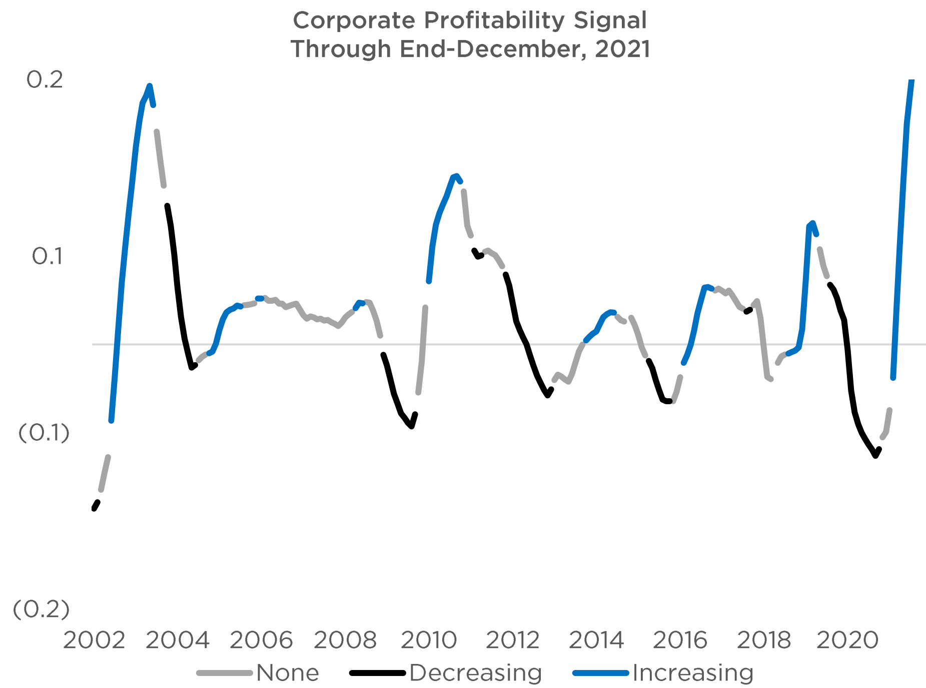
WHAT SHOULD WE DO ABOUT IT?

1. We recommend that investors **gross down their durables exposure.** We struggle to separate winners from losers in durables like homebuilders, air conditioners, and select durable apparel when corporate profitability is positive and increasing
2. We recommend that investors **gross up their consumer discretionary exposure.** Our consumer discretionary model performs better when our consumer activity gauge is positive and increasing and when company-specific risk is rising in the consumer sector
3. Other recommendations include: **gross up exposure to healthcare, energy and materials, industrials, and non-growth "junk" stocks**

ECONOMIC ACTIVITY FLATTENED, CORPORATE GAUGE STILL STRONG

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. This month the gauge moderated (left chart). Our corporate profitability gauge consists of current operating margins and forward earnings expectations (relative to current) for the fiscal years 1 and 2 years into the future. Our corporate profitability signal overall is at a high (right chart).





OTHER PROCESS FOR GROSS EXPOSURE RECOMMENDATIONS

Our durables model performs poorly when corporate profitability is increasing, fueling our judgment that picking winners from losers is challenging in areas like home builders, air conditioning, and select apparel today. The top quintile of our durables model UNDERPERFORMS the bottom quintile by 2.4% on average when corporate profitability is increasing but outperforms the bottom quintile by 8.2% when it is not increasing (left chart). Another illustration is our economic activity gauge. It recently stopped increasing, causing us to change our gross exposure recommendation for TMT, but the power of our quantitative model for TMT stocks when economic activity is increasing is substantial (right chart).

Durables Model Performance Through End-December, 2021

Stat (Beta-Adjusted)	Corporate Profitability Increasing	Corporate Profitability Not Increasing	Difference
Weighted Mean	(2.4%)	8.2%	(10.6%)
Weighted Median	(4.6%)	10.6%	(15.2%)
Weighted Information Ratio	(0.22)	0.69	(0.92)
Hit Rate	41.7%	62.7%	(21.1%)

TMT Model Performance Through End-December, 2021

Stat (Beta-Adjusted)	Economic Activity Increasing	Economic Activity Not Increasing	Difference
Weighted Mean	16.4%	7.6%	8.8%
Weighted Median	16.8%	6.1%	10.7%
Weighted Information Ratio	1.87	0.83	1.05
Hit Rate	67.6%	55.2%	12.5%

IF RISKS DID NOT CHANGE, ANYONE COULD DO RISK MANAGEMENT

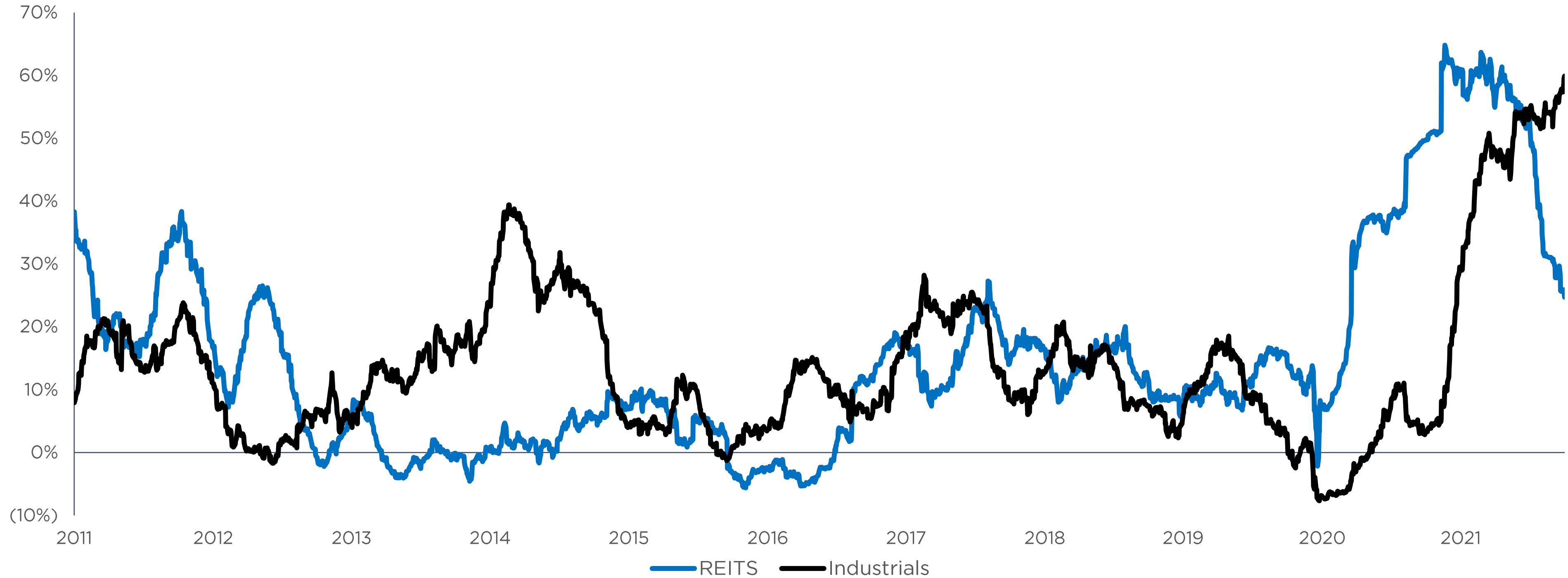
Six key risks worth monitoring:

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.
5. **Inflation:** We recommend looking at the correlation of every stock in your portfolio to an inflation basket (contact us if you want access to our inflation basket) to monitor exposure.
6. **Crypto**: With crypto now being updated on networks as much as the SP500 we wrote a note assessing it as a risk. There is a statistically significant relationship between our crypto basket's performance and our beta-adjusted inflation basket and our hyper growth junk universe meaning that crypto is part speculation, part hedge on the the potential long-term devaluation of fiat currencies driving inflation. It is a risk worth monitoring.

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). However, right after the Pfizer vaccine announcement on November 9th of 2020, the average pairwise correlation of our REITs-model signals jumped to near 70% as REITs names rose indiscriminately – that has begun to materially moderate however over the last six months. However, high signal correlation in the industrials model have continued to persist.

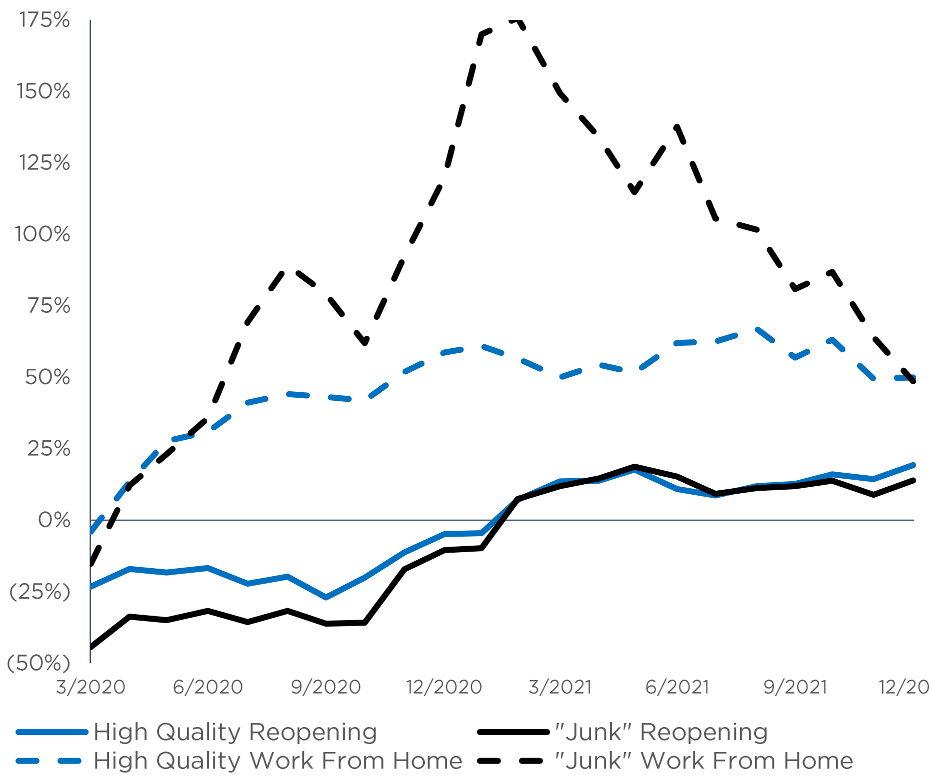
REITS and Industrials Cohort Model
Average 21-Day Pairwise Correlation
Through End-December, 2021



RISK TWO: JUNK WORK FROM HOME VS. QUALITY REOPENING

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). In our minds, high quality reopening names seem poised for incremental catch up, and junk “work from home” ideas could continue to lag (right exhibit for ideas).

Compounded Median Return
Reopening vs. Work-from-Home, High Quality vs. Junk
Through End-December, 2021



Buy High Quality Reopening, Sell “Junk” Work-from-Home
Names in Top/Bottom Model Quartile with Market Cap. of at least $1 Bil.
End-December, 2021

Long

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
LEVI	Levi Strauss & Co.	Textiles, Apparel & Luxury Goods	10.06
UGI	UGI Corporation	Gas Utilities	9.61
ATKR	Atkore Inc.	Electrical Equipment	5.15
SCHL	Scholastic Corporation	Media	1.38
PFC	Premier Financial Corp.	Thrifts & Mortgage Finance	1.14

Short

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
PTON	Peloton Interactive, Inc.	Leisure Products	11.81
SAM	The Boston Beer Company, Inc.	Beverages	6.16
BYND	Beyond Meat, Inc.	Food Products	4.13
MARA	Marathon Digital Holdings, Inc.	Software	3.37
LMND	Lemonade, Inc.	Insurance	2.6
ARRY	Array Technologies, Inc.	Electrical Equipment	2.12
CANO	Cano Health, Inc.	Health Care Providers & Services	1.61
BLFS	BioLife Solutions, Inc.	Health Care Equipment & Supplies	1.55
GENI	Genius Sports Limited	Interactive Media & Services	1.52
VRM	Vroom, Inc.	Specialty Retail	1.48
HYFM	Hydrofarm Holdings Group, Inc.	Machinery	1.26

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-December, 2021

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
WMT	Walmart Inc.	Food & Staples Retailing	401.35
PFE	Pfizer Inc.	Pharmaceuticals	331.44
COST	Costco Wholesale Corporation	Food & Staples Retailing	251.74
ORCL	Oracle Corporation	Software	232.89
VZ	Verizon Communications Inc.	Diversified Telecommunication Services	218.12
TGT	Target Corporation	Multiline Retail	110.89
EW	Edwards Lifesciences Corporation	Health Care Equipment & Supplies	80.88
PSA	Public Storage	Equity Real Estate Investment Trusts (REITs)	65.68
DLR	Digital Realty Trust, Inc.	Equity Real Estate Investment Trusts (REITs)	50.19
ORLY	O'Reilly Automotive, Inc.	Specialty Retail	47.59
CTSH	Cognizant Technology Solutions Corporation	IT Services	46.6
WBA	Walgreens Boots Alliance, Inc.	Food & Staples Retailing	45.06
AZO	AutoZone, Inc.	Specialty Retail	43.26
EFX	Equifax Inc.	Professional Services	35.72
AVB	AvalonBay Communities, Inc.	Equity Real Estate Investment Trusts (REITs)	35.24
EQR	Equity Residential	Equity Real Estate Investment Trusts (REITs)	33.94
PCG	PG&E Corporation	Electric Utilities	24.1
K	Kellogg Company	Food Products	21.98
CLX	The Clorox Company	Household Products	21.42
CPT	Camden Property Trust	Equity Real Estate Investment Trusts (REITs)	18.26
ELS	Equity LifeStyle Properties, Inc.	Equity Real Estate Investment Trusts (REITs)	16.11
EVRG	Evergy, Inc.	Electric Utilities	15.73
CTRA	Coterra Energy Inc.	Oil, Gas & Consumable Fuels	15.46
LSI	Life Storage, Inc.	Equity Real Estate Investment Trusts (REITs)	12.54
ERIE	Erie Indemnity Company	Insurance	8.9
DNB	Dun & Bradstreet Holdings, Inc.	Professional Services	8.84
SWN	Southwestern Energy Company	Oil, Gas & Consumable Fuels	4.73

RISK FOUR: NEGATIVE ASYMMETRIC BETA

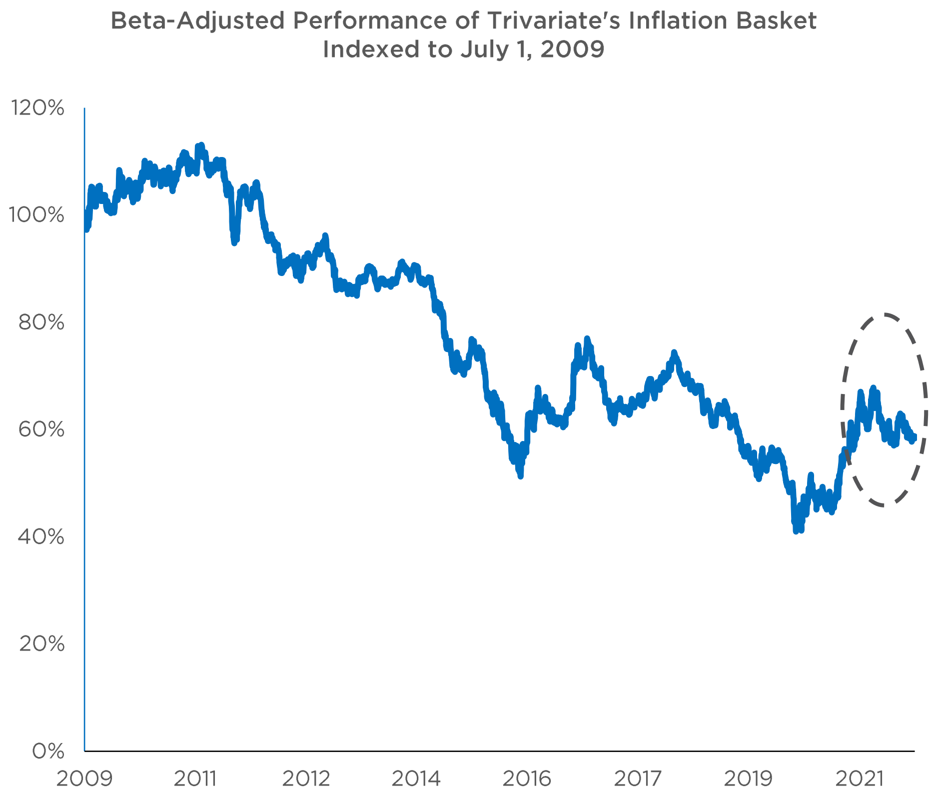
We analyzed the beta of stocks during periods where the market is down 10% or more. 43% of stocks with the highest negative asymmetric betas are REITS (left side). Non-REITs are shown on the right. This list represents names where we expect high underperformance in a market drawdown.

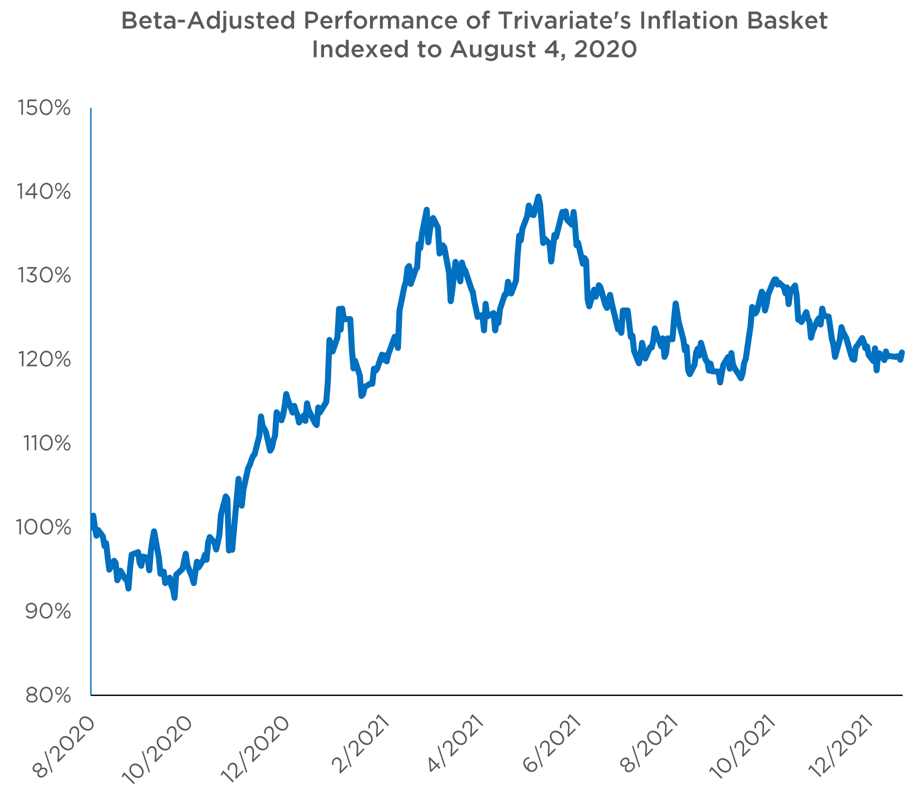
Names with Higher 252d Betas During SPX Drawdowns of at Least 10%
End-December, 2021

REITs				Non-REITs			
Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)	Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
PSA	Public Storage	REITs	65.68	CME	CME Group Inc.	Capital Markets	82.11
SPG	Simon Property Group, Inc.	REITs	52.5	ICE	Intercontinental Exchange, Inc.	Capital Markets	77.06
DLR	Digital Realty Trust, Inc.	REITs	50.19	TWLO	Twilio Inc.	IT Services	46.96
SBAC	SBA Communications Corporation	REITs	42.32	LEN	Lennar Corporation	Household Durables	35.18
O	Realty Income Corporation	REITs	40.51	NDAQ	Nasdaq, Inc.	Capital Markets	35.12
AVB	AvalonBay Communities, Inc.	REITs	35.24	LYV	Live Nation Entertainment, Inc.	Entertainment	26.36
ARE	Alexandria Real Estate Equities, Inc.	REITs	34.55	YUMC	Yum China Holdings, Inc.	Hotels, Restaurants & Leisure	21.34
EQR	Equity Residential	REITs	33.94	MKTX	MarketAxess Holdings Inc.	Capital Markets	15.64
EXR	Extra Space Storage Inc.	REITs	30.36	TDOC	Teladoc Health, Inc.	Health Care Technology	14.7
MAA	Mid-America Apartment Communities, Inc.	REITs	26.42	DECK	Deckers Outdoor Corporation	Textiles, Apparel & Luxury Goods	10.05
ESS	Essex Property Trust, Inc.	REITs	22.93	GPK	Graphic Packaging Holding Company	Containers & Packaging	5.99
PEAK	Healthpeak Properties, Inc.	REITs	19.46	EXLS	ExlService Holdings, Inc.	IT Services	4.82
UDR	UDR, Inc.	REITs	18.55	SNDR	Schneider National, Inc.	Road & Rail	4.78
CPT	Camden Property Trust	REITs	18.26	MTH	Meritage Homes Corporation	Household Durables	4.55
BXP	Boston Properties, Inc.	REITs	17.99	CIVI	Civitas Resources, Inc.	Oil, Gas & Consumable Fuels	4.14
ELS	Equity LifeStyle Properties, Inc.	REITs	16.11	AYX	Alteryx, Inc.	Software	4.08
KIM	Kimco Realty Corporation	REITs	15.19	RDN	Radian Group Inc.	Thrifts & Mortgage Finance	3.79
LSI	Life Storage, Inc.	REITs	12.54	ALKS	Alkermes plc	Biotechnology	3.76
NNN	National Retail Properties, Inc.	REITs	8.44	NNI	Nelnet, Inc.	Consumer Finance	3.74

RISK FIVE: INFLATION EXPOSURE MATTERS

The consensus view on inflation has totally changed over the last few months. When we initiated our product in May, the overwhelming consensus was that the 10-year yield would rise. After it “surprisingly” fell the consensus completely reversed, right around the time the 10-year yield bottomed. Our general sense is that most investors think the 10-year yield will back up in the next six months, but that it will be constrained on the upside after that – we think monitoring inflation exposure is important.





RISK SIX: CRYPTO SOMETHING TO START MONITORING

The tighter association of our crypto basket's returns to the SP500 since COVID motivated us to analyze whether there was any statistically significant relationship between its performance and our beta-adjusted inflation basket (in blue) and our hyper growth junk universe (in black) below. Both had virtually zero relationship until COVID, and both now have some statistical significance, above and beyond other factors. In our judgment, a logical conclusion is that crypto is part speculation, part hedge on the potential long-term devaluation of fiat currencies driving inflation. We think it will be interesting to monitor this trend going forward, as the massive government stimulus following COVID certainly renewed fears that ultimate rampant inflation is a possibility.

Rolling 252-Day T-Statistic
Crypto Index to Inflation and Hyper Growth Junk
Through End-December, 2021

TRIVARIATE SECTOR OVERVIEW: SUMMARY RECOMMENDATIONS

Our sector recommendations are shown here- obviously 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

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	1,013.30	2.2%	6.0%	3.8%	Maximum Overweight	Buy the cheap stocks with upward revisions
Energy	1,080.85	2.4%	6.0%	3.6%	Maximum Overweight	Oil is rising, and M&A is likely
Health Care	5,612.51	12.4%	15.0%	2.6%	Overweight	Healthcare services have cheap growth, and the biotechnology sell-off appears over-done
Consumer Discretionary	5,928.37	13.1%	15.0%	1.9%	Overweight	Retailing, reopening, and services better than durables
Utilities	961.08	2.1%	3.0%	0.9%	Equal-Weight	Some idiosyncratic investments are sensible
Communication Services	4,863.96	10.8%	12.0%	1.2%	Equal-Weight	Makes sense to keep market-weight FAANGM
Financials	4,803.44	10.6%	10.0%	(0.6%)	Equal-Weight	Large cap banks better than regionals, but excess capacity and excessive optimism about rates are a problem
Real Estate	1,153.31	2.6%	1.0%	(1.6%)	Under-Weight	Commercial real-estate is challenged
Information Technology	13,659.40	30.2%	27.0%	(3.2%)	Under-Weight	Semis are over-earning, focus on margin expansion / cash flow generation
Consumer Staples	2,762.18	6.1%	2.0%	(4.1%)	Under-Weight	Plenty of short ideas in idiosyncratic staples, and valuation of large-caps is stretched
Industrials	3,335.41	7.4%	3.0%	(4.4%)	Maximum Underweight	Industrial activity is rolling over, but earnings expectation are very high

CAN YOU STILL OWN ENERGY & MATERIALS?

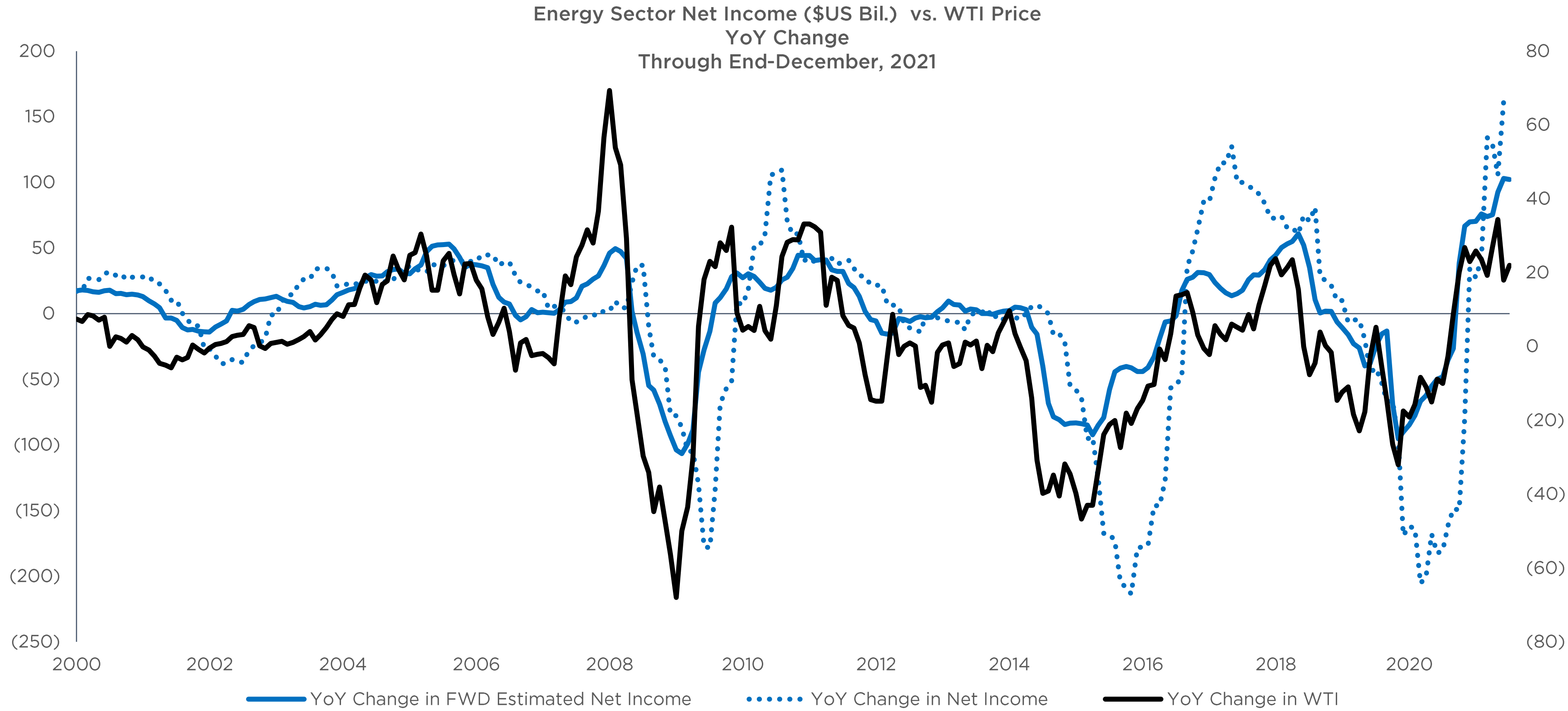
Oil was up over 10% in December, after a risk-off sell-off in November. We do not observe change in the supply /demand dynamic and remain bullish on energy stocks.

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. Moreover, when the dollar is strengthening, our ability to pick winners from losers in energy and materials is enhanced. 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 see record profitability next year, **yet valuation is at 18-year lows vs. the market excluding materials**. 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 in the coming year.

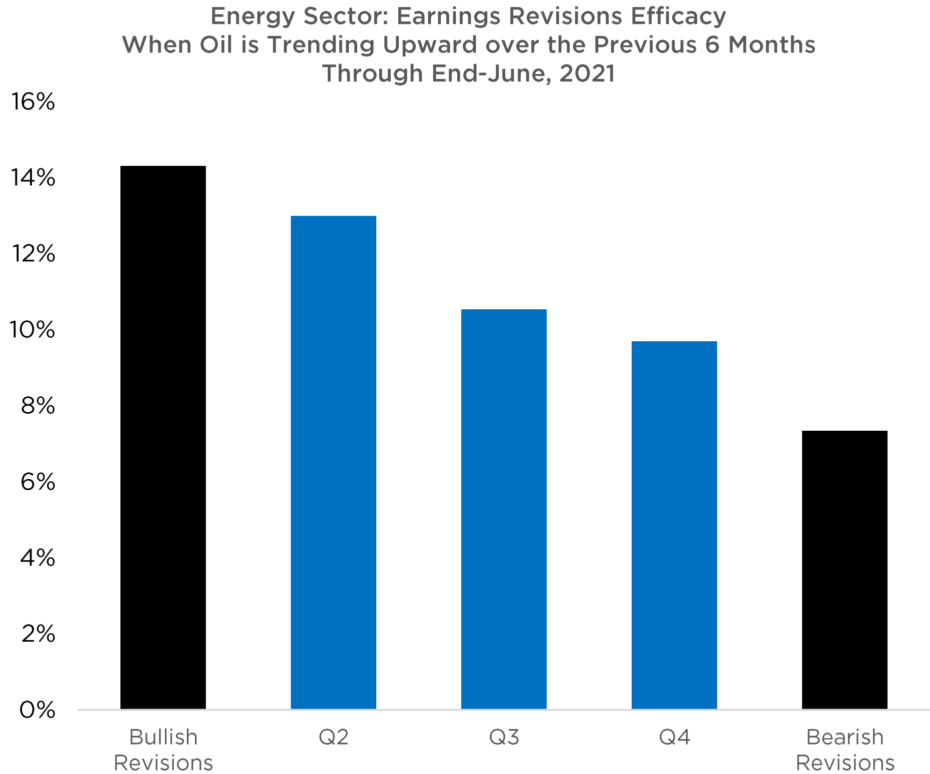
THERE IS A LAG BETWEEN OIL PRICES, ESTIMATES, AND REPORTS

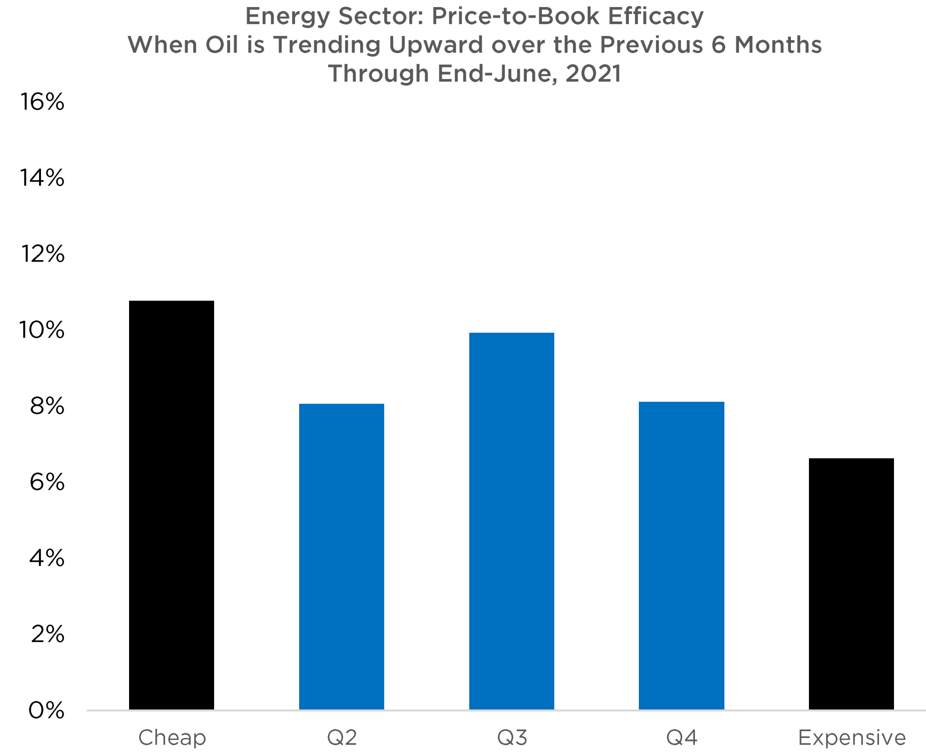
For energy, oil prices are a leading indicator for net income of the energy sector. The black line below shows the change in WTI , which is typically a 3-to-6-month leading indicator for the dashed blue line, which is reported net income. The analysts typically wait until after oil lags (solid blue line),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



USE ENERGY EARNINGS REVISIONS & VALUATION WHEN OIL IS RISING

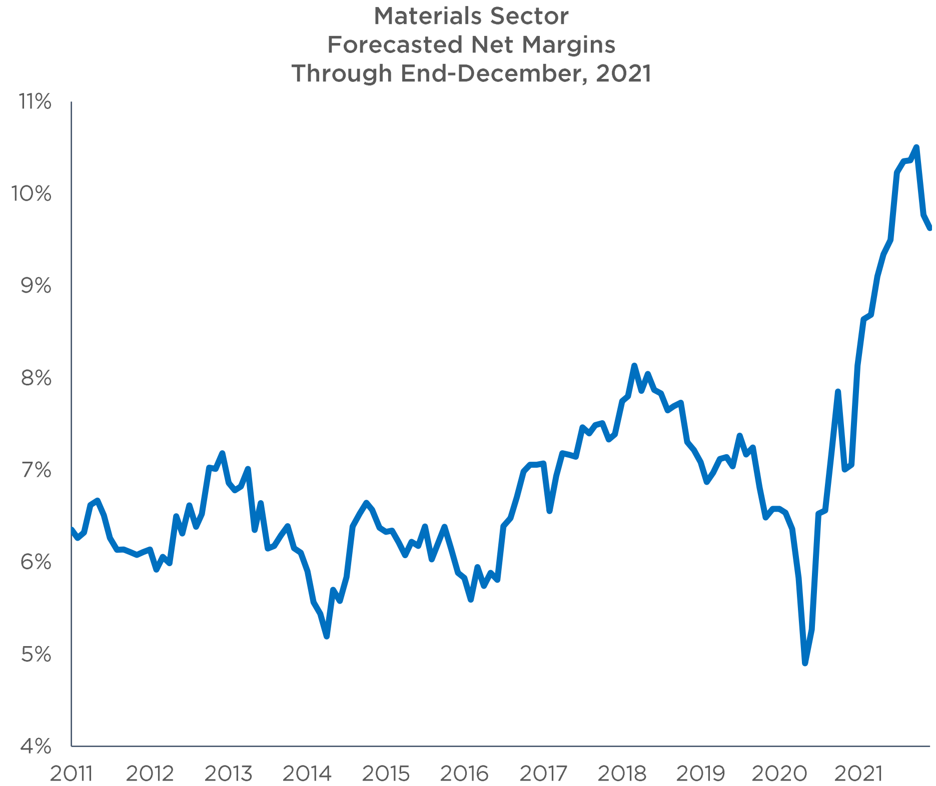
We analyzed whether earnings revisions were efficacious at predicting subsequent energy sector returns when oil is rising. Given that stock prices are typically anticipatory, we have received several questions about how much more energy stocks could rally. During a rising oil regime, analyst earnings 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 Q on price-to-book outperforms the most expensive by ~5%.





THE MARKET IS SKEPTICAL OF RECORD MATERIALS PROFIT ESTIMATES

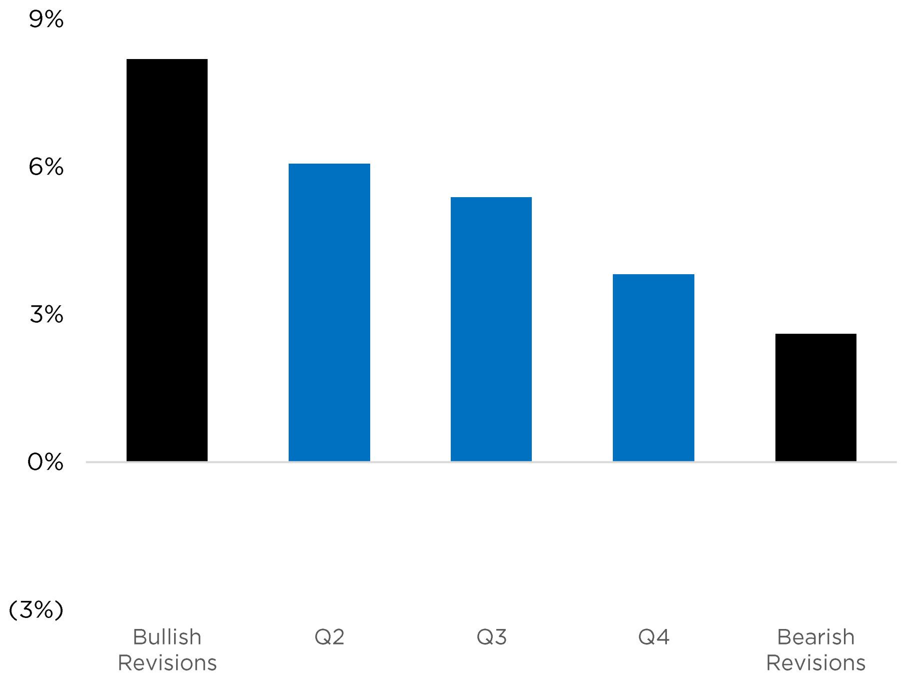
The consensus expectations are that net margins for the materials sector will achieve record highs, and then dramatically roll-over, yet the valuation on a relative to the market basis has barely moved above 18-year lows. Our belief is that many of the companies structurally improved cycle to cycle, 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.



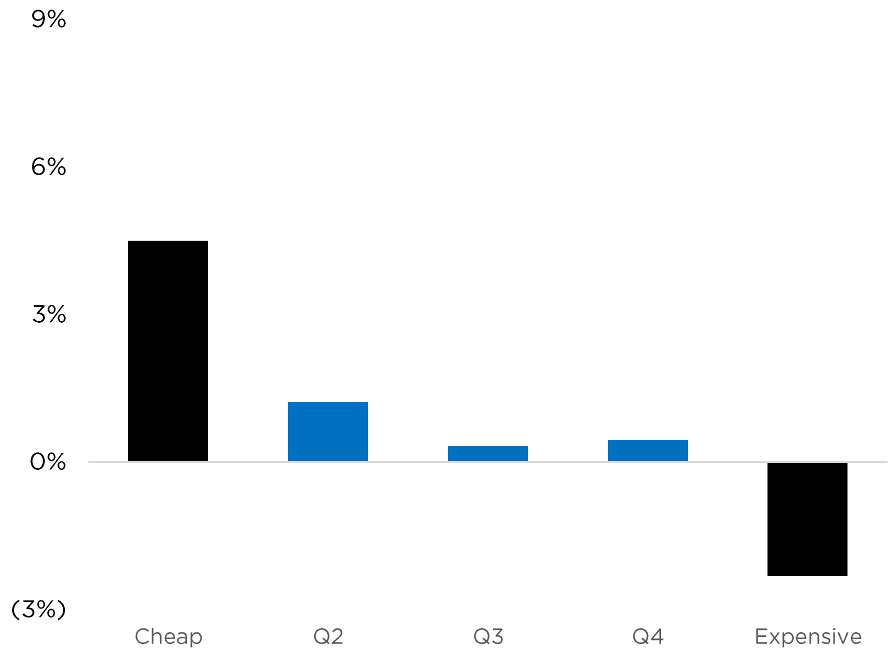
EARNINGS REVISIONS & VALUATION WORK FOR MATERIALS

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.

Materials Sector: Earnings Revisions Efficacy When Oil is Trending Upward over the Previous 6 Months Through End-June, 2021



Materials Sector: EV-to-EBITDA Efficacy When Oil is Trending Upward over the Previous 6 Months Through End-June, 2021



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-December, 2021

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
DOW	Dow Inc.	Chemicals	41.95
NUE	Nucor Corporation	Metals & Mining	31.08
LYB	LyondellBasell Industries N.V.	Chemicals	30.48
MOS	The Mosaic Company	Chemicals	14.89
WLK	Westlake Chemical Corporation	Chemicals	12.42
STLD	Steel Dynamics, Inc.	Metals & Mining	12.32
AA	Alcoa Corporation	Metals & Mining	11.15
CLF	Cleveland-Cliffs Inc.	Metals & Mining	10.89
RS	Reliance Steel & Aluminum Co.	Metals & Mining	10.16
OLN	Olin Corporation	Chemicals	9.17
EQT	EQT Corporation	Oil, Gas & Consumable Fuels	8.24
LPX	Louisiana-Pacific Corporation	Paper & Forest Products	6.89
X	United States Steel Corporation	Metals & Mining	6.43
NOV	NOV Inc.	Energy Equipment & Services	5.29
CMC	Commercial Metals Company	Metals & Mining	4.41
MUR	Murphy Oil Corporation	Oil, Gas & Consumable Fuels	4.03
CBT	Cabot Corporation	Chemicals	3.19
GEF	Greif, Inc.	Containers & Packaging	2.92
CNX	CNX Resources Corporation	Oil, Gas & Consumable Fuels	2.9
TSE	Trinseo PLC	Chemicals	2.04
CDEV	Centennial Resource Development, Inc.	Oil, Gas & Consumable Fuels	1.7
PBF	PBF Energy Inc.	Oil, Gas & Consumable Fuels	1.56
KRA	Kraton Corporation	Chemicals	1.49
SCHN	Schnitzer Steel Industries, Inc.	Metals & Mining	1.44
ASIX	AdvanSix Inc.	Chemicals	1.33
RFP	Resolute Forest Products Inc.	Paper & Forest Products	1.19
AMR	Alpha Metallurgical Resources, Inc.	Metals & Mining	1.12
NEXA	Nexa Resources S.A.	Metals & Mining	1.04
RYI	Ryerson Holding Corporation	Metals & Mining	1
PUMP	ProPetro Holding Corp.	Energy Equipment & Services	0.84
MERC	Mercer International Inc.	Paper & Forest Products	0.79
TMST	TimkenSteel Corporation	Metals & Mining	0.76
BRY	Berry Corporation	Oil, Gas & Consumable Fuels	0.67
WTTR	Select Energy Services, Inc.	Energy Equipment & Services	0.59
OIS	Oil States International, Inc.	Energy Equipment & Services	0.31

OPPORTUNITIES IN THE HEALTHCARE SECTOR

1. The biotechnology sell-off now appears too extreme, with forecasted sales growth 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.

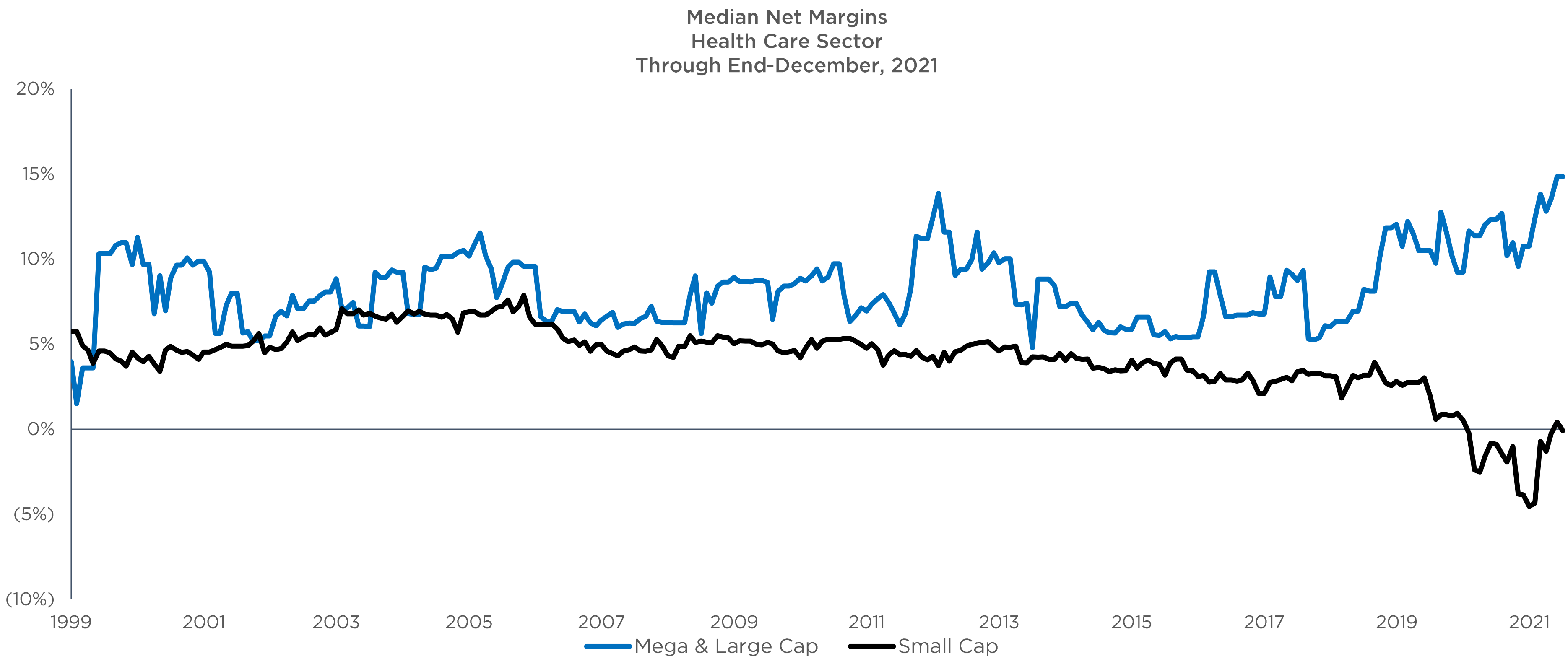
2. Healthcare providers and services companies remain the cheapest industry within healthcare, with relative multiple contraction over the last five years, while all the other healthcare industry groups experienced relative multiple expansion on price-to-forward earnings. Interestingly, this contraction 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. Life sciences and tools stocks had the highest gross margin expansion in 2021, likely driving them to perform best among the healthcare industries. We continue to think the market will reward gross margin expansion as businesses that can offset rising input costs and beat margin expectations will likely outperform in 2022.

4. 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, with staples ripping in December and leaving mega /large biotech / pharma at 59% 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.

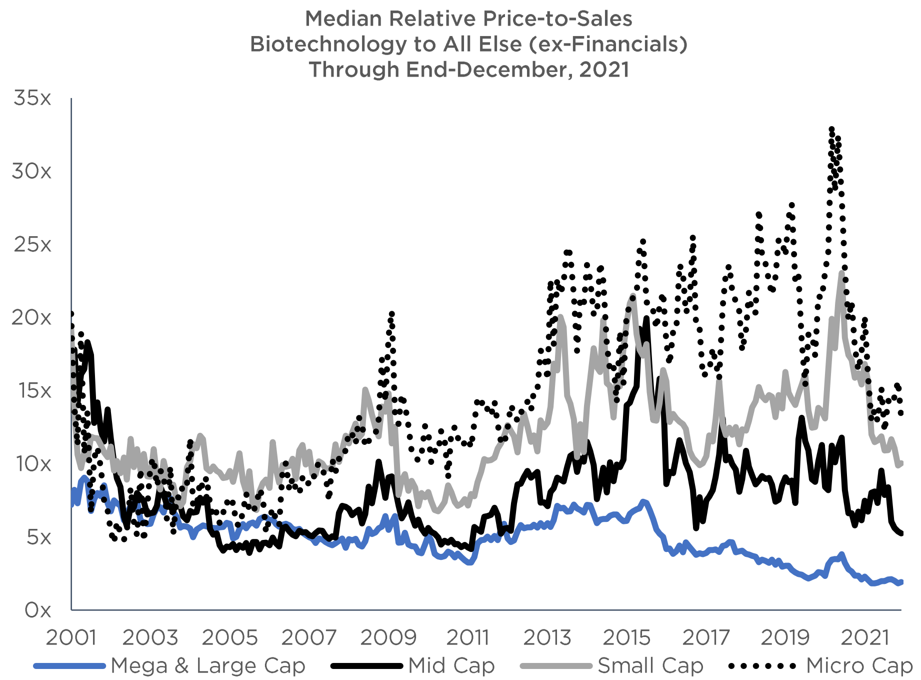
BIG HEALTHCARE COMPANIES ARE INCREASINGLY PROFITABLE

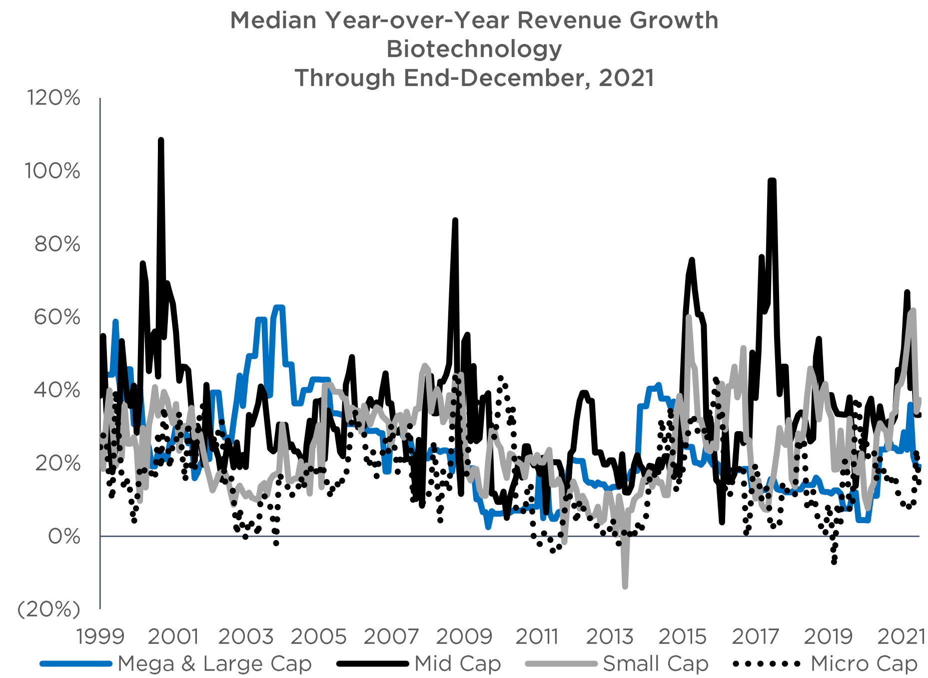
A potential explanation for this huge stock performance differential based on size might be profit margins. While mega / cap companies always were more profitable than small caps, that gap was consistent and flat for nearly 20 years. Now, there has been a widening, where the median small cap company is just about break-even today, and the median mega / large cap healthcare company has record net margins.



BIOTECHNOLOGY VALUATION VS. GROWTH OUTLOOK HAS CHANGED

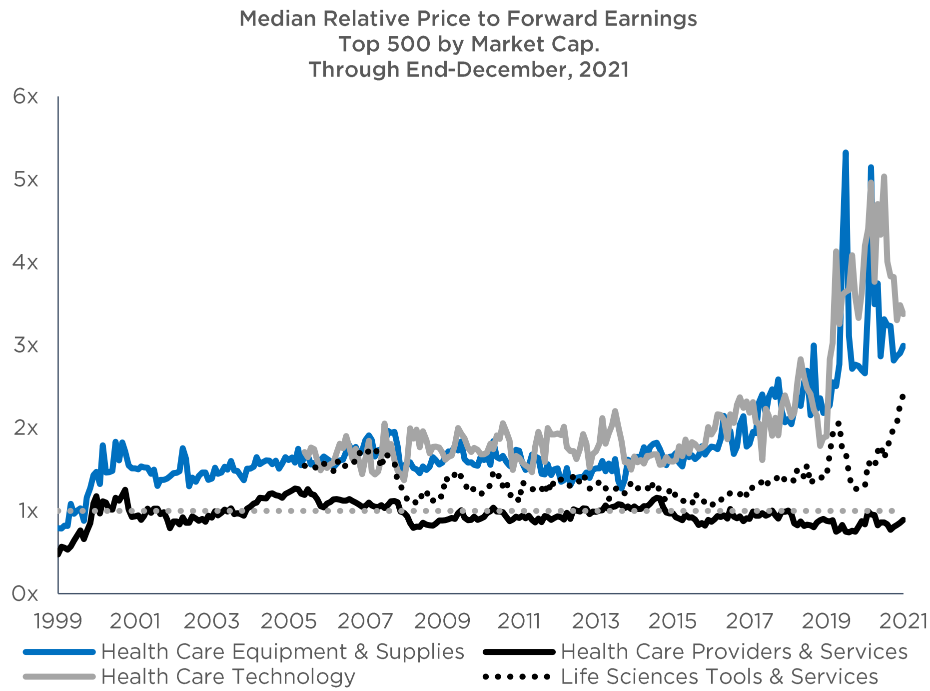
The biotechnology sell-off now appears too extreme (left chart). Mega / large cap biotechnology stocks have never been cheaper, and mid-cap biotechnology stocks are at ten-year relative lows. Meanwhile, the revenue growth rates for companies remain robust (right chart) implying that this valuation reset has been material. Our judgment is the risk-reward looks positive for biotechnology today.

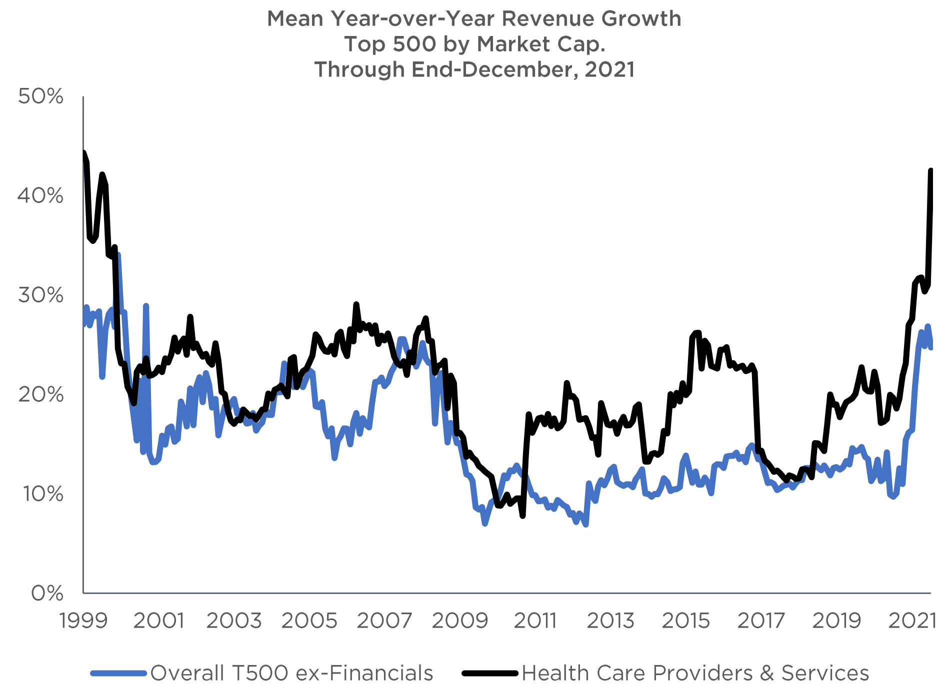




HEALTHCARE PROVIDERS AND SERVICES LOOK ATTRACTIVE

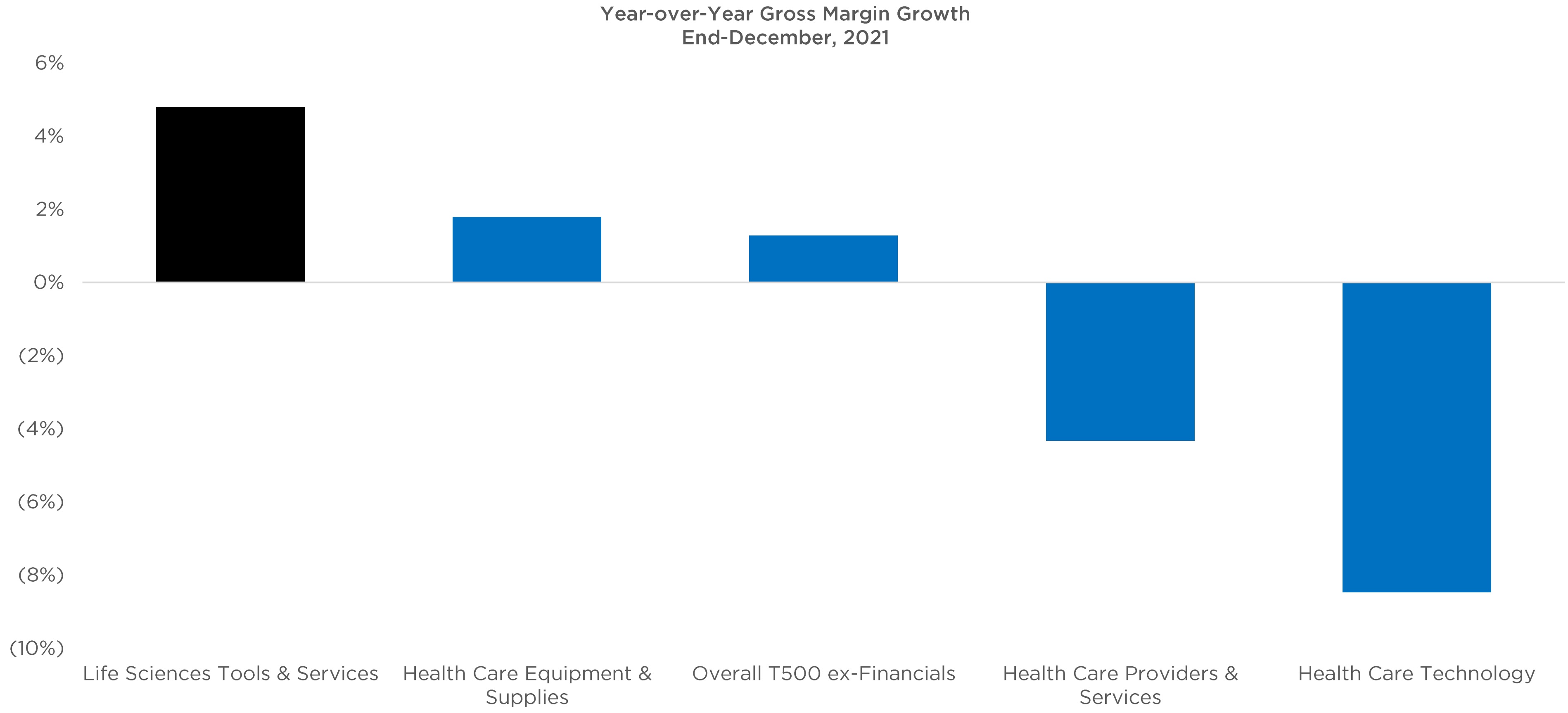
Healthcare providers and services companies remain the cheapest industry within healthcare, having seen relative multiple contraction over the last five years, while all the other healthcare industry groups experienced relative multiple expansion on price-to-forward earnings (left chart). Interestingly, this contraction happened despite higher 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.





LIFE SCIENCE TOOLS AND SERVICES HAVE EXPANDED GROSS MARGINS

Life sciences and tools stocks had the highest gross margin expansion in 2021, likely driving them to perform best among the healthcare industries. We continue to think the market will reward gross margin expansion as businesses that can offset rising input costs and beat margin expectations will likely outperform in 2022.

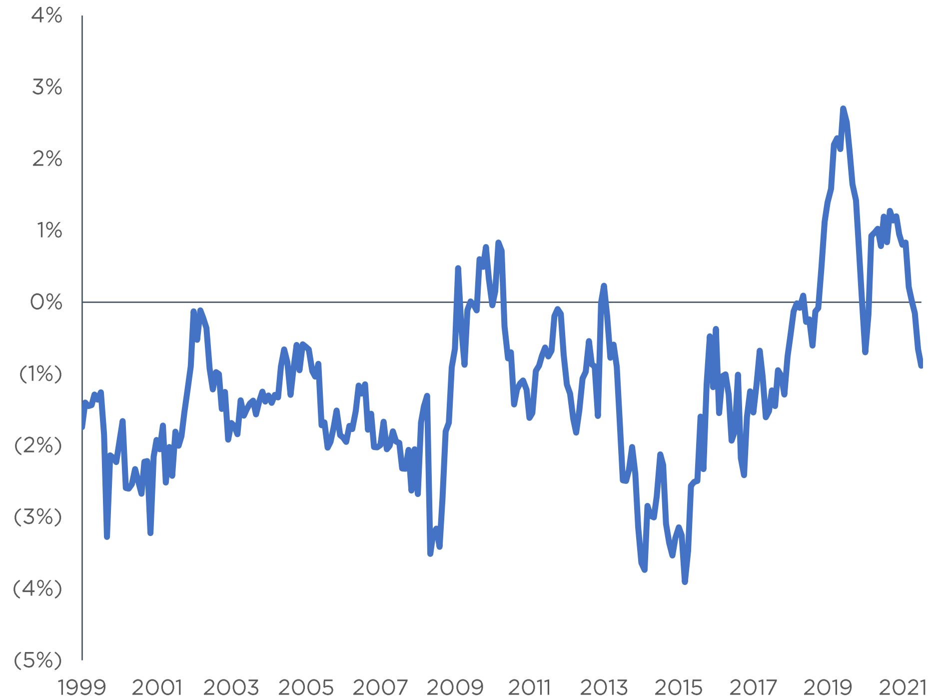


PHARMA SEEMS TOO CHEAP VS. CONSUMER STAPLES

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 59% 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-December, 2021

Median Relative Price to Forward Earnings
Mega & Large Cap. Pharma Biotech to Consumer Staples
Through End-December, 2021



THE US CONSUMER – GROSS UP AND NET UP

Our consumer activity gauge leads us to believe the US consumer remains in solid shape. However, investors have been concerned about a modest softening in retail sales and jobs data over the last two months.

1. **Investment Strategy #1:** Long quality reopening, short junk work from home. Since the beginning of the pandemic:
   - Quality reopening stocks have not outperformed junk reopening stocks
   - Junk work from home stocks have still outperformed quality reopening stocks

As the recovery continues, we see a high probability that quality outperforms junk, and reopening outperforms work from home. Hence, our recommendation is to:

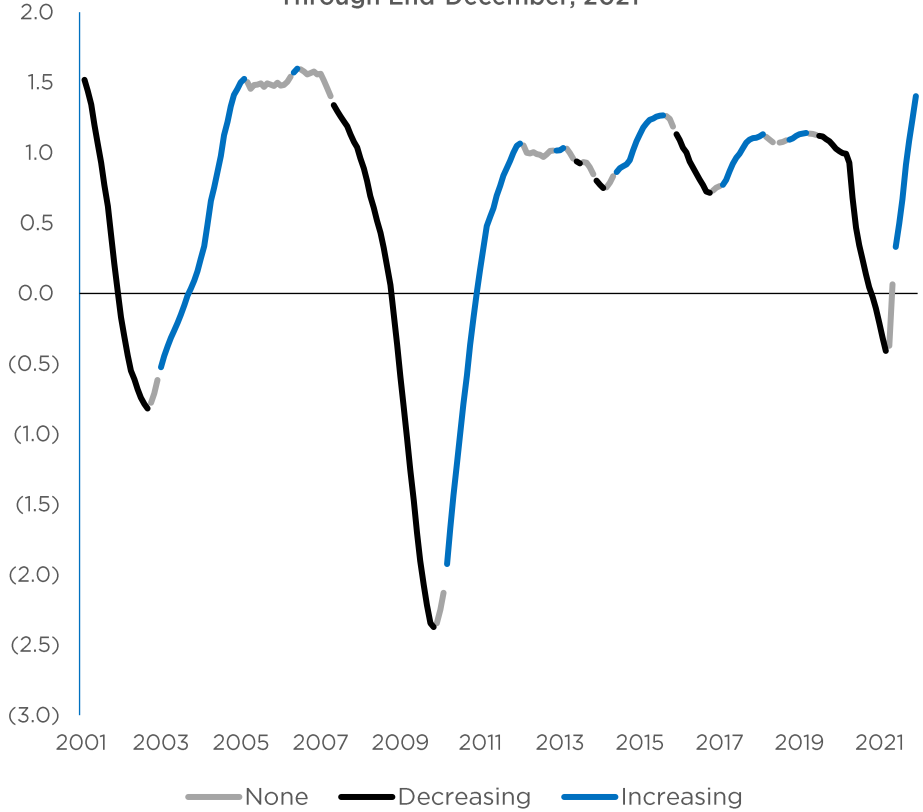
- **Long:** Quality stocks with high correlation to our "reopening" basket
- **Short:** "Junk" stocks with high correlation to our "work from home" basket

2. **Investment strategy #2:** We like a consumer barbell:
   - **Long:** Consumer services with suppressed profitability that likely recover as reopening continues and demand for services grow
   - **Long:** Select retailers given we want to run with higher-than-normal net exposure
   - **Short:** Highly idiosyncratic staples. We can see the logic of being long a staples ETF (to capture long-term above average performance) and short some high company-specific risk staples names given the fact pattern
   - **Short:** Durables that appear to trade like growth stocks with record momentum, and are likely over-earning (stocks ideas included)

OUR CONSUMER ACTIVITY GAUGE IS INCREASING

Our consumer activity gauge contains metrics like 90-day credit card delinquencies, retail sales, consumer confidence, wage growth, unemployment data, and several other metrics. While consumer activity was decreasing for much of 2020, it has rebounded sharply off the bottom. Obviously, the Delta and now Omicron variants are of concern to the pace of reopening and spend, but all indications are this will remain a robust holiday season.

Trivariate's Consumer Activity Signal Through End-December, 2021

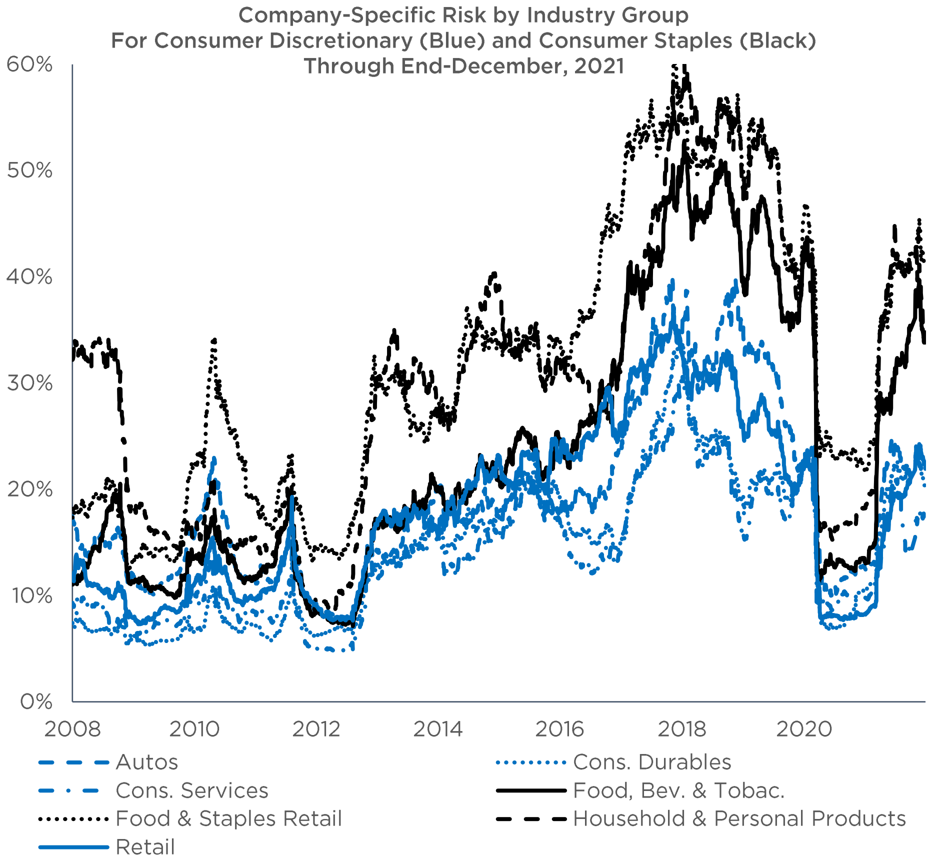


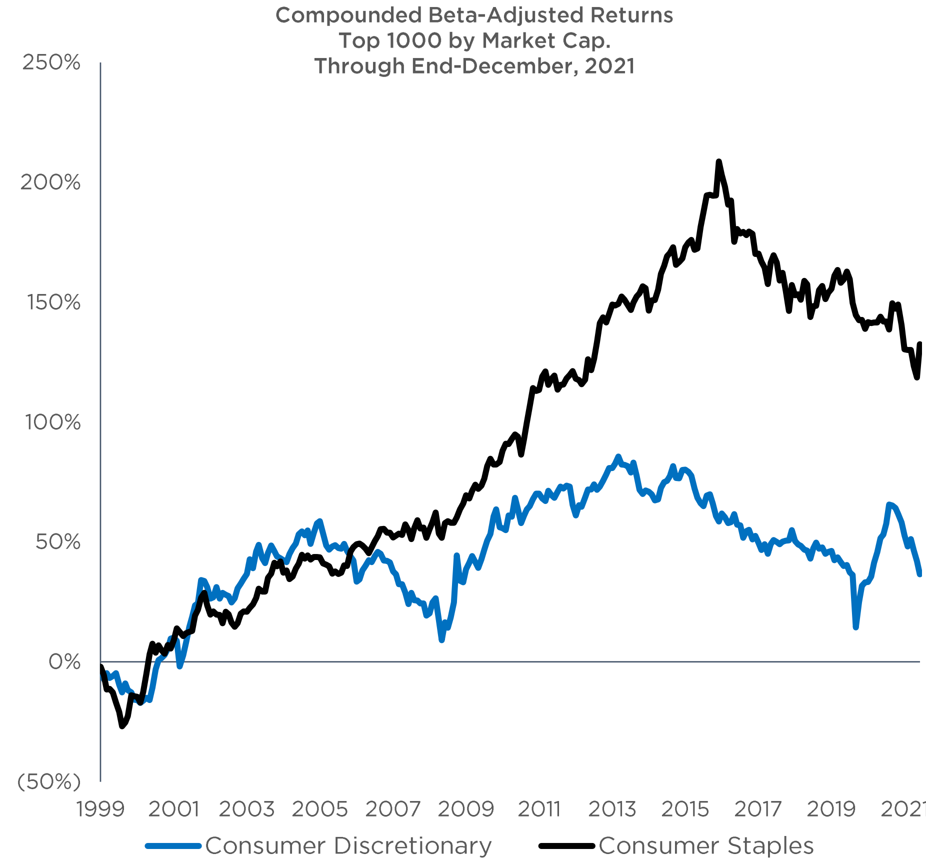
Consumer Activity Signals As of End-December, 2021

Consumer Activity Component	November 2021 Value	Percentile vs. Long-Term History
ADP Payrolls (YoY%)	4.5%	97.8%
US Hourly Earnings Growth (6-Month MA)	4.8%	95.7%
US Consumer Confidence (YoY%)	33.0%	92.8%
US Credit Cards 90+ Days Delinquency Rate	0.36	0.0%
Non-Farm Payrolls (YoY%)	4.1%	98.8%
US Personal Income (YoY% Change)	7.4%	87.9%
US Retail Sales	18.2%	99.1%
Atlanta Fed Wage Growth Tracker	4.3%	77.8%

STAPLES ARE MORE IDIOSYNCRATIC AND HAVE HAD HIGHER ALPHA…

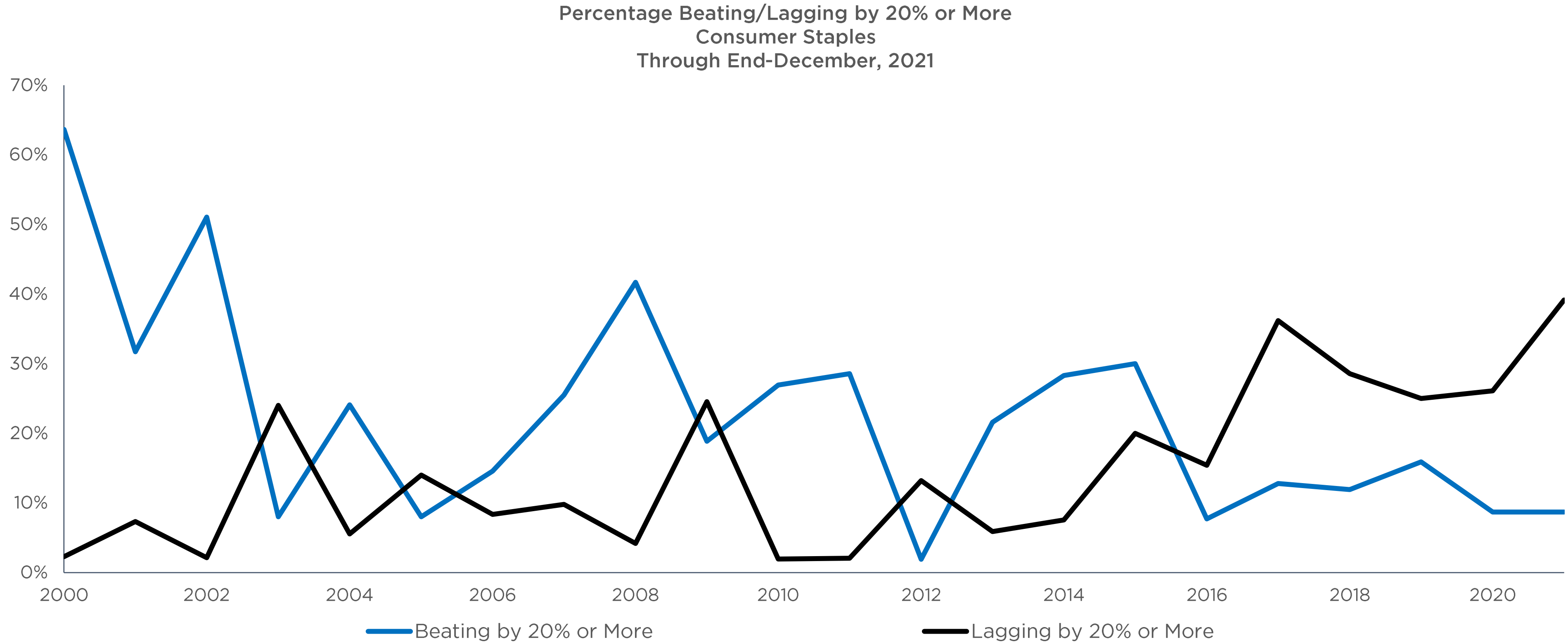
Conventional wisdom is that staples are more macro and discretionary stocks are more idiosyncratic among consumer analysts. However, (left chart) food, beverage & tobacco, and household and personal products tend to have more company-specific risk than retail, durables and consumer services. Since the TMT bubble, staples have also strongly beaten discretionary on a beta-adjusted basis (right chart)





…BUT THERE ARE MORE LARGE LAGGARDS IN STAPLES

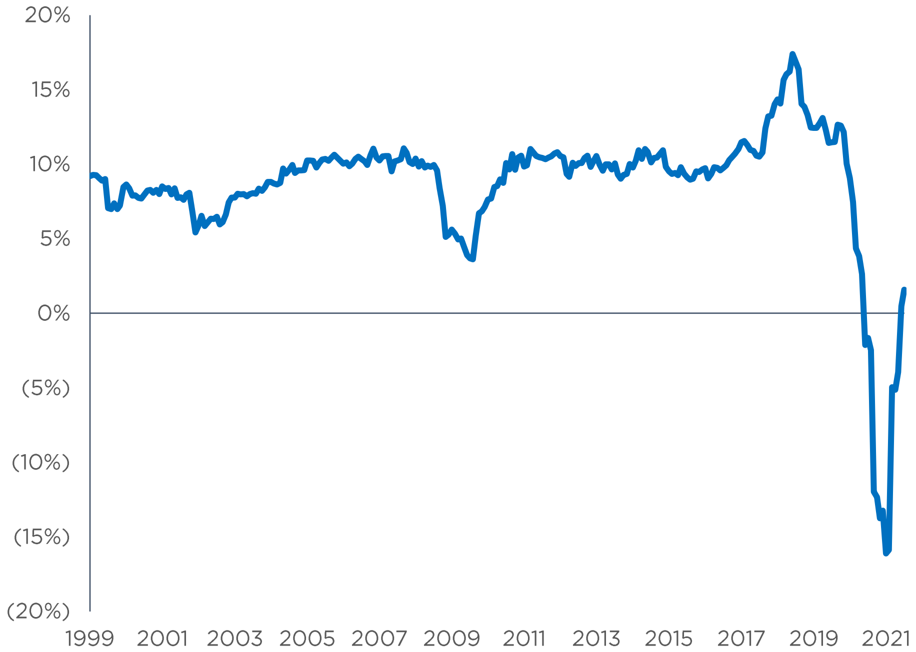
Identifying strong long ideas in staples is particularly challenging today. The fewest number of staples in nine years are beating the market by 20% or more but the largest number of staples stocks in 21 years are lagging the market by 20% or more. Given there is higher company-specific risk in staples than many might surmise, hunting for idiosyncratic shorts in staples is prudent. We could also see the logic to stay long a staples ETF and short some high company-specific risk staples to lower the net exposure.



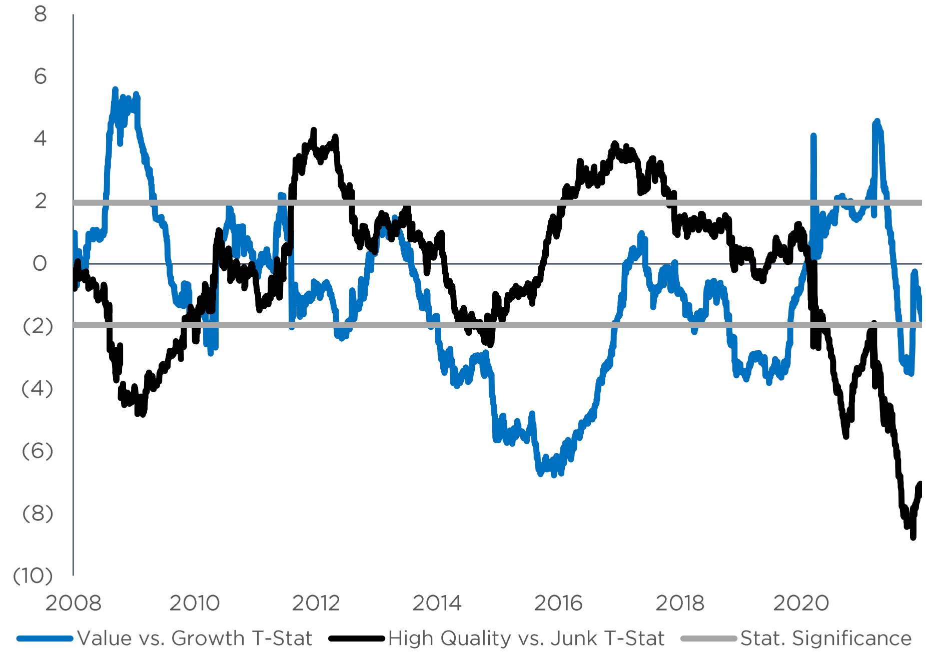
THE CONSUMER SERVICES INDUSTRY IS UNDER-EARNING THE MOST

The consumer service industry has been rocked by COVID-19, with the average companies' net margin bouncing just above record lows right now (left chart). As the economy and demand for services grow, it stands to reason that the services industry will regain profitability back toward the lower volatility high single-digit band it was in for the previous two decades. The result of the sustained losses in consumer services is the industry now has the strongest statistically significant relationship to junk and value this cycle (right chart).

Consumer Services Industry Average Stock Net Margin
Top 1000 Stocks
Through End-December, 2021



Rolling 10-Year T-Statistics
Consumer Services
Through End-December, 2021

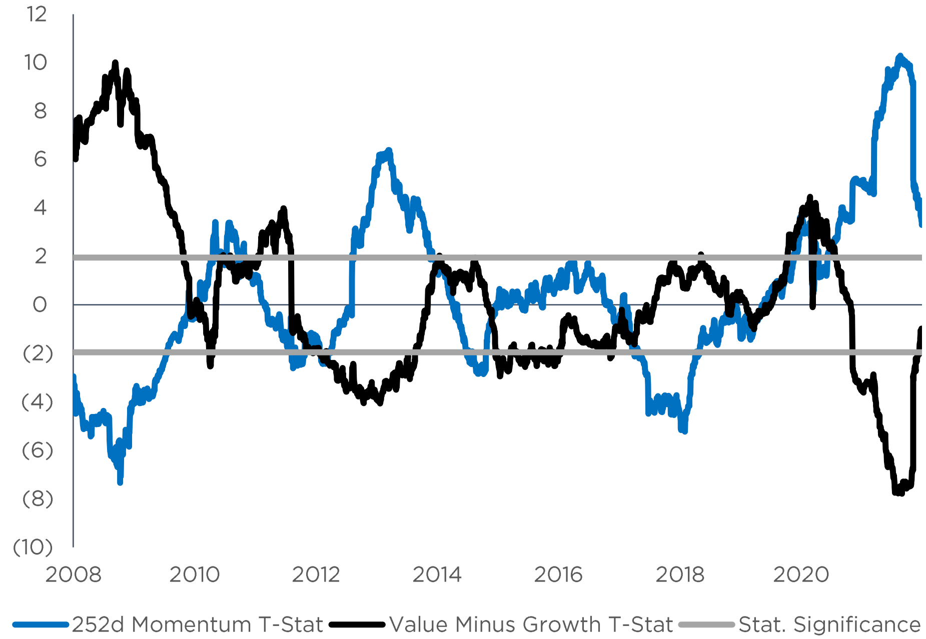


WHEREAS DURABLES MARGINS ARE AT ALL-TIME HIGHS

Durables appear to be over-earning the most, with record profitability due in large part to housing demand and the homebuilders (left chart), a trend that is likely to rollover in the coming quarters. The result of strong profitability is the industry now trades the most like the growth universe ever, with the highest momentum ever (right chart). While durables can have prolonged cycles, we doubt there will be a structural shift to growth and momentum for the industry, viewing this as a place to sell winners over the coming months and the relationship is now the exact opposite it was in the 2008 cycle recovery. Indeed, in the last month this shift has been unwound significantly.

Consumer Durables & Apparel Median Stock Net Margin
Top 1000 Stocks
Through End-December, 2021

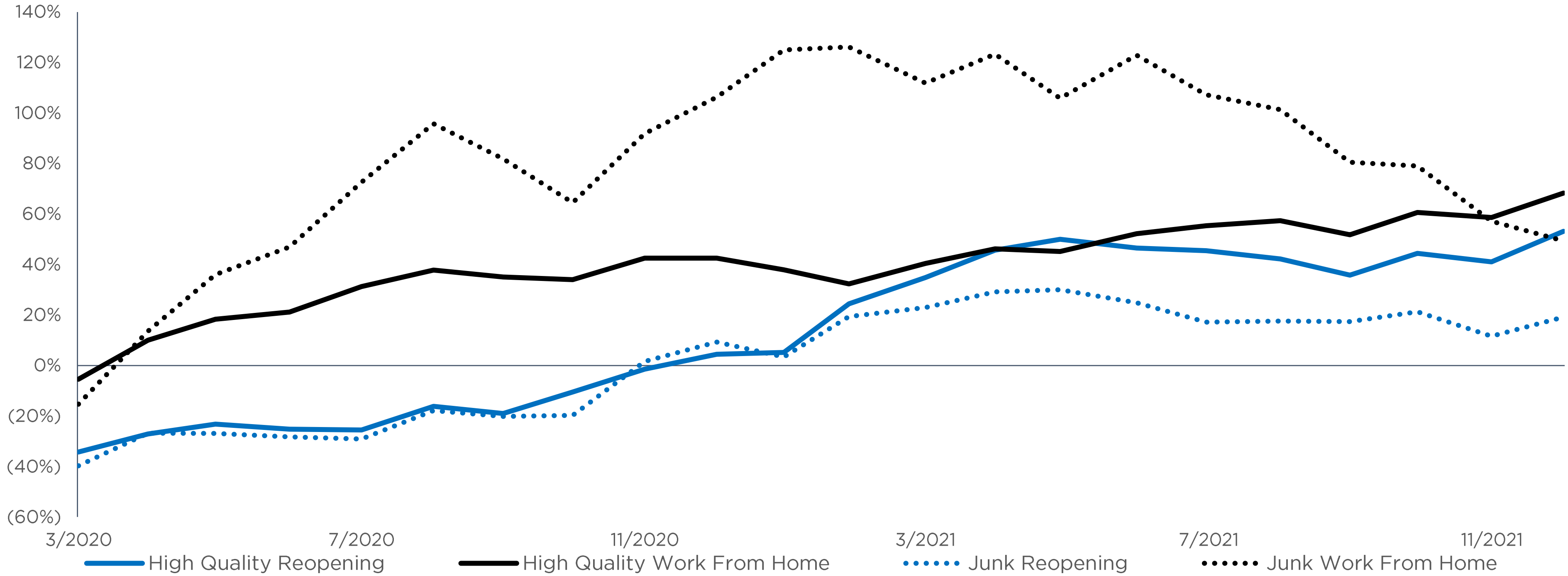
Rolling 10-Year T-Statistic
Consumer Durables & Apparel
Through End-December, 2021



HIGH QUALITY IS STARTING TO RELATIVELY WORK

We analyzed the returns of quality vs. junk within "work from home" and "reopening" consumer stocks, given the on-again-off-again nature of consumer demand and experience in a Delta-now-Omicron-variant world. We have two observations. Firstly, we think quality reopening will ultimately outperforming junk reopening by a more substantial margin over the coming quarters. Secondly, we think quality reopening will perform better than junk work from home as the world continues to adapt and adjust. Our advice is to look for quality reopening long ideas, and junk work from home short ideas.

Compounded Median Return, Top 1000 Consumer Stocks
Reopening vs. Work-from-Home Crossed with High Quality vs. Junk
Through End-December, 2021



STRATEGY 1: QUALITY CROSSED WITH WORK FROM HOME / REOPENING

Consistent with this theme, we offer long and short consumer ideas in the quality reopening and junk work from home buckets, respectively.

Long Quality Reopening, Short Junk Work From Home, As of End-December, 2021

Longs				Shorts			
Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)	Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
HLT	Hilton Worldwide Holdings Inc.	Consumer Services	43.48	AMZN	Amazon.com, Inc.	Retailing	1691.00
GPC	Genuine Parts Company	Retailing	19.97	MELI	MercadoLibre, Inc.	Retailing	68.04
LKQ	LKQ Corporation	Retailing	17.50	CPNG	Coupang, Inc.	Retailing	51.46
MHK	Mohawk Industries, Inc.	Consumer Durables & App.	12.34	GRAB	Grab Holdings Limited	Retailing	26.67
TPR	Tapestry, Inc.	Consumer Durables & App.	11.17	W	Wayfair Inc.	Retailing	19.86
H	Hyatt Hotels Corporation	Consumer Services	10.54	CVNA	Carvana Co.	Retailing	19.84
LEVI	Levi Strauss & Co.	Consumer Durables & App.	10.06	FTCH	Farfetch Limited	Retailing	12.41
CPRI	Capri Holdings Limited	Consumer Durables & App.	9.77	PTON	Peloton Interactive, Inc.	Consumer Durables & App.	11.81
RL	Ralph Lauren Corporation	Consumer Durables & App.	8.75	DKNG	DraftKings Inc.	Consumer Services	11.17
CHH	Choice Hotels International, Inc.	Consumer Services	8.64	SAM	The Boston Beer Company, Inc.	Food, Beverage & Tobacco	6.16
PVH	PVH Corp.	Consumer Durables & App.	7.46				

STRATEGY 2: A BARBELL

Another consumer theme we like is a barbell approach - long retail as discretionary tends to work when consumer activity is strong and services on a rebound of suppressed profitability - short idiosyncratic staples and durables which are potentially over-earning.

Long Retailers and Services that Favored by Our Model, Short Highly Idiosyncratic Staples and Durables Our Model Disfavors, As of End-December, 2021

Longs

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
HD	The Home Depot, Inc.	Retailing	433.37
LOW	Lowe's Companies, Inc.	Retailing	174.15
TGT	Target Corporation	Retailing	110.89
MAR	Marriott International, Inc.	Consumer Services	53.82
CMG	Chipotle Mexican Grill, Inc.	Consumer Services	49.19
ORLY	O'Reilly Automotive, Inc.	Retailing	47.59
AZO	AutoZone, Inc.	Retailing	43.26
YUM	Yum! Brands, Inc.	Consumer Services	40.70
ROST	Ross Stores, Inc.	Retailing	40.38
DLTR	Dollar Tree, Inc.	Retailing	31.61
TSCO	Tractor Supply Company	Retailing	27.16
BBY	Best Buy Co., Inc.	Retailing	24.44
ULTA	Ulta Beauty, Inc.	Retailing	22.32
MGM	MGM Resorts International	Consumer Services	21.05

Shorts

Ticker	Company Name	Industry Group	Market Cap ($ US. Bil)
KHC	The Kraft Heinz Company	Food, Beverage & Tobacco	43.94
GRMN	Garmin Ltd.	Consumer Durables & Apparel	26.19
CAG	Conagra Brands, Inc.	Food, Beverage & Tobacco	16.38
HAS	Hasbro, Inc.	Consumer Durables & Apparel	14.04
CPB	Campbell Soup Company	Food, Beverage & Tobacco	13.11
PTON	Peloton Interactive, Inc.	Consumer Durables & Apparel	11.81
CASY	Casey's General Stores, Inc.	Food & Staples Retailing	7.32
YETI	YETI Holdings, Inc.	Consumer Durables & Apparel	7.26
SAM	The Boston Beer Company, Inc.	Food, Beverage & Tobacco	6.16
FLO	Flowers Foods, Inc.	Food, Beverage & Tobacco	5.81
ELY	Callaway Golf Company	Consumer Durables & Apparel	5.10
LANC	Lancaster Colony Corporation	Food, Beverage & Tobacco	4.56
IBP	Installed Building Products, Inc.	Consumer Durables & Apparel	4.12
GOLF	Acushnet Holdings Corp.	Consumer Durables & Apparel	3.91
SONO	Sonos, Inc.	Consumer Durables & Apparel	3.79
SWIM	Latham Group, Inc.	Consumer Durables & Apparel	3.00
MED	Medifast, Inc.	Household & Personal Products	2.42
THS	TreeHouse Foods, Inc.	Food, Beverage & Tobacco	2.26

CONTROVERSIES AND VARIABLES TO MONITOR FOR BANKS

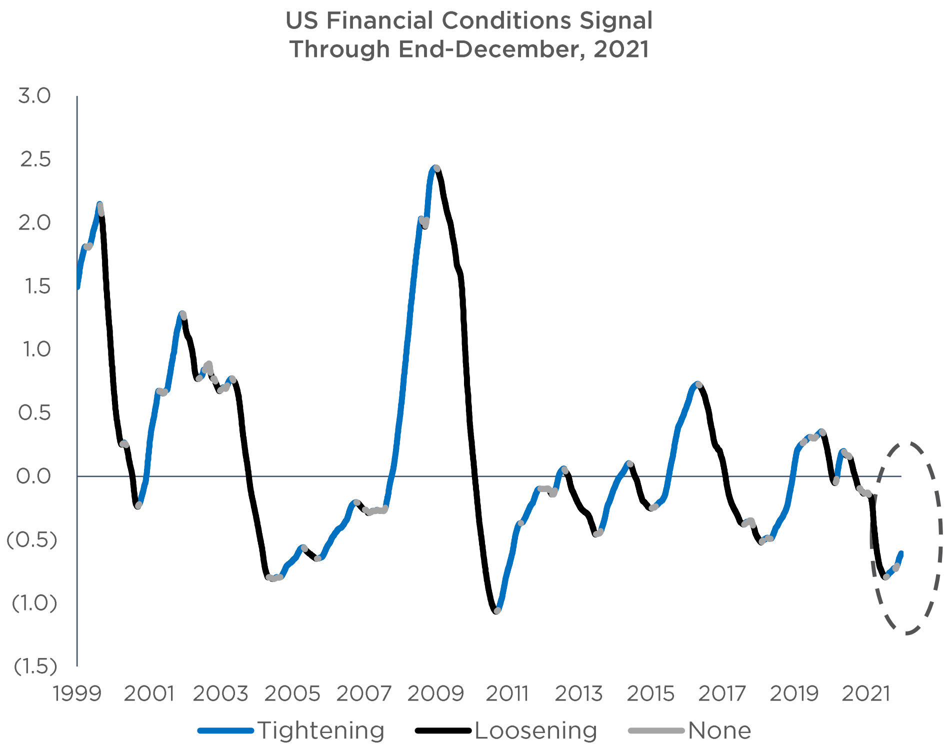
We took a detailed look at the banks sector and research key investment controversies facing bank stock investors and three data points to monitor. We think these concepts apply broadly to investors in other industries as well. The controversies are:

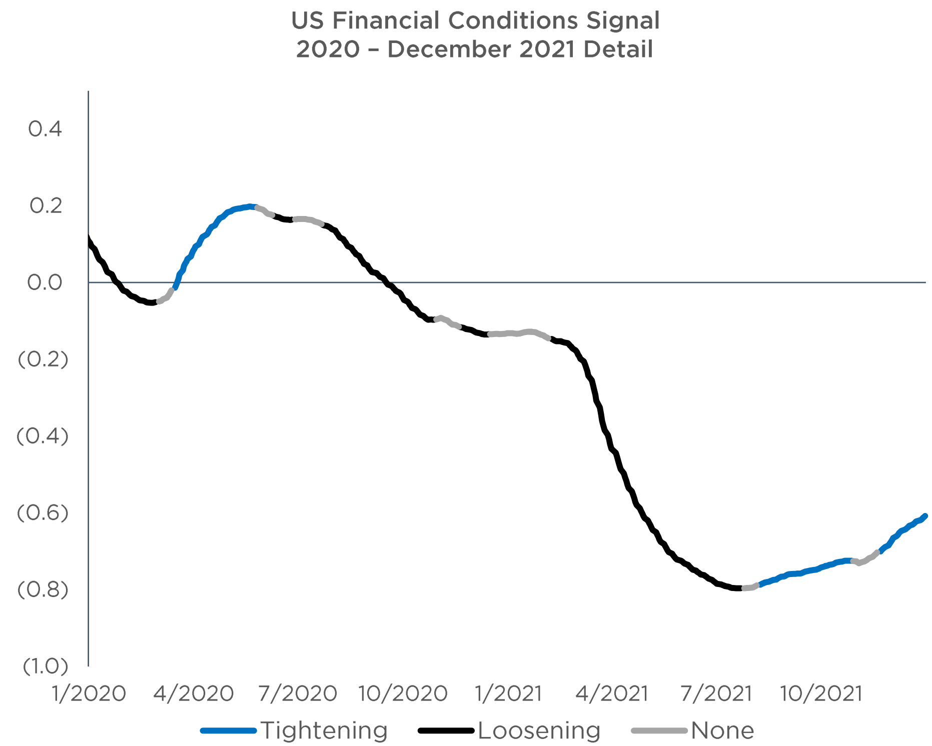
1. **Gross Exposure:** Our quantitative models work better at discriminating banks stocks when financial conditions are loosening, something we capitalized on earlier in the year by recommending high gross exposure in banks. However, financial conditions have tightened over the past couple of months and are neutral now. 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 excessively anticipatory of fundamentals – they think rates will rise and this well help the net interest margins of banks
3. **Large banks look more attractive than small**, with balance sheets that have improved more without a commensurate improvement in relative valuation. Micro cap. quality banks were cheaper than micro cap. junk banks, but that has now corrected.

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.

FINANCIAL CONDITIONS ARE TIGHTENING AGAIN

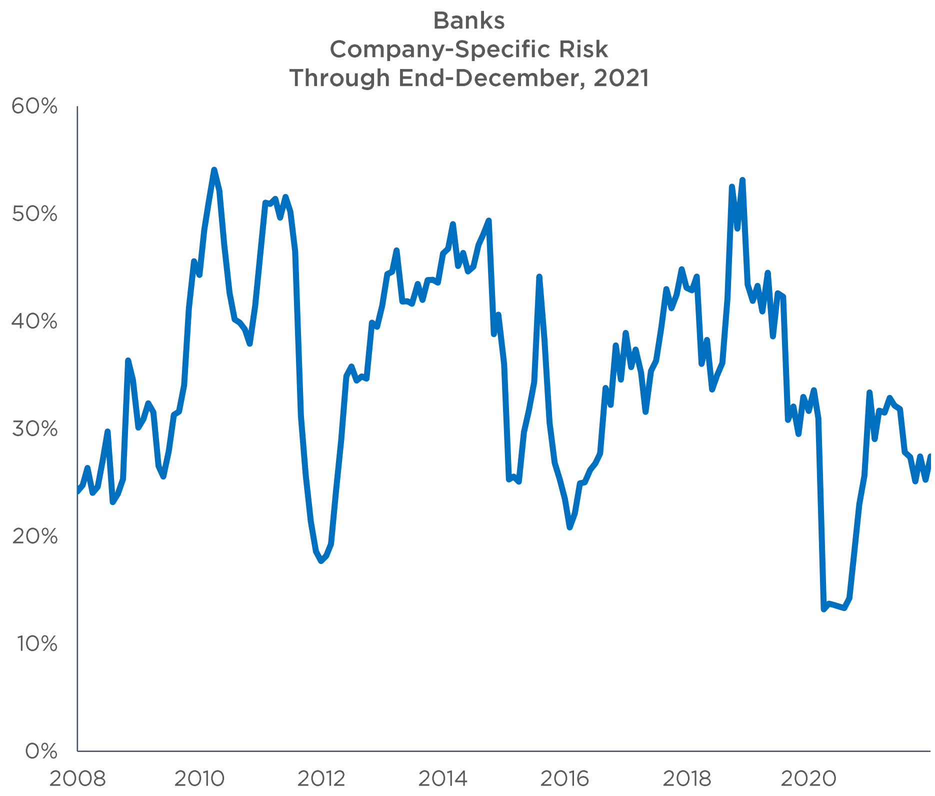
We evaluate financial conditions by combining credit spreads, mortgage rates, US Treasury volatility, the Bloomberg Financial Conditions Index, and other signals. We intentionally try to create a slower moving signal so that we are not over-reacting to shorter term moves in financial conditions. Our framework officially flagged loosening financial conditions in March of this year. This loosening stopped on July 26th according to our framework and tightening began on August 9th.   Today, conditions are tightening after a short neutral period

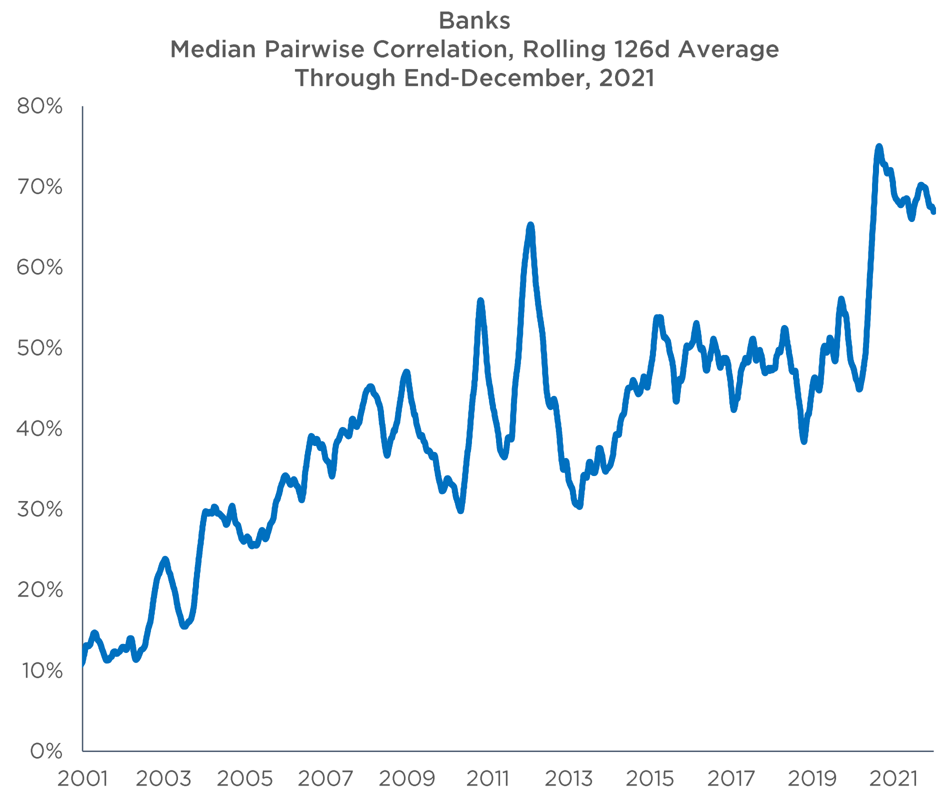




OTHER DATA SUGGEST STOCK SELECTION IN BANKS IS TOUGH TODAY

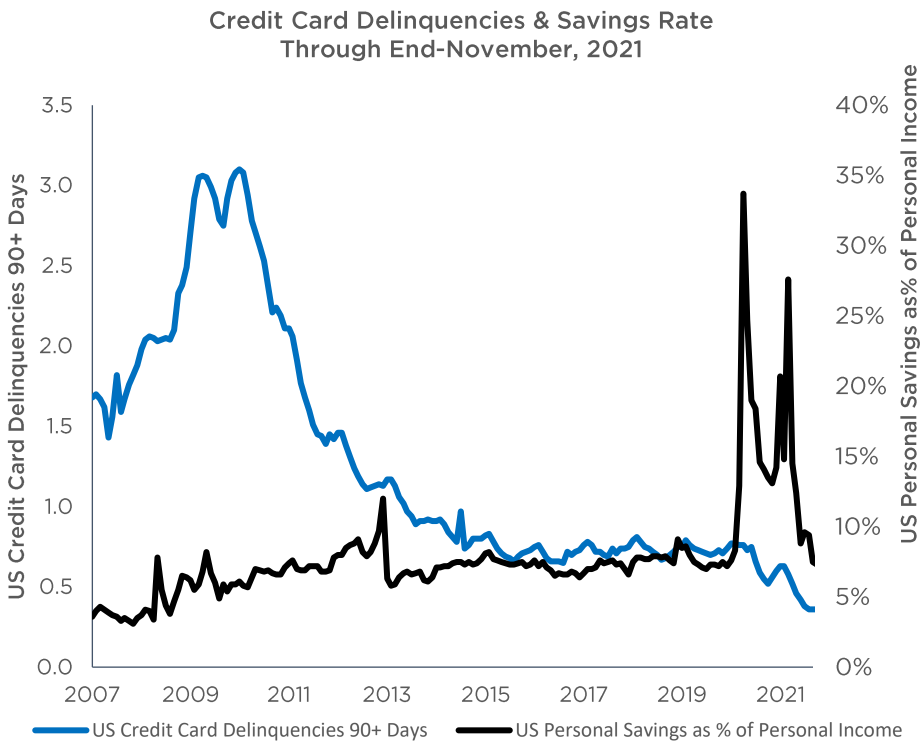
Company-specific risk for banks has remained relatively low, and below long-term averages for banks (left chart). The average pairwise return correlation of banks is currently 0.7 on a twenty-year trend of higher correlation that was only 0.2 following the TMT crisis (right chart)

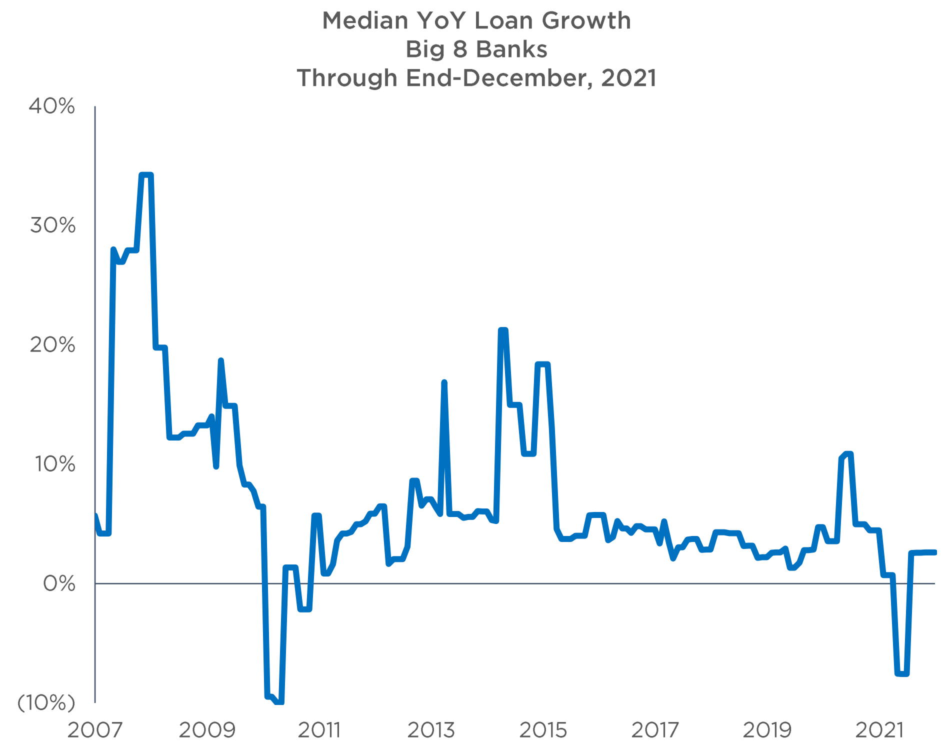




WATCH THE SAVINGS RATE AND LOAN GROWTH TO GAUGE REVISIONS

As generalists, our observation is that bank-stock investors excessively focusing on net interest margins, trying to gauge a few bps up or down. The bigger issue in our judgment is loan growth, and what could drive that as the cycle expands. The consumer is in great shape, with 90-day credit card delinquencies at a cycle low and the savings rate quite elevated (left chart). Loan growth has started to pickup for the biggest banks (right chart) but likely requires more dis-savings and a more demanding consumer before growing to levels seen in 2014-2015

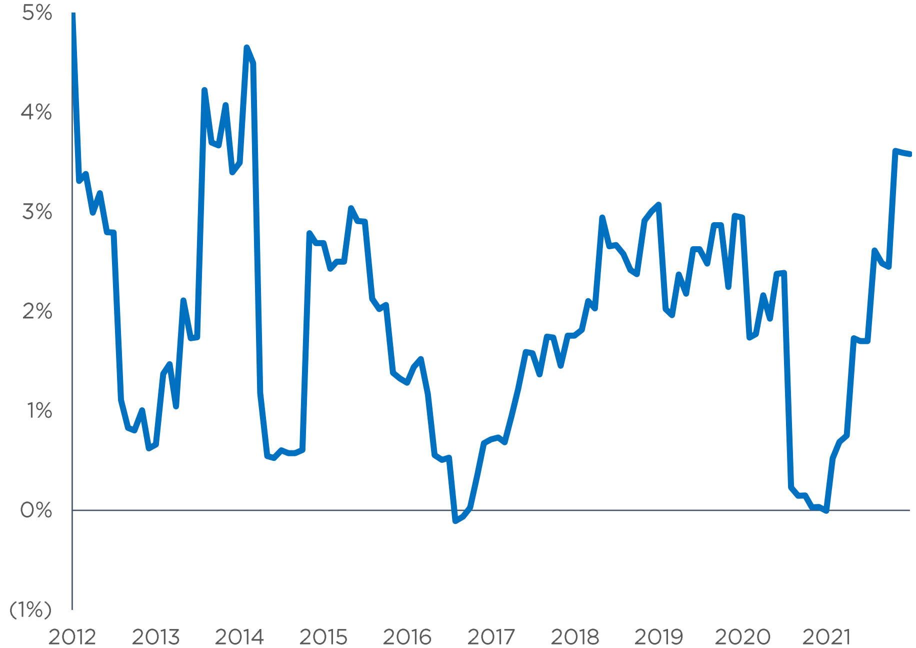




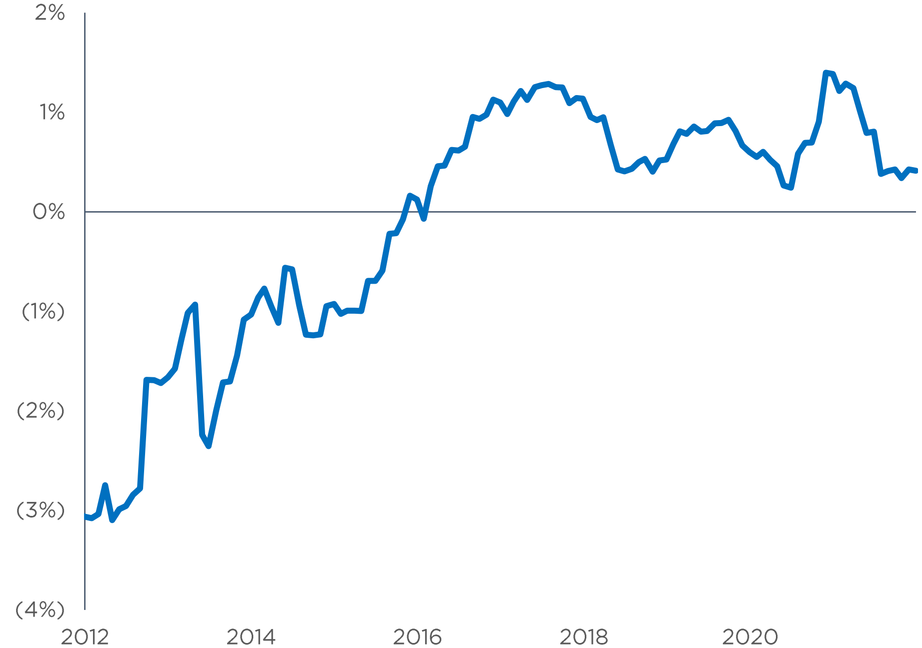
THE BIG 8: INCOME STATEMENT AND BALANCE SHEET IMPROVEMENT

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. Return on tangible equity (left chart) now shows the large banks are at cycle highs on return on tangible book relative to the rest of banks (median ROTE of the Big 8 is now 18.4% vs 14.8% for the larger universe). This is the highest level of excess ROTE since 2014. 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).

Relative Return on Tangible Equity
Big 8 Banks Minus Top 3000 Median
Through End-December, 2021

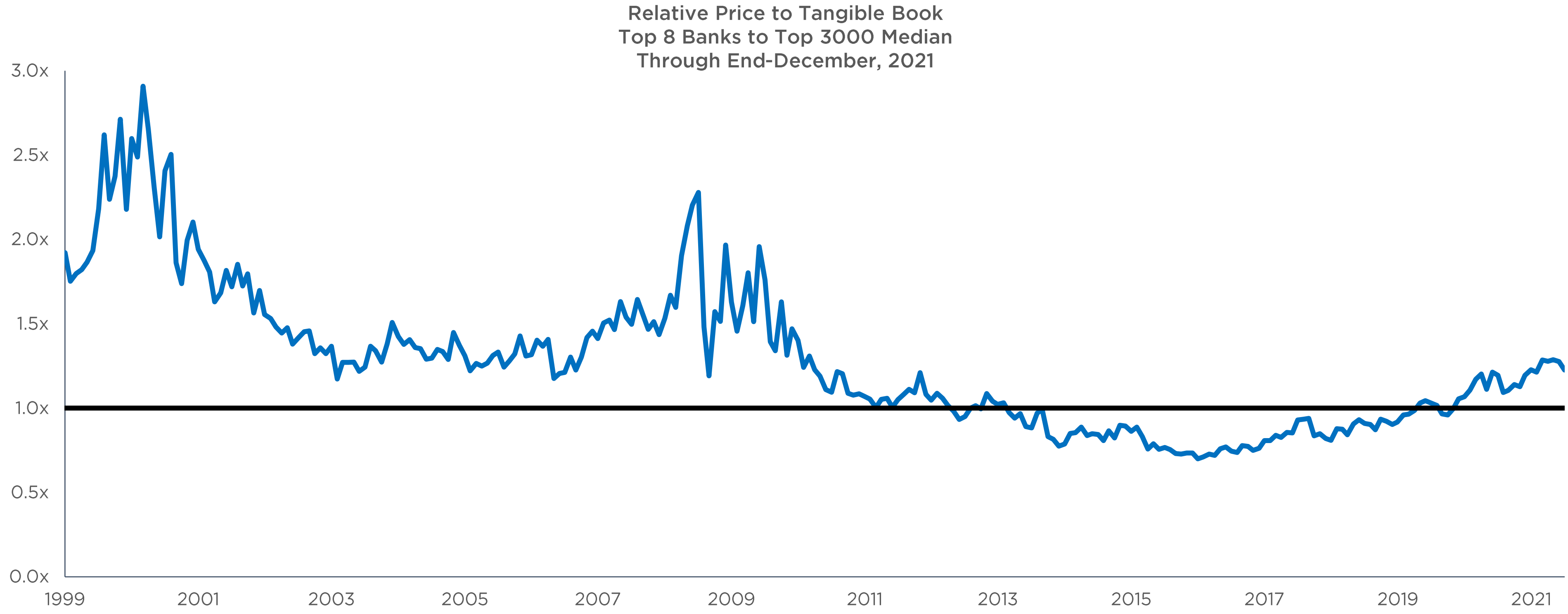


Relative Tier One Ratio
Big 8 Banks Minus Top 3000 Average
Through End-December, 2021



DESPITE THIS RELATIVE STRENGTH – VALUATION PREMIA ARE MODEST

Despite the relatively higher profitability and improved balance sheets, the large cap. banks barely trade at a premium to the broader group of banks. If longer-term history is a guide, the large cap. banks relative valuation could still substantially expand, even as the broader universe in-part have premia related to M&A potential. Our judgment is to prefer the Big 8 banks to the broader universe of banks, as their improved income statements and balance sheets should cost more relative to regionals



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 show on the right.

Big 8 Banks
Price to Tangible Book Percentile vs. History
Through End-December, 2021

Ticker	Company Name	Market Cap ($ US. Bil)	Price to Tangible Book	Percentile vs. History
MS	Morgan Stanley	176.14	2.42x	75.9%
JPM	JPMorgan Chase & Co.	467.97	2.29x	71.1%
BAC	Bank of America Corporation	364.11	2.02x	58.1%
PNC	The PNC Financial Services Group, Inc.	84.75	2.10x	51.9%
GS	The Goldman Sachs Group, Inc.	127.61	1.39x	50.0%
C	Citigroup Inc.	119.83	0.76x	15.2%
WFC	Wells Fargo & Company	191.31	1.34x	7.8%
USB	U.S. Bancorp	83.29	2.24x	7.0%

Banks Stocks with Relatively Weak Tangible Book Growth
That Have Also Seen Material Price-to-Tangible Book Multiple Expansion
August 4th, 2020 Through End-November, 2021

Ticker	Company Name	Market Cap ($ US. Bil)	Book Value Growth	Price to Tangible Book Growth
PNC	The PNC Financial Services Group, Inc.	89.27	3.9%	92%
FITB	Fifth Third Bancorp	30.03	(2.5%)	122%
RF	Regions Financial Corporation	22.60	9.9%	100%
WAL	Western Alliance Bancorporation	11.99	28.7%	164%
CMA	Comerica Incorporated	11.15	(0.1%)	112%
FCNCA	First Citizens BancShares, Inc.	7.91	(3.6%)	99%
PNFP	Pinnacle Financial Partners, Inc.	7.31	19.5%	104%
SNV	Synovus Financial Corp.	6.78	6.5%	118%
BPOP	Popular, Inc.	6.57	0.8%	113%
PACW	PacWest Bancorp	5.57	15.2%	127%
STL	Sterling Bancorp	4.95	13.1%	101%
CIT	CIT Group Inc.	4.91	14.9%	133%
HWC	Hancock Whitney Corporation	4.30	14.2%	134%
LOB	Live Oak Bancshares, Inc.	3.87	25.7%	364%
CBU	Community Bank System, Inc.	3.86	(2.2%)	37%
TBK	Triumph Bancorp, Inc.	2.91	16.4%	298%
FBP	First BanCorp.	2.80	(4.0%)	146%
VBTX	Veritex Holdings, Inc.	2.02	18.2%	100%
GWB	Great Western Bancorp, Inc.	1.88	3.5%	155%
TBBK	The Bancorp, Inc.	1.75	16.2%	185%
NTB	The Bank of N.T. Butterfield & Son Limited	1.75	(1.6%)	41%
FBNC	First Bancorp	1.38	11.1%	110%
CNOB	ConnectOne Bancorp, Inc.	1.33	18.9%	103%

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.

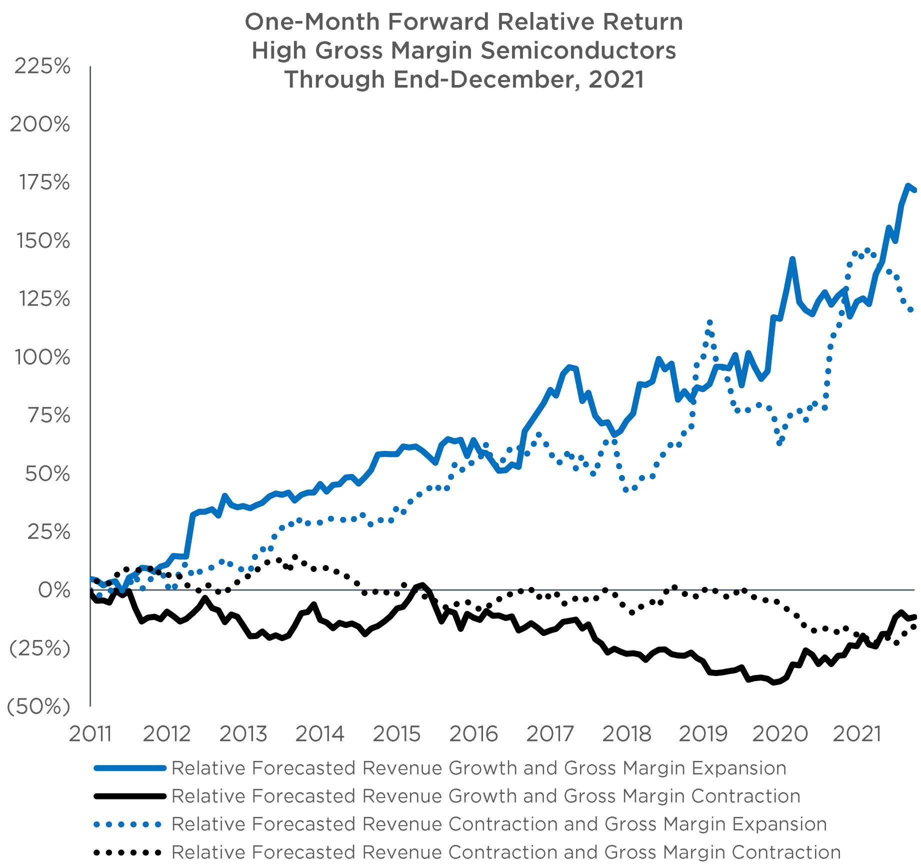
There is clearly some tension in the market on these key areas of technology, with high options activity and recent volatility reflecting supply chain concerns, etc. Going "back to the basics" of revenue growth vs. peers and margin expansion seems timely today. As such, we split each sector into high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

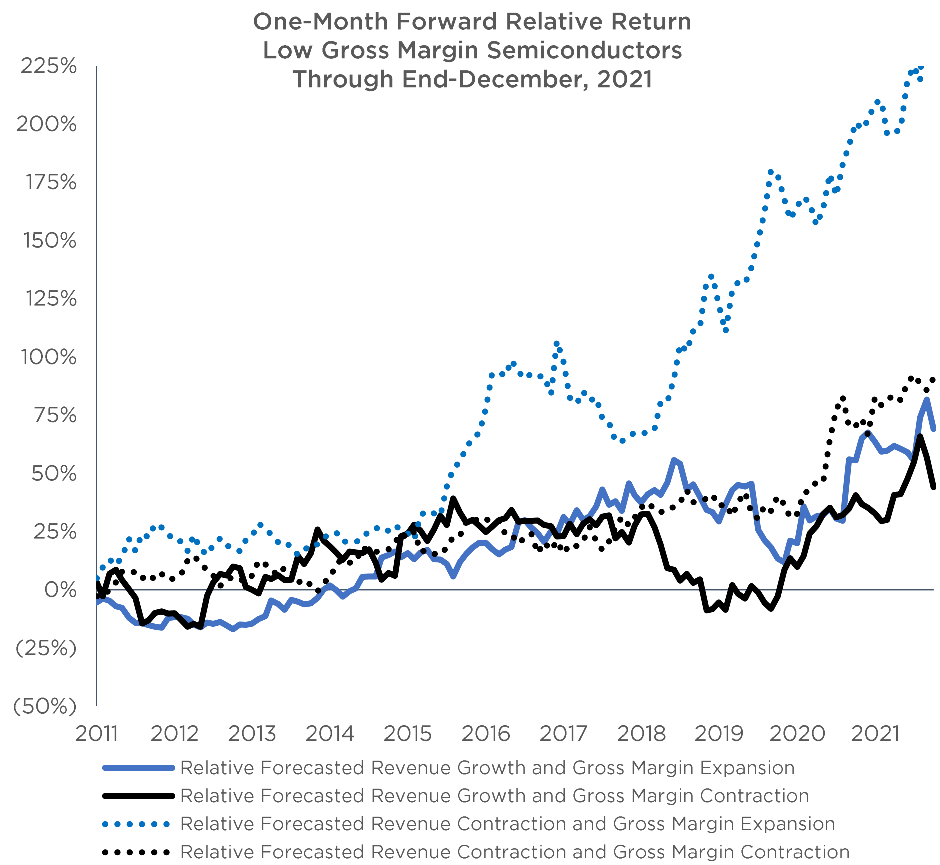
Semiconductors: Gross margin expansion is more important than share gain for both high and low gross margin chip makers. Multiple expansion / contraction and price momentum help us further refine the stock ideas.

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.

MARGIN EXPANSION MORE IMPORTANT THAN SHARE GAIN FOR CHIPS

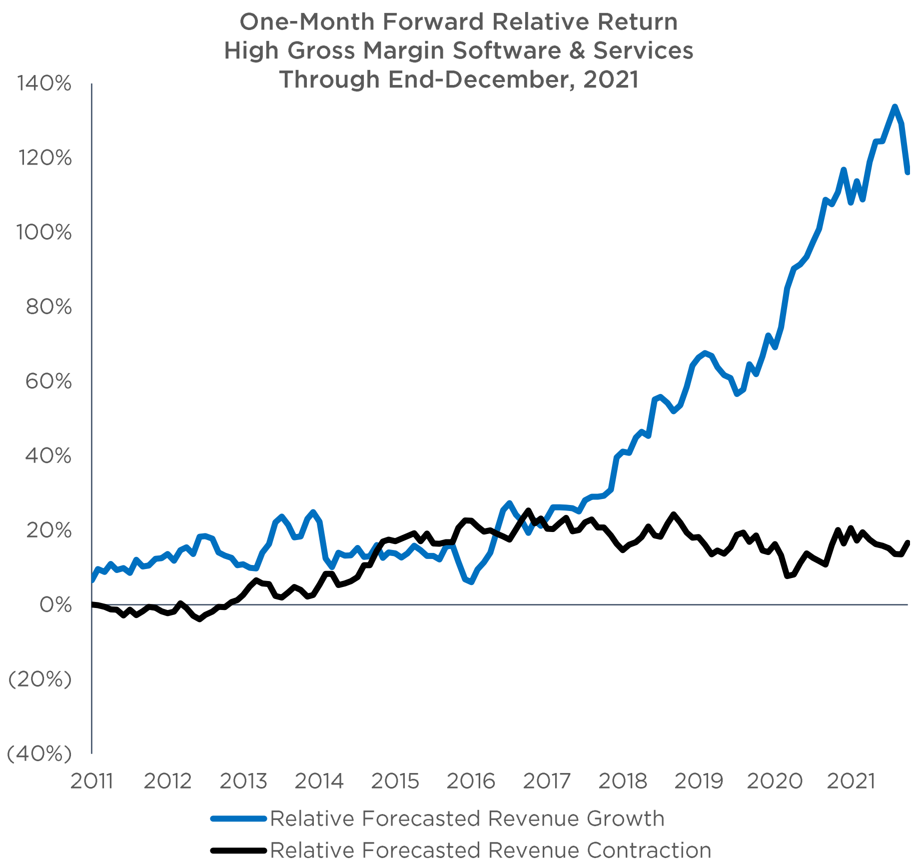
Combining share gain / loss and margin expansion / contraction, we notice that among high margin semis (left chart) margin contraction is punished, independent of the forecasted revenue outlook, and margin expansion is rewarded. For low margin chip makers (right chart), forecasted share loss and gross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

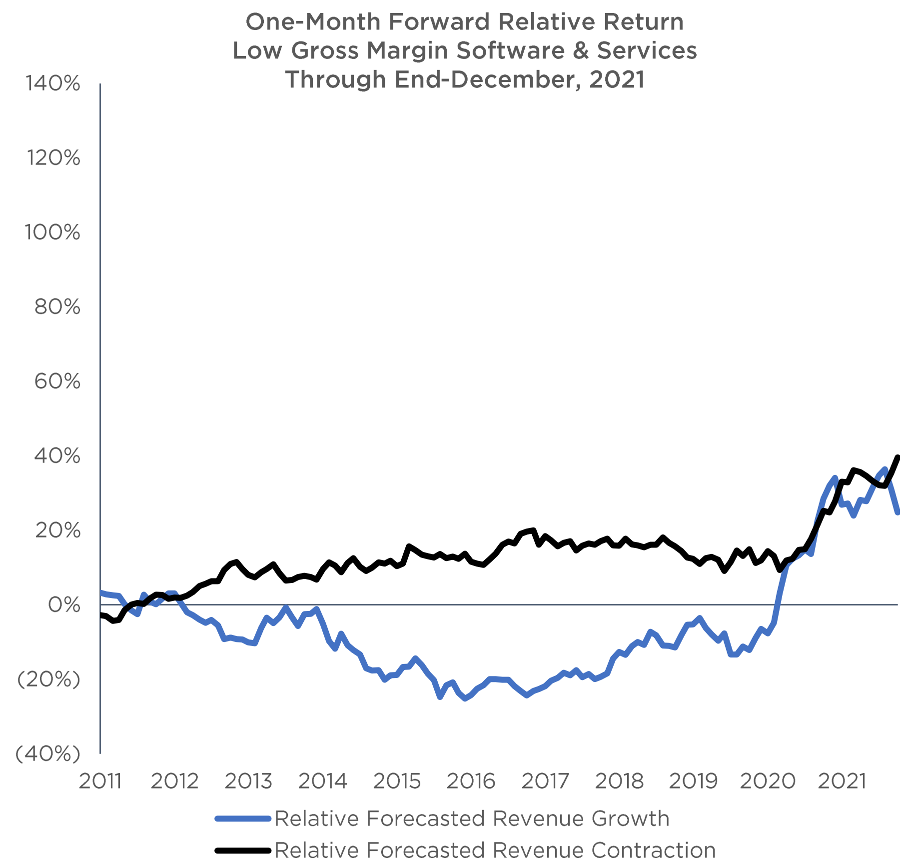




SHARE GAIN IS IMPORTANT FOR HIGH MARGIN SOFTWARE

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. Low gross margin software companies are generally weak stocks, whether forecasted revenue is high or low (right chart)





SEMIS AND SOFTWARE: THE REVENUE AND MARGIN PLAYBOOK

Semiconductors Playbook

High Current Goss Margins

Relative Forecast Gross Margin	Relative Forecast Revenue	Relative 3-Month Price-to-Forecast-Sales	Relative 3-Month Price Momentum
Expansion	Share Gain	Expansion	Positive
Expansion	Share Gain	Expansion	Negative
Expansion	Share Gain	Contraction	Positive
Expansion	Share Gain	Contraction	Negative
Expansion	Share Loss	Expansion	Positive
Expansion	Share Loss	Expansion	Negative
Expansion	Share Loss	Contraction	Positive
Expansion	Share Loss	Contraction	Negative
Contraction	Share Gain	Expansion	Positive
Contraction	Share Gain	Expansion	Negative
Contraction	Share Gain	Contraction	Positive
Contraction	Share Gain	Contraction	Negative
Contraction	Share Loss	Expansion	Positive
Contraction	Share Loss	Expansion	Negative
Contraction	Share Loss	Contraction	Positive
Contraction	Share Loss	Contraction	Negative

Low Current Goss Margins

Relative Forecast Gross Margin	Relative Forecast Revenue	Relative 3-Month Price-to-Forecast-Sales	Relative 3-Month Price Momentum
Expansion	Share Gain	Expansion	Positive
Expansion	Share Gain	Expansion	Negative
Expansion	Share Gain	Contraction	Positive
Expansion	Share Gain	Contraction	Negative
Expansion	Share Loss	Expansion	Positive
Expansion	Share Loss	Expansion	Negative
Expansion	Share Loss	Contraction	Positive
Expansion	Share Loss	Contraction	Negative
Contraction	Share Gain	Expansion	Positive
Contraction	Share Gain	Expansion	Negative
Contraction	Share Gain	Contraction	Positive
Contraction	Share Gain	Contraction	Negative
Contraction	Share Loss	Expansion	Positive
Contraction	Share Loss	Expansion	Negative
Contraction	Share Loss	Contraction	Positive
Contraction	Share Loss	Contraction	Negative

Software Playbook

High Current Goss Margins

Relative Forecast Gross Margin	Relative Forecast Revenue	Relative 3-Month Price-to-Forecast-Sales	Relative 3-Month Price Momentum
Expansion	Share Gain	Expansion	Positive
Expansion	Share Gain	Expansion	Negative
Expansion	Share Gain	Contraction	Positive
Expansion	Share Gain	Contraction	Negative
Expansion	Share Loss	Expansion	Positive
Expansion	Share Loss	Expansion	Negative
Expansion	Share Loss	Contraction	Positive
Expansion	Share Loss	Contraction	Negative
Contraction	Share Gain	Expansion	Positive
Contraction	Share Gain	Expansion	Negative
Contraction	Share Gain	Contraction	Positive
Contraction	Share Gain	Contraction	Negative
Contraction	Share Loss	Expansion	Positive
Contraction	Share Loss	Expansion	Negative
Contraction	Share Loss	Contraction	Positive
Contraction	Share Loss	Contraction	Negative

Low Current Goss Margins

Relative Forecast Gross Margin	Relative Forecast Revenue	Relative 3-Month Price-to-Forecast-Sales	Relative 3-Month Price Momentum
Expansion	Share Gain	Expansion	Positive
Expansion	Share Gain	Expansion	Negative
Expansion	Share Gain	Contraction	Positive
Expansion	Share Gain	Contraction	Negative
Expansion	Share Loss	Expansion	Positive
Expansion	Share Loss	Expansion	Negative
Expansion	Share Loss	Contraction	Positive
Expansion	Share Loss	Contraction	Negative
Contraction	Share Gain	Expansion	Positive
Contraction	Share Gain	Expansion	Negative
Contraction	Share Gain	Contraction	Positive
Contraction	Share Gain	Contraction	Negative
Contraction	Share Loss	Expansion	Positive
Contraction	Share Loss	Expansion	Negative
Contraction	Share Loss	Contraction	Positive
Contraction	Share Loss	Contraction	Negative

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 (stocks buy, top of left table). High margin semi short ideas with poor momentum continue to be weak (bottom left table). For low gross margin semis, buying stocks with good recent price momentum and forecasted margin expansion is best (top of right table). Low margin semis with poor momentum continue to lag (bottom right)

High Gross Margin Semiconductors

Buy Relative Gross Margin Growers, Multiple Contraction, and Low Momentum
Sell Relative Gross Margin Shrinkers, and Low Momentum
End-December, 2021

Ticker	Company Name	Market Cap ($ US. Bil)
Long		
NXPI	NXP Semiconductors N.V.	60.57
SWKS	Skyworks Solutions, Inc.	25.66
QRVO	Qorvo, Inc.	17.24
LSCC	Lattice Semiconductor Corporation	10.55
ALGM	Allegro MicroSystems, Inc.	6.86
Short		
INTC	Intel Corporation	209.45
TXN	Texas Instruments Incorporated	174.06
MCHP	Microchip Technology Incorporated	48.31
MPWR	Monolithic Power Systems, Inc.	22.74
OLED	Universal Display Corporation	7.78
SMTC	Semtech Corporation	5.73
POWI	Power Integrations, Inc.	5.60
CRUS	Cirrus Logic, Inc.	5.26
CAMT	Camtek Ltd.	2.02

Low Gross Margin Semiconductors
Buy Relative Gross Margin Growers with Lower Revenue Growth Expectations, Multiple Expansion, and High Momentum
Sell Relative Gross Margin Shrinkers with Higher Revenue Growth Expectations, and Low Momentum
End-December, 2021

Ticker	Company Name	Market Cap ($ US. Bil)
Long		
MU	Micron Technology, Inc.	104.34
ON	ON Semiconductor Corporation	29.26
AZTA	Azenta, Inc.	7.61
TSEM	Tower Semiconductor Ltd.	4.29
FORM	FormFactor, Inc.	3.58
AOSL	Alpha and Omega Semiconductor Limited	1.60
PLAB	Photronics, Inc.	1.15
Short		
ENPH	Enphase Energy, Inc.	24.68
SEDG	SolarEdge Technologies, Inc.	14.74
ACMR	ACM Research, Inc.	1.66
AXTI	AXT, Inc.	0.37

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-December, 2021

Long

Ticker	Company Name	Market Cap ($ US. Bil)
ADSK	Autodesk, Inc.	61.85
MDB	MongoDB, Inc.	35.34
OKTA	Okta, Inc.	34.87
HUBS	HubSpot, Inc.	31.14
RAMP	LiveRamp Holdings, Inc.	3.27
VERI	Veritone, Inc.	0.78

Short

Ticker	Company Name	Market Cap ($ US. Bil)
ADBE	Adobe Inc.	269.81
ORCL	Oracle Corporation	232.89
INTU	Intuit Inc.	182.14
TEAM	Atlassian Corporation Plc	96.37
SNPS	Synopsys, Inc.	56.54
PANW	Palo Alto Networks, Inc.	54.93
CDNS	Cadence Design Systems, Inc.	51.65
PAYX	Paychex, Inc.	49.25
ANSS	ANSYS, Inc.	35.00
CHKP	Check Point Software Technologies Ltd.	15.48

Low Gross Margin Software

Buy Relative Gross Margin Growers, Multiple Expansion, and High Momentum
Sell Relative Gross Margin Shrinkers, High Momentum
End-December, 2021

Long

Ticker	Company Name	Market Cap ($ US. Bil)
IBM	International Business Machines Corporation	119.87
TYL	Tyler Technologies, Inc.	22.04
SSNC	SS&C Technologies Holdings, Inc.	20.84
AKAM	Akamai Technologies, Inc.	19.02
GLOB	Globant S.A.	13.00
JKHY	Jack Henry & Associates, Inc.	12.36
GWRE	Guidewire Software, Inc.	9.46
NEWR	New Relic, Inc.	7.19
RPD	Rapid7, Inc.	6.73
NCR	NCR Corporation	5.30
QTWO	Q2 Holdings, Inc.	4.51
ENV	Envestnet, Inc.	4.34
MNDT	Mandiant, Inc.	4.18
SWCH	Switch, Inc.	4.11
BLKB	Blackbaud, Inc.	3.70

Short

Ticker	Company Name	Market Cap ($ US. Bil)
MSFT	Microsoft Corporation	2525.08
ACN	Accenture plc	262.00
SHOP	Shopify Inc.	173.00
ADP	Automatic Data Processing, Inc.	103.90
CTSH	Cognizant Technology Solutions Corporation	46.60
EPAM	EPAM Systems, Inc.	37.91
IT	Gartner, Inc.	27.49
BR	Broadridge Financial Solutions, Inc.	21.86
GDDY	GoDaddy Inc.	14.10
MANH	Manhattan Associates, Inc.	9.84

SUMMARY AND CONCLUSIONS FOR INDUSTRIALS

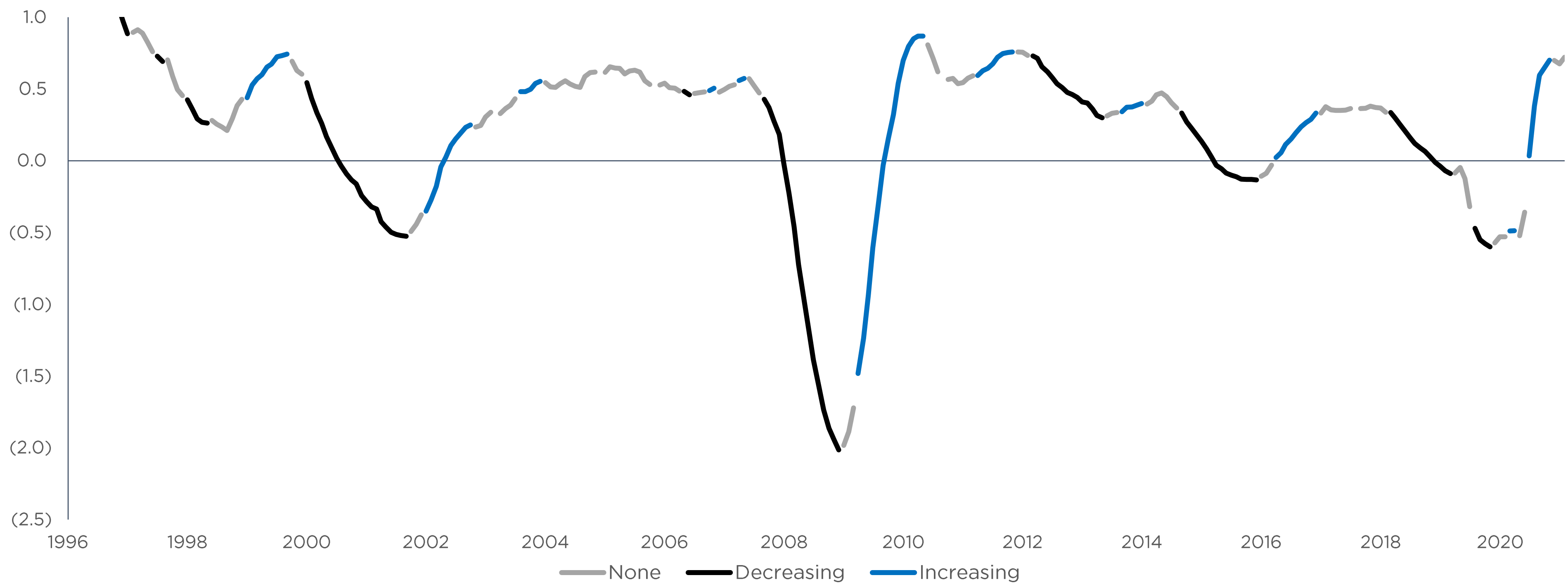
We are negative on the industrials sector relative to the market and would initiate new shorts, or sell down large long positions now

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. In particular, C&I loans, manufacturing capacity utilization, durable goods orders, industrial production, PMI, and North American carloads have all rolled over. Moreover, rising oil has historically improved our stock selection in industrials, driving our confidence in our underweight call.
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.

OUR INDUSTRIAL ACTIVITY GAUGE IS NO LONGER INCREASING

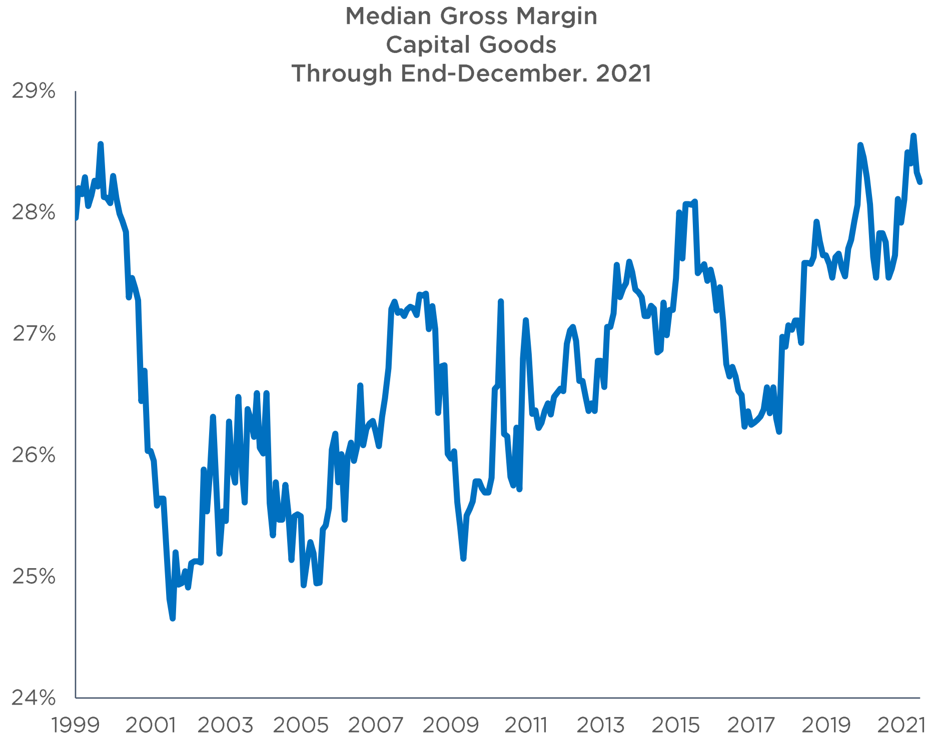
Our industrial activity gauge, which is a broad-based combination of several metrics like C&I loans, Baker Hughes rig count, private nonresidential construction, capacity utilization, new orders of durable goods, PMI, industrial production, and several others show that industrial activity rebounded sharply off the lows of March 2020. However, several signals have begun to roll-over. As of this month, 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.

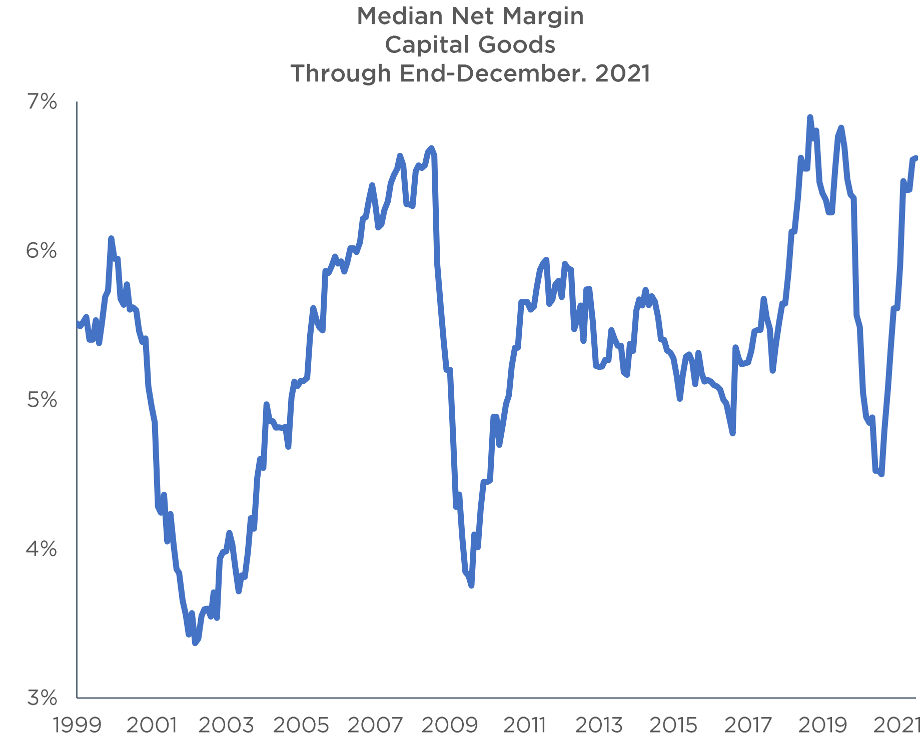
Trivariate's Industrial Activity Signal
Through End-December, 2021



CAPITAL GOODS PROFITABILITY HAS RECOVERED

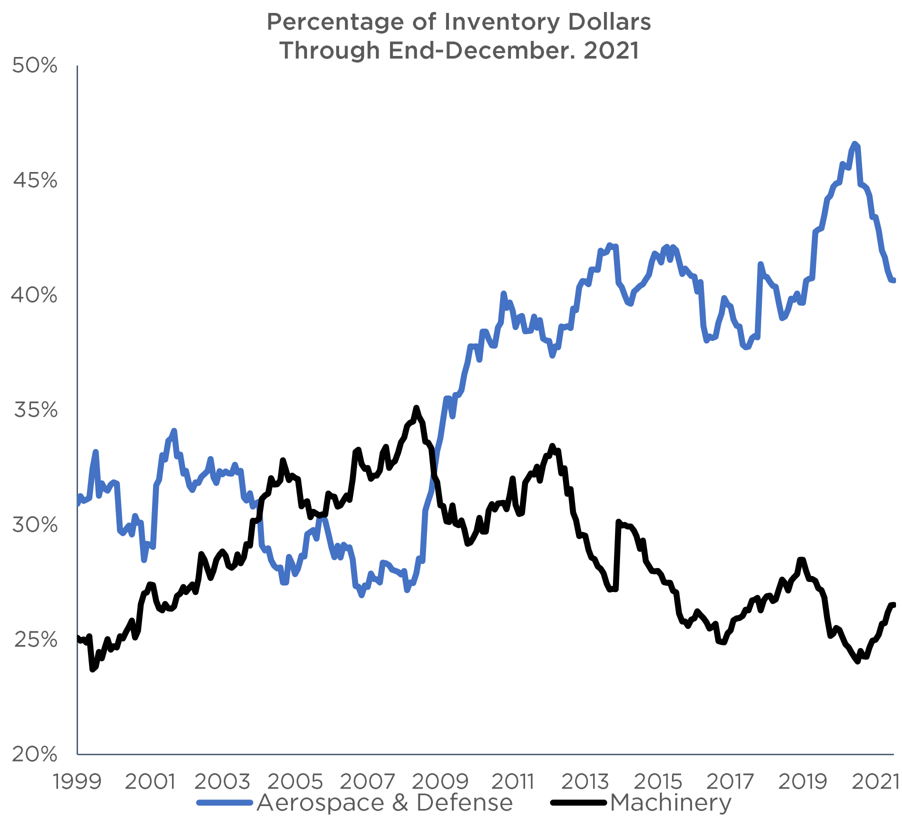
Within industrials, profitability (gross margin) has reached 20-year highs for the Capital Goods industry group, which makes up over 65% of industrials names with market capitalization over $1 billion (left chart). Net margins are also nearing peaks (right chart). With forward estimates for earnings 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.

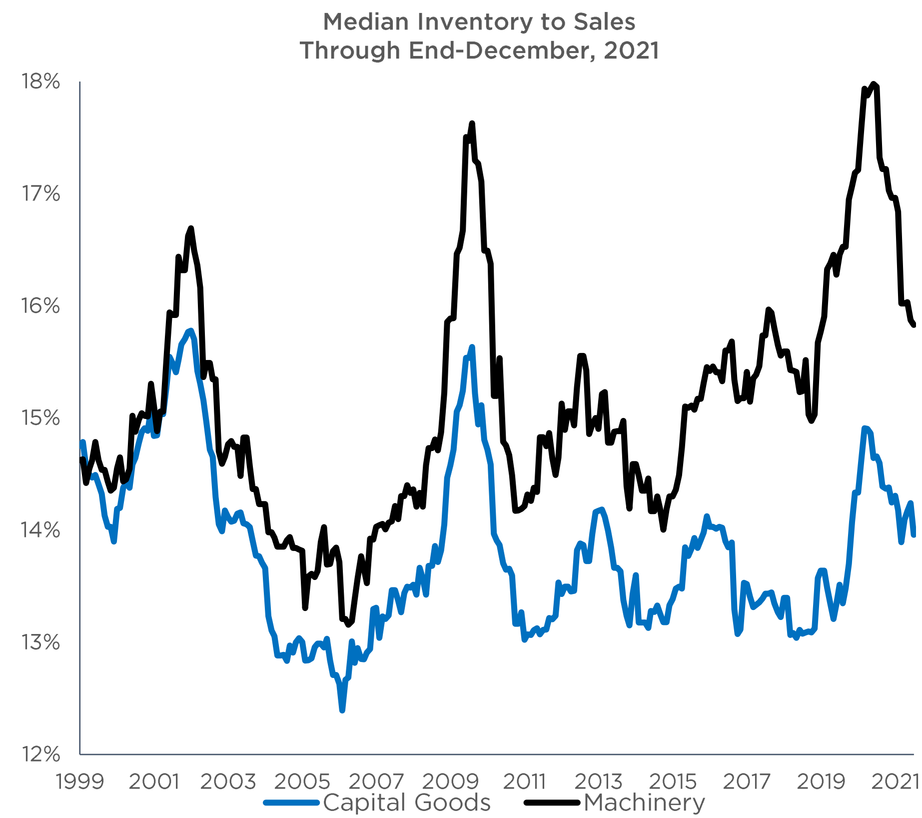




MACHINERY AND CAPITAL GOODS INVENTORY IS NOT LEAN

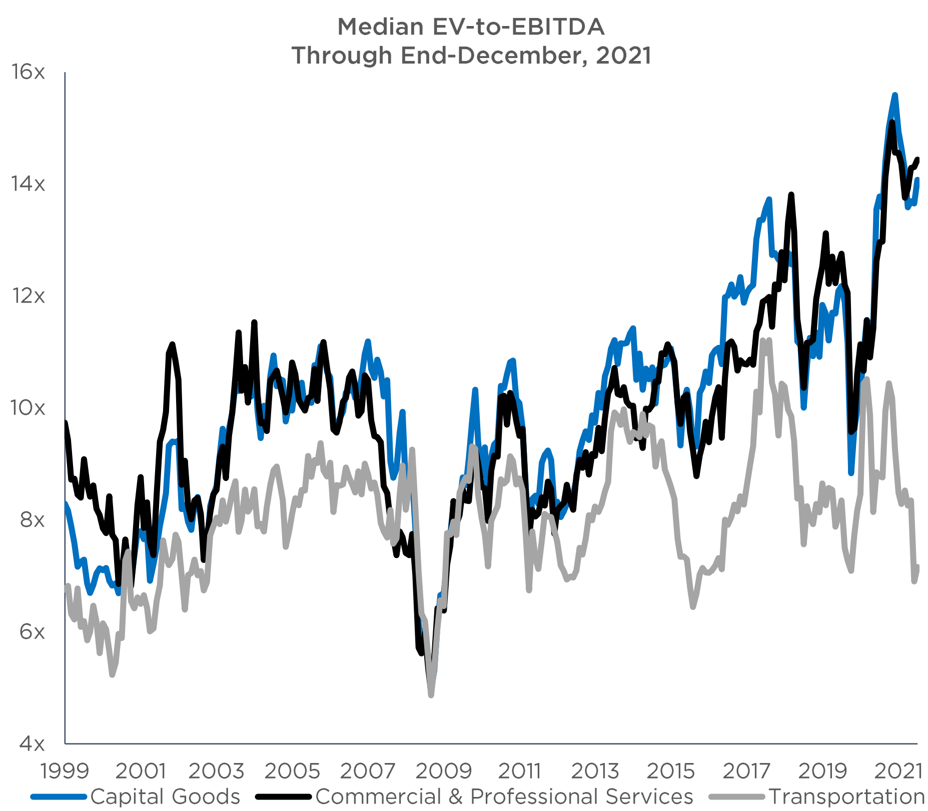
Margin expansion can be helped if inventory levels are low. However, it is not obvious to us that rising factory utilization will drive better cost absorption from here. Aerospace and defense alone make up over 40% of the industrials sector inventory dollars (left chart), making sector-level aggregation of inventory dollars misleading. Capital goods and machinery inventory levels are above pre-COVID levels, even if they've declined recently (right).





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, that is not the case for industrials, with elevated EV-to-EBITDA (left chart) multiples across capital goods and professional services. Conglomerates, commercial and professional services, machinery, and electrical equipment have rarely, if ever, been more expensive (right chart). Airlines and marine are exceptions.

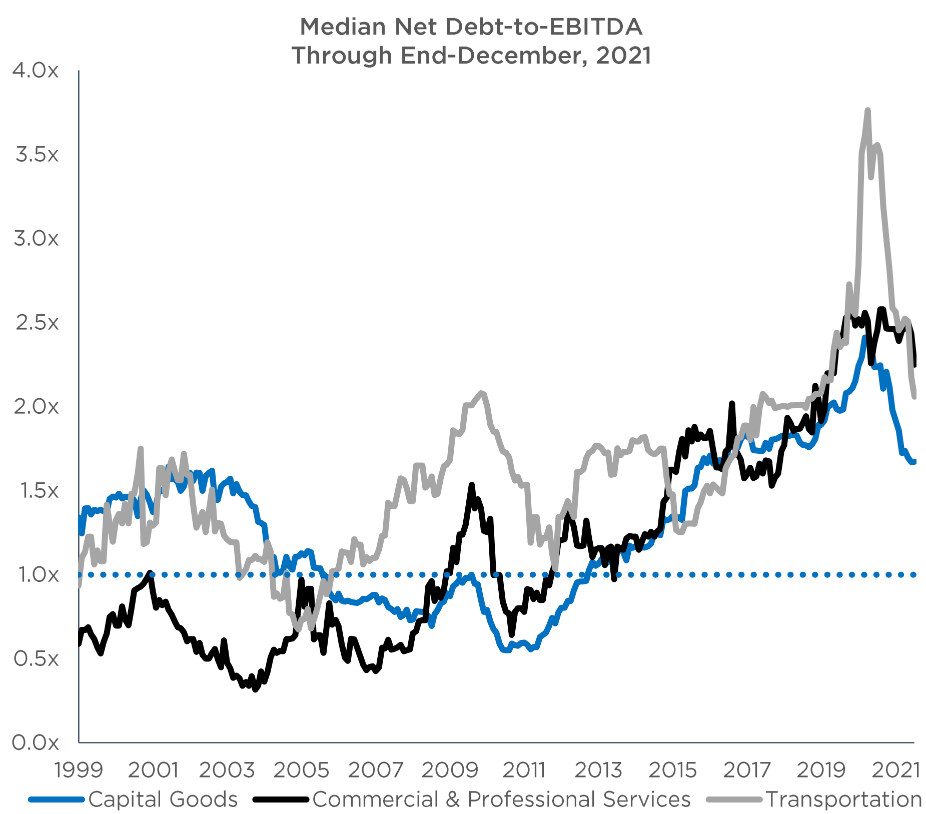


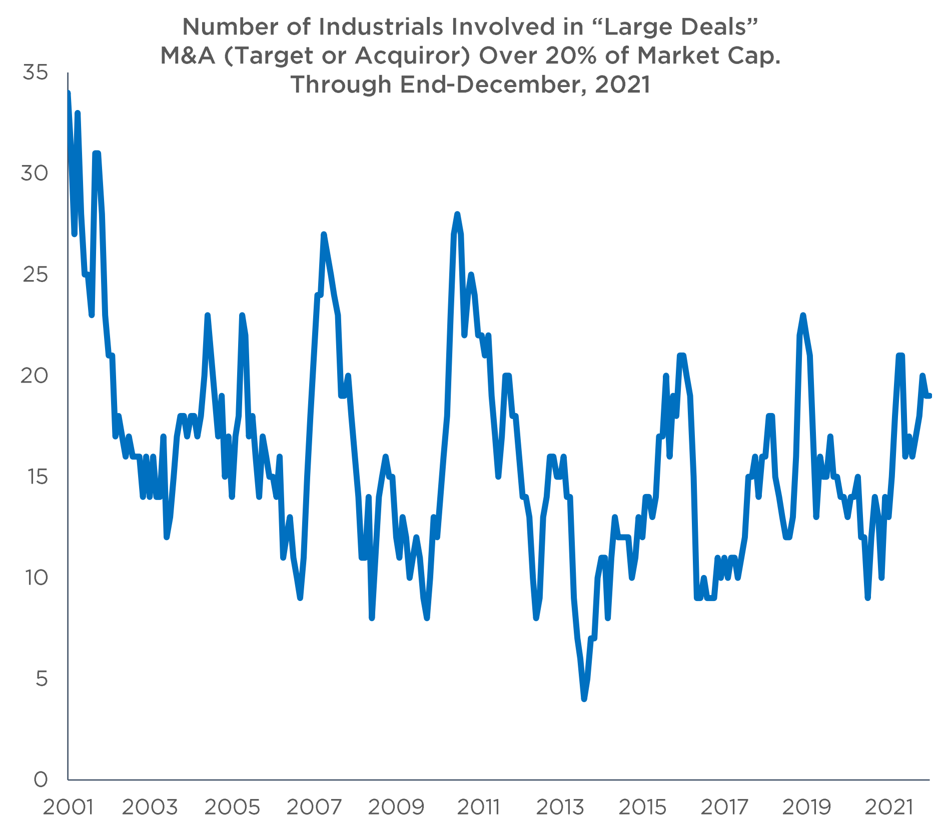
Median EV-to-EBITDA Percentile Rank vs. History End-December, 2021

Industrials GICS Industry	Rank
Building Products	98.9%
Electrical Equipment	98.5%
Trading Companies & Distributors	98.5%
Professional Services	98.1%
Machinery	96.3%
Commercial Services & Supplies	94.4%
Industrial Conglomerates	94.1%
Construction & Engineering	88.1%
Transportation Infrastructure	86.3%
Aerospace & Defense	83.3%
Road & Rail	67.8%
Air Freight & Logistics	52.6%
Marine	10.4%
Airlines	0.7%

LEVERAGE HAS MODESTLY PICKED UP, M&A NOT PARTICULARLY ACTIVE

Elevated valuations can be at least partially justified if balance sheets have massively improved, or if there has been an outsized amount of M&A in a sector. But that is not the case. Companies on average have higher leverage than they did in previous cycles (left chart) and the current number of industrial-sector deals is roughly at a 20-year average (right chart), meaning there is not sector-related euphoria about a rash of imminent deals





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-December, 2021

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
HON	Honeywell International Inc.	Industrial Conglomerates	143.54
CAT	Caterpillar Inc.	Machinery	111.83
CTAS	Cintas Corporation	Commercial Services & Supplies	45.94
PH	Parker-Hannifin Corporation	Machinery	40.88
ROL	Rollins, Inc.	Commercial Services & Supplies	16.83
PNR	Pentair plc	Machinery	12.08
AGCO	AGCO Corporation	Machinery	8.68
CFX	Colfax Corporation	Machinery	7.12
WTS	Watts Water Technologies, Inc.	Machinery	6.53
CR	Crane Co.	Machinery	5.97
AIMC	Altra Industrial Motion Corp.	Machinery	3.35

High Forecasted Incremental Margins vs. Current Gross Margins Bottom Half of Trivariate Quantitative Model End-December, 2021

Ticker	Company	Industry Group	Market Cap. (US$ Bil.)
TT	Trane Technologies plc	Building Products	47.99
SWK	Stanley Black & Decker, Inc.	Machinery	30.75
PCAR	PACCAR Inc	Machinery	30.64
CNHI	CNH Industrial N.V.	Machinery	26.31
IR	Ingersoll Rand Inc.	Machinery	25.22
MAS	Masco Corporation	Building Products	17.14
FBHS	Fortune Brands Home & Security, Inc.	Building Products	14.51
GGG	Graco Inc.	Machinery	13.70
CSL	Carlisle Companies Incorporated	Building Products	12.93
PNR	Pentair plc	Machinery	12.08
ALLE	Allegion plc	Building Products	11.88
LII	Lennox International Inc.	Building Products	11.87
MIDD	The Middleby Corporation	Machinery	10.95

DISCLOSURES

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