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TRIVARIATE RESEARCH

WHAT WILL BE YOUR LEGACY?

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BACKGROUND

What does a CEO want said about them a decade from now when they step down?

We surmise that very high on that “legacy list” is that they were good stewards of capital, and that their decisions about capital use directly benefited shareholders and employees.

Over the past several months we have researched the implications of corporate decision-making, by analyzing various capital uses and their consequences. There is no question that quantitative tightening and rising rates will create different and a potentially higher weighted average cost of capital for businesses.

As such, we felt it was timely to comprehensively evaluate the various capital uses and their consequences over the last full cycle and make a judgment about what will likely matter going forward.

We have broken our analysis into five separate decisions – buybacks, M&A, dividends, investment (capital use and R&D), and leverage.

We analyze each decision separately, in order to examine each corporate action in isolation, though clearly many management teams engage in several, if not all, these activities and balance them when making decisions.

RESEARCH SUMMARY AND CONCLUSIONS

Buybacks: Since the financial crisis, the market has not rewarded buybacks / punished diluters – even companies doing large buybacks of 2.5% or more of net outstanding shares over a three-quarter period have not subsequently outperformed those stocks keeping their share counts relatively flat.

Deals: The initial reaction to a deal matters - \$10b cap or larger companies doing deals that are 20% or more of their market cap lag for up to two years if the initial five-day reaction to a deal is negative but tend to outperform if the initial one-week market reaction is positive.

Dividends: Dividend decisions create more disparate alpha outcomes than buyback decisions – dividend growth is highly effective strategy during a rising rate environment and dividend growth has substantially outperformed an unchanged payout over time.

Capital spending and R&D: Business models and therefore spending and investment vary widely by industry, but generally high and increasing capital intensity is punished. Avoiding high R&D-intensity, small cap, growth stocks has historically been prudent.

Leverage: Heavily indebted companies strongly outperformed this year. Moreover, debt-related metrics have not been effective at picking winners from losers in the last 20 years. We think that will change going forward, with refinancing events at higher rates, and we are cautious on businesses where interest expense is a high percentage of net income.

OUTLINE

Summary of our Capital Use Work and Key Conclusions and Judgments

- Chapter 1: Buybacks
- Chapter 2: M&A
- Chapter 3: Dividends
- Chapter 4: Capital Spending / R&D
- Chapter 5: Leverage

SUMMARY

Capital use decision making really matters – but it varies both structurally and cyclically, and by style, size, sector, and substance. For large baskets of stocks over the last cycle, buybacks and large M&A broadly failed, while dividend expansion was rewarded. High capital intensity was generally punished. Leverage did not matter, but we expect it will in the future.

The Market's Reaction to Capital Uses January 2010 to End-June, 2022

Buybacks	Long Basket	Short Basket	Beta Adj. Returns	Sharpe Ratio
Buybacks vs. No Buybacks	Buybacks	No Buybacks	1.6%	0.29
High vs. Low Buybacks Yield	Top 20% Buyback Yield	Bottom 20% Buyback Yield	2.3%	0.30
Decrease vs. Increase of Shares Outstanding	Decrease in Shares Outstanding	Increase in Shares Outstanding	2.7%	0.44
M&A				
Deals > 20% of Cap. vs. No Large Deals	Deals >20% of Cap	No Large Deals	(2.3%)	(0.33)
Positive vs. Negative Reaction	Deals in Past 1yr w/ Positive Reaction	Deals in Past 1yr w/ Negative Reaction	1.0%	0.08
Dividend Yield				
High Dividend vs. Regular Dividend Yield	High Dividend	Regular Dividend	1.9%	0.32
High Dividend vs. No Dividend	High Dividend	No Dividend	2.7%	0.28
Regular Dividend vs. No Dividend	Regular Dividend	No Dividend	0.8%	0.10
Expanded Dividend vs. No Change	Expanded Dividend	No Change in >12m	1.7%	0.40
No Change vs. Cut	No Change in >12m	Cut Dividend	2.0%	0.12
No Change vs. Cancel	No Change in >12m	Cancelled Dividend	14.6%	0.37
Capital Spending				
Level of Capital Spending-to-Sales	20% w/ Least CapEx	20% w/ Most CapEx	5.5%	0.60
Change in Capital Spending-to-Sales	Top 20% Decrease in CapEx	Top 20% Increase in CapEx	0.8%	0.18
Debt				
Level of Net Debt-to-Market Cap.	20% w/ Least Net Debt	20% w/ Most Net Debt	3.8%	0.31
Change in Net Debt-to-Market Cap.	Top 20% Decrease in Net Debt	Top 20% Increase in Net Debt	1.0%	0.14

TOP 10 SHAREHOLDER CREATORS / DESTROYERS SINCE 1999

On aggregate metric for shareholder creation/destruction is cumulative market cap. creation plus dividends paid, less the cumulative combination of R&D and capital spending for all companies trading from 1999 to today. The biggest value creators and destroyers are shown below. Upon request we can provide information on any of the top 3000 US equities.

Top 10 Value Creators/Destroyers
Market Cap Delta + Dividends Paid – Combined Capex and R&D
As of Mid-July, 2022

Biggest Creators				Biggest Destroyers			
Ticker	Company Name	Industry Group	Market Cap (\$ US. Bil)	Ticker	Company Name	Industry Group	Market Cap (\$ US. Bil)
AAPL	Apple Inc.	Tech Hardware & Equip	2380.35	GE	General Electric Company	Capital Goods	70.09
MSFT	Microsoft Corporation	Software & Services	1901.54	INTC	Intel Corporation	Tech Hardware & Equip	158.27
AMZN	Amazon.com, Inc.	Retailing	1157.44	IBM	International Business Machines Corporation	Tech Hardware & Equip	124.24
UNH	UnitedHealth Group Incorporated	Health Care Equip & Serv	487.26	F	Ford Motor Company	Automobiles & Components	48.08
PG	The Procter & Gamble Company	Household & Personal	343.84	HPQ	HP Inc.	Tech Hardware & Equip	32.55
JNJ	Johnson & Johnson	Pharma/Biotech	458.47	AIG	American International Group, Inc.	Insurance	39.52
HD	The Home Depot, Inc.	Retailing	301.18	T	AT&T Inc.	Telecommunication Services	146.97
TMO	Thermo Fisher Scientific Inc.	Capital Goods	203.86	VZ	Verizon Communications Inc.	Telecommunication Services	211.16
COST	Costco Wholesale Corporation	Retailing	228.74	APA	APA Corporation	Energy	11.22
NKE	NIKE, Inc.	Consumer Dur. & Apparel	163.58	MSI	Motorola Solutions, Inc.	Tech Hardware & Equip	35.45

CHAPTER 1: BUYBACKS HAVE BROADLY FAILED

We evaluated the efficacy of buyback yield as a signal for subsequent return among public companies. Conventional wisdom is that buybacks are a sound strategy for management teams trying to boost their earnings per share growth and subsequent stock performance. Today's research shows this has not historically been an effective strategy for more than a decade.

Since 2009, the performance of the top (Q1) and bottom (Q5) quintile “spread” of buyback yield is roughly zero, with Q5 (diluters) generally performing as well as the Q1 (biggest repurchasers) over the past decade, and better over the last five years. The strong performance of Q5 is in part because growth companies issue stock options and require additional stock offerings to grow. This dynamic occurred in a regime in which growth prevailed, fueling the bottom quintile's strength. However, this does not explain the relative weakness in the first part of 2022.

If buyback yield was an effective metric to predict subsequent stock returns, we would expect to see some differentiation between the quintiles of buyback level.

The clear conclusion is that the market has not rewarded buybacks or punished diluters in aggregate since the financial crisis.

Are the buybacks now all discounted prior to the earnings reports? We assessed the returns on a contemporaneous, instead of forward basis, to see if the market was discounting the buybacks in advance. However, that also does not appear to be rewarded. Perhaps the companies doing the buybacks would have performed even worse without the buybacks, and that is the justification ex-post, but looking six or three months in advance yields even poorer returns than waiting until after the buybacks to buy the stocks doing the most repurchasing.

BUYBACK CONCLUSIONS

Despite this overall lack of quantitative efficacy, when many fundamental analysts pitch a stock, large potential share repurchases are often cited as a potential catalyst. To test this, we evaluated whether large buybacks (5% or more share reduction over a 3-quarter period) result in better stock performance than the companies doing no buybacks or diluting the share base by 5% or more over a 3-quarter period. The answer is by 2% over no buybacks, and 4% over large dilution. **This provides little justification for this capital use, and a special dividend would on average be a superior strategy in our judgment.**

While buybacks across the entire market are not an effective use of shareholder return over the last cycle, we wondered if there were subsets where buybacks are an effective shareholder return strategy. **Buybacks are not effective for mega / large cap stocks, high quality stocks, or value stocks.**

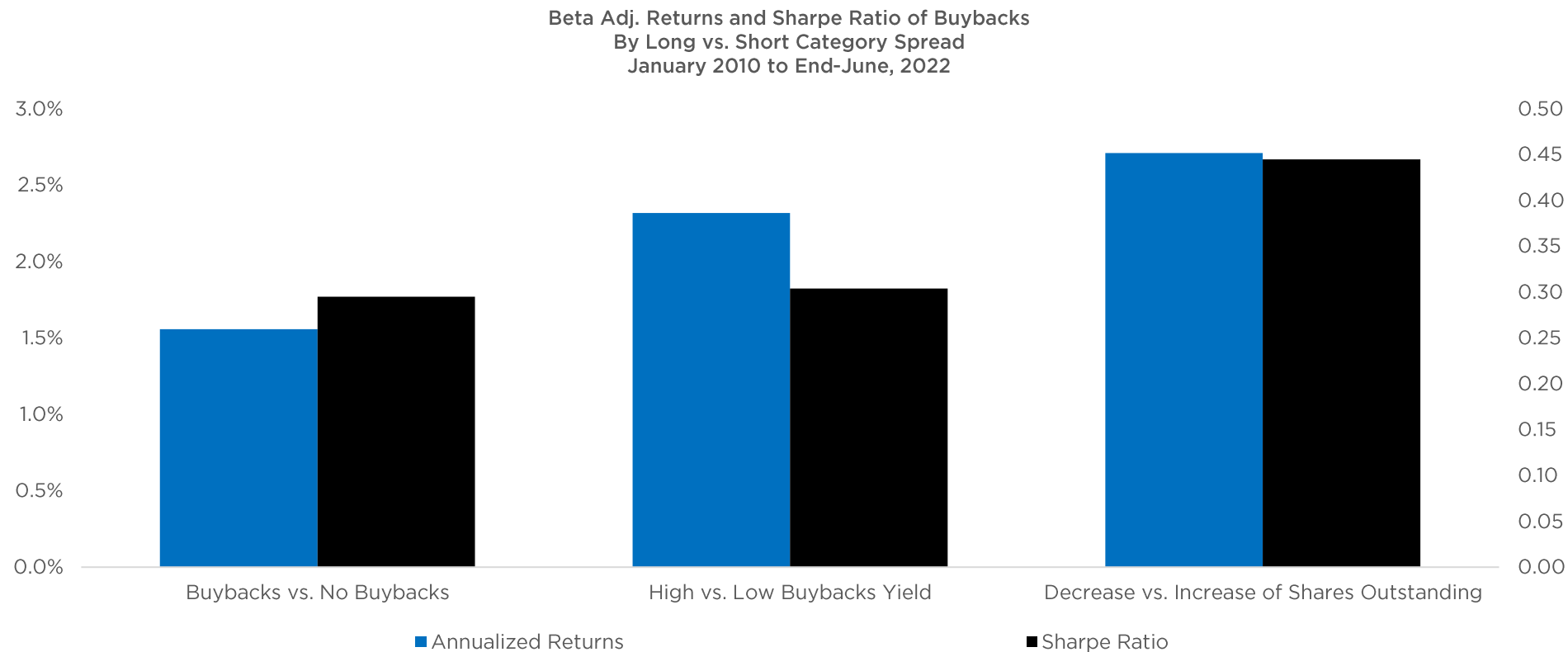
At the industry level, there appears to be some areas where buybacks have been consistently effective, **including durables, transports, and commercial and professional services.** However, in **banks, software and services, and consumer services, buybacks have not been effective.**

There are many companies that have bought back more than 10% of their shares since the beginning of 2019 and are still down in absolute terms. We can provide a full list upon request.

We can also provide a list of stocks where buybacks have been effective (meaning the company bought back their stock at lower prices).

WHAT HAPPENS TO THE SHARE COUNT?

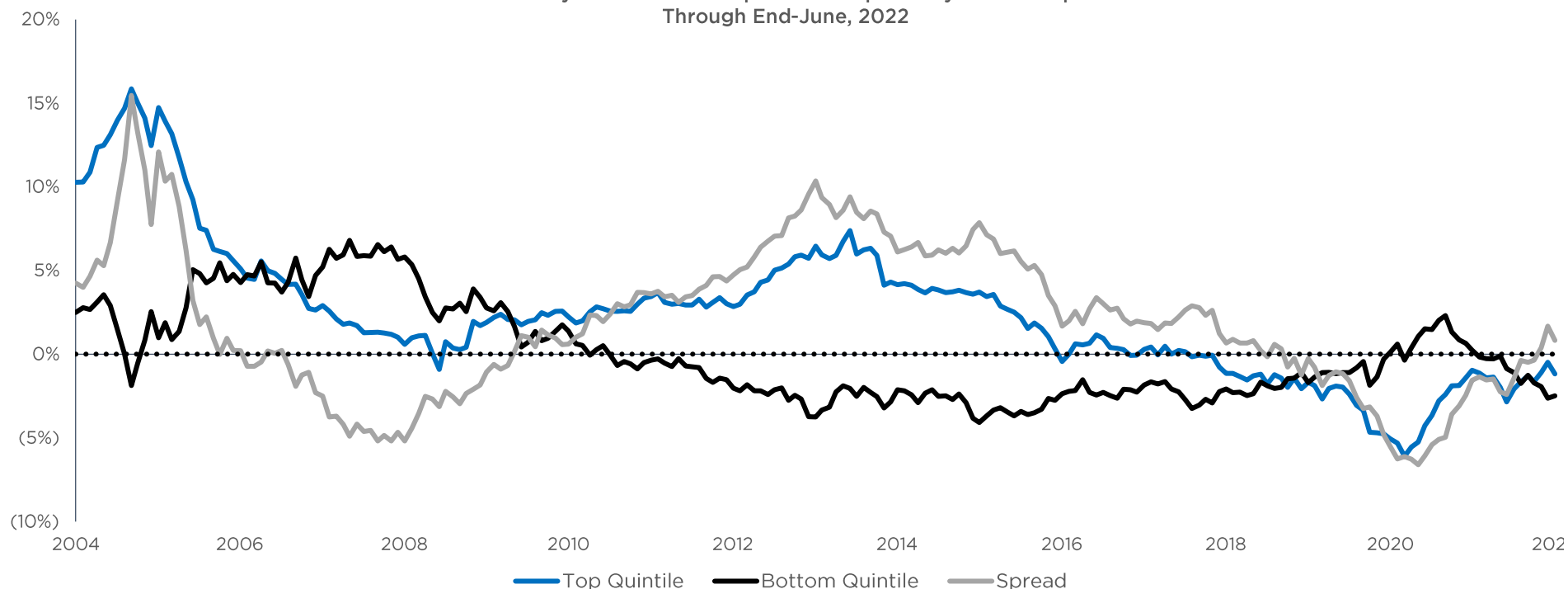
We compared the returns of companies doing high, low or no stock buybacks, and those increasing or decreasing their share counts. Buyback vs. no buybacks (left two bars) show only a small benefit to buybacks. High vs. low buybacks (middle bars) also do not show substantial excess return. Those companies decreasing their shares beat those that had higher share counts by 2.5% per year – though many deployed more absolute dollars toward the reduction than the incremental stock price benefited.



DO STOCK BUYBACKS DRIVE SHAREHOLDER VALUE? ANSWER: NO

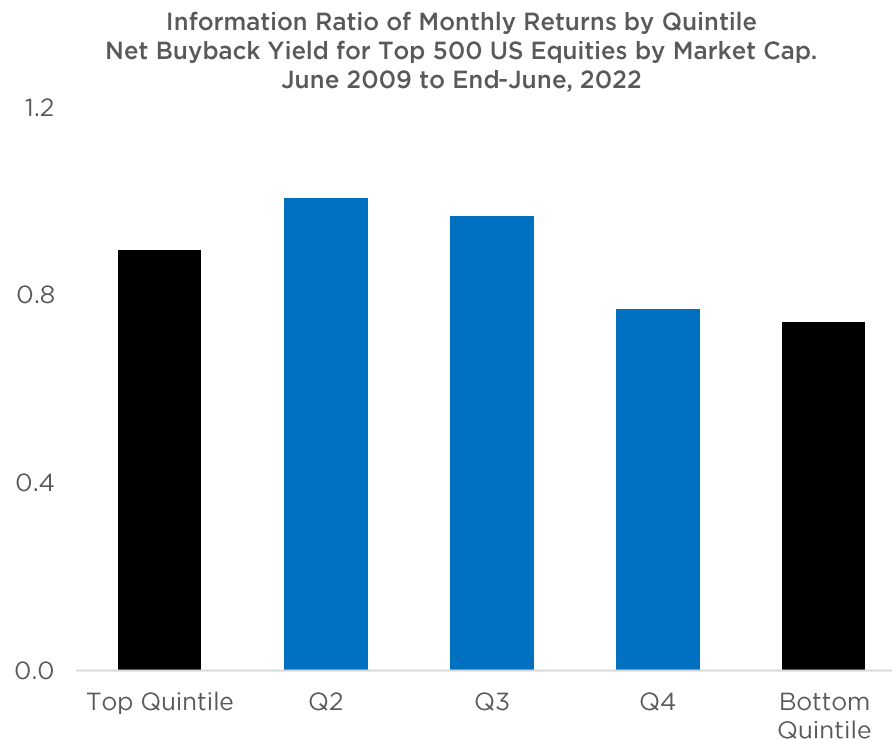
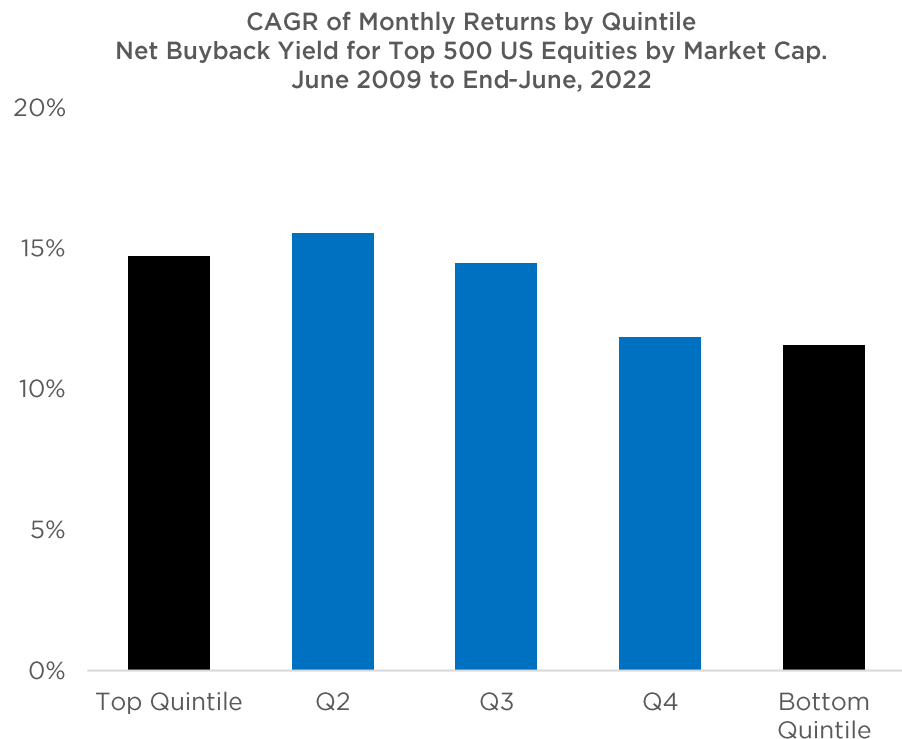
We evaluated the relative performance of SP500 companies in the top quintile of buyback yield (blue line) and bottom quintile of buyback yield (net diluters, black line) over the past 20 years. Buybacks had been an effective use of capital prior the Financial Crisis. However, since then, the performance 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 the top quintile – the market has just not cared about stock buybacks.

Rolling 5-Year CAGR of Monthly Beta-Adjusted Returns
Net Buyback Yield for Top 500 US Equities by Market Cap.
Through End-June, 2022



LITTLE DIFFERENTIATION OF QUINTILES SINCE THE FINANCIAL CRISIS

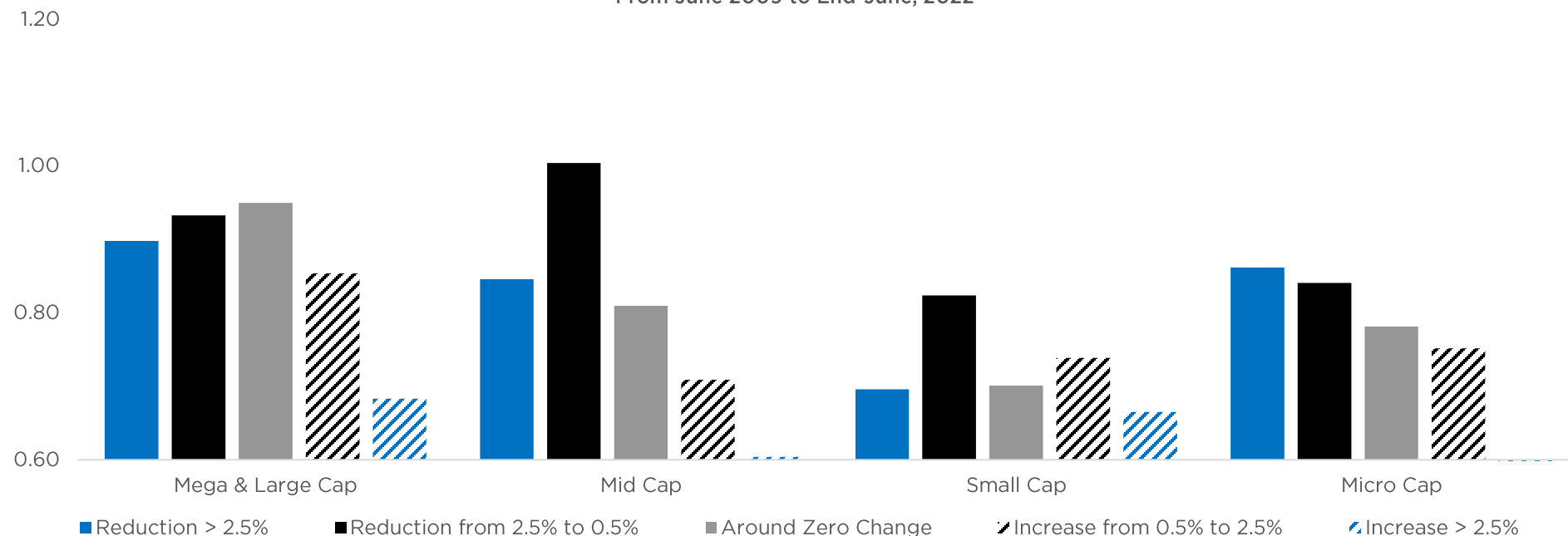
If buyback yield was an effective metric to predict subsequent stock returns, we would expect to see some differentiation between the quintiles. The top quintile of buyback yield (the 100 companies buying back the most stock) have performed in-line with the average company and barely ahead of the biggest diluters since 2009 (left chart). On a volatility-adjusted basis (right chart) this also appears to be true. The clear conclusion is that the market has not rewarded buybacks or punished diluters in aggregate since the financial crisis.



LARGE CAP STOCKS DOING BUYBACKS HAVE WASTED THE MONEY

There is ample evidence that management teams of mega / large cap companies should be questioning the value of large buybacks. On average, they were not rewarded, as big share reductions over a 9-month period resulted in inferior subsequent performance compared to those companies doing no changes to their share count over the same period (left set of bars). Diluters in mid-cap and micro-cap seem to lag companies doing buybacks, but that relationship did not hold for small-caps.

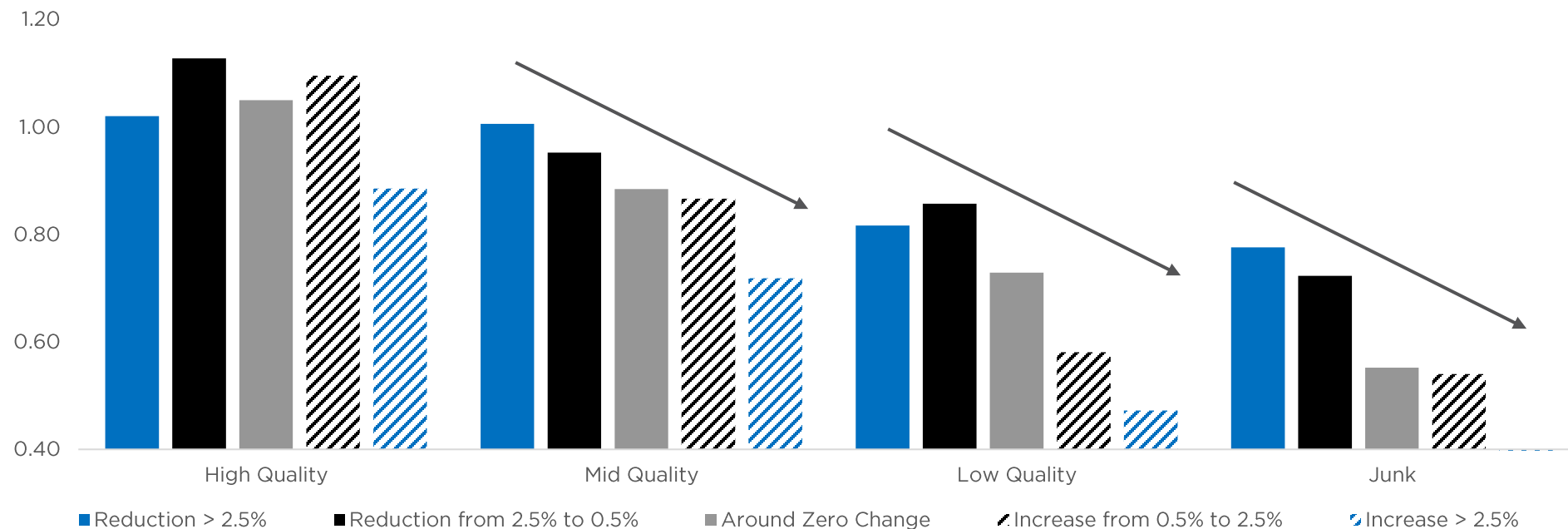
Information Ratio by Size of 9-Month Percent Change in Shares Outstanding
By Size Category
From June 2009 to End-June, 2022



BUYBACKS DO NOT WORK FOR HIGH QUALITY COMPANIES

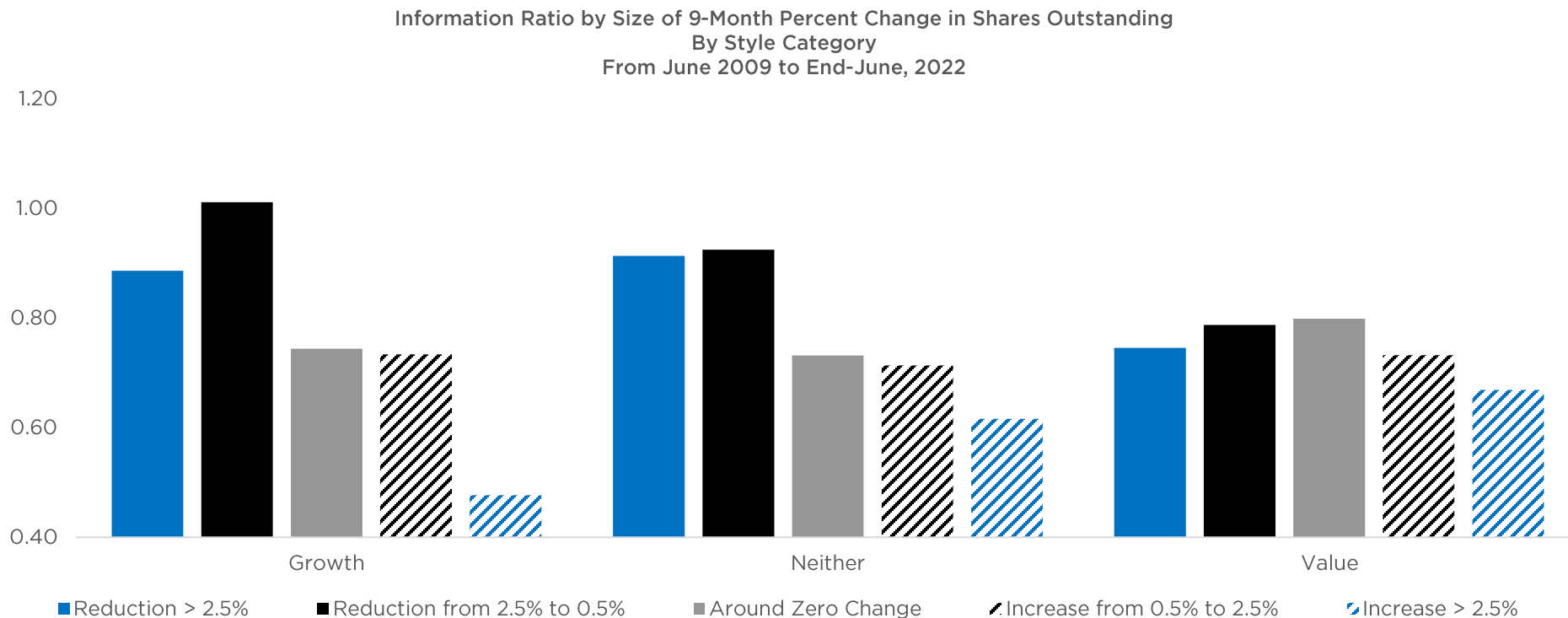
While buybacks across the entire market are not an effective use of shareholder return over the last cycle, we wondered if there were subsets where buybacks are an effective shareholder return strategy. In addition to mega / large caps, the strategy also is particularly weak for high quality companies, with zero differentiation between big reductions vs. modest dilution (0.5% to 2.5%) in share count among that group. However, there does appear to be some modest incremental efficacy for the rest of the groups, as evidenced by the generally higher bars on the left than the right for each other quality bucket (mid, low, and junk).

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



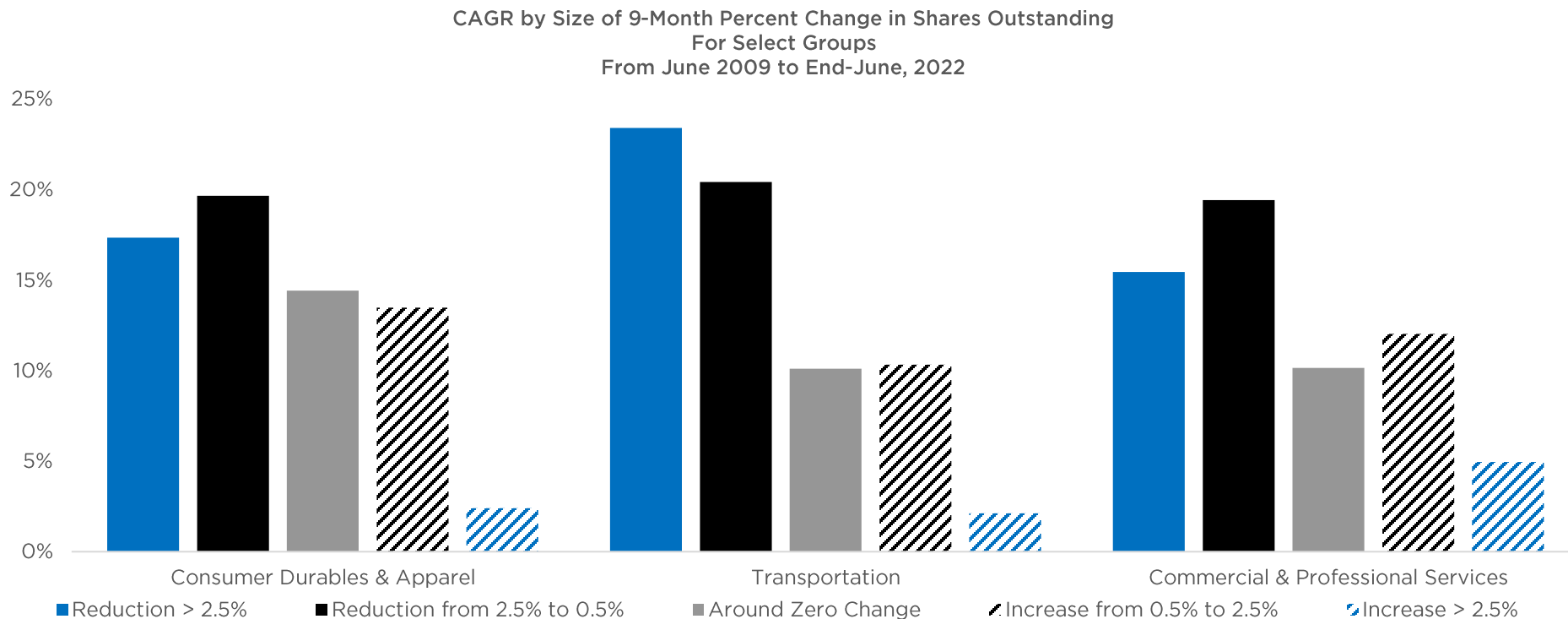
ARE BUYBACKS GOOD FOR SHAREHOLDERS? NOT FOR VALUE STOCKS

We would have guessed that buybacks would be a good strategy for value stocks, as it can often be a meaningful source of EPS growth for that group. However, there is virtually no subsequent performance differentiation among value stocks for big decreases or increases in shares outstanding over a 9-month period (right side of exhibit).



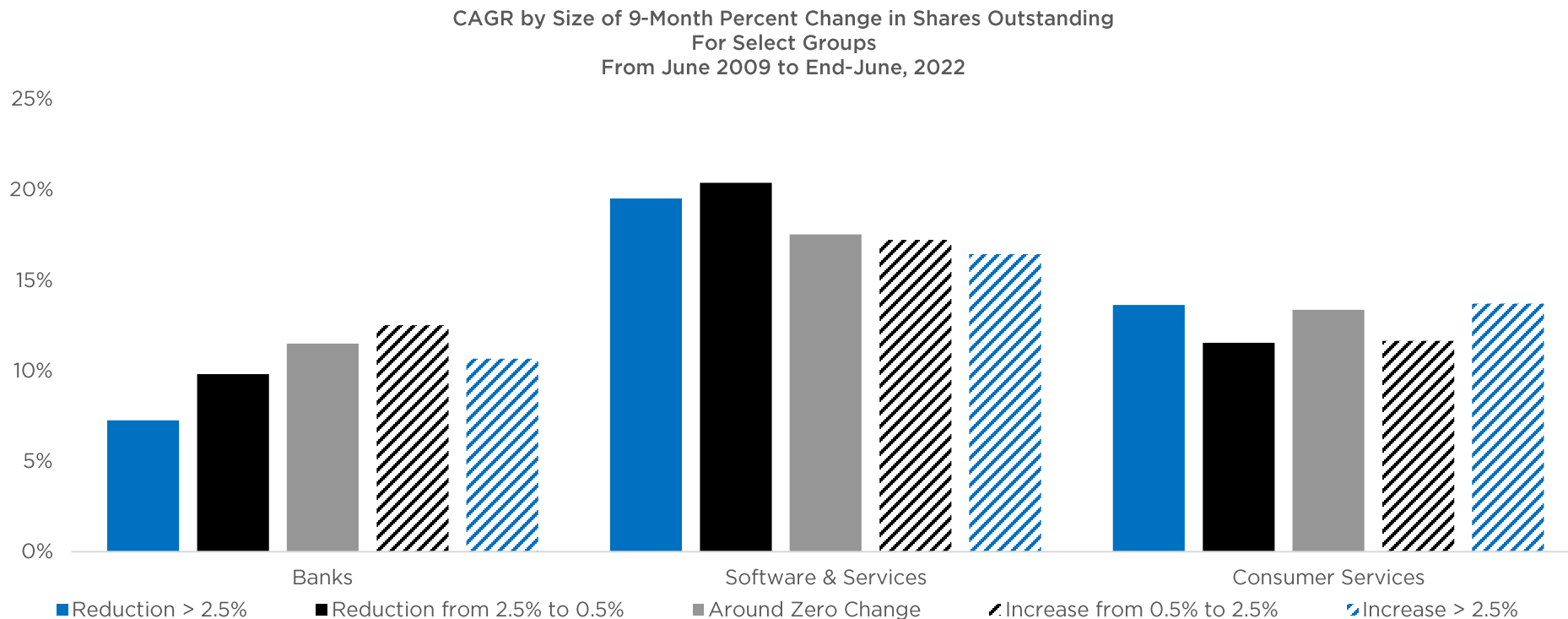
FOR DURABLES, TRANSPORTS, PROF. SERVICES BUYBACKS WORK

We analyzed the efficacy of buybacks at the industry level and found there are several industries where this has been a good strategy since 2009. Consumer durables and apparel, transportation, and commercial services generally show a pattern where stocks doing net buybacks meaningfully beat stocks that are net diluters. This might be because these are cyclical businesses where the management teams have excess cash to deploy even in downturns.



FOR BANKS, SOFTWARE, AND CONSUMER SERVICES BUYBACKS FAIL

The focus on comprehensive annual reviews (CCAR) for large cap banks where shareholder return is earned through balance sheet improvement made us think that buybacks would have been an effective use of capital for banks since the financial crisis. It has not, as there are so many small banks, and diluters perform as well as those buying back meaningful amounts of stock (left group). There has been little difference for software & services companies, and consumer services diluting their shares over a 9-month period have not performed better (right group of bars).



CHAPTER 2: M&A

With investors frequently asking us about the impact of M&A and potential break-ups (i.e., JNJ, GE, K), we decided to research the deal landscape, evaluate the subsequent performance of the acquirers as the ultimate gauge of success, and search for attributes of winners and losers.

Current landscape: M&A volume is typically weak when there are recession fears and a risk-off environment. **The total number of deals that are 10% or more of the acquirer's market capitalization looks poised to be the lowest in 20 years.** The average deal size among the few deals is slightly higher than the long-term average of 5%.

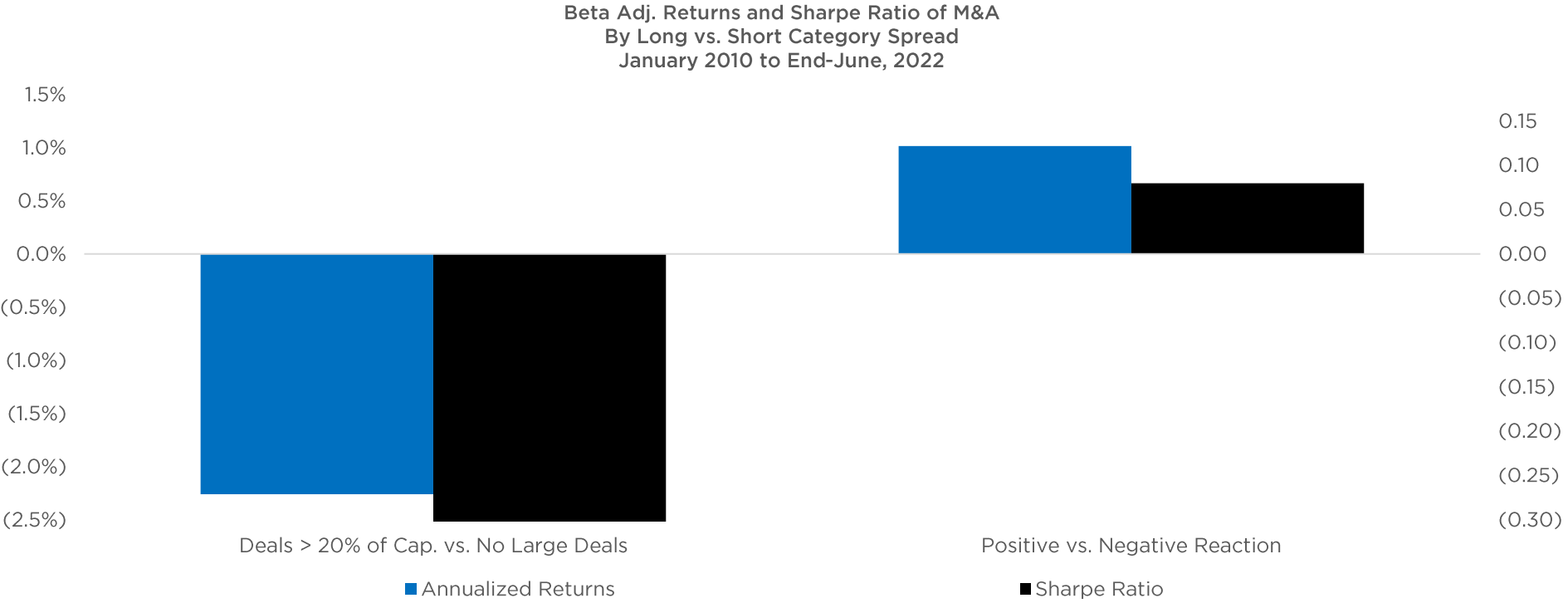
Small acquiror's lag: The larger acquirers doing deals (20% or more of their market capitalization) subsequently perform better than companies smaller than \$10 billion market cap, as the hurdles and costs of integration for smaller businesses are less obvious.

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. For acquirers \$1 to \$10 billion we 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 five months for the acquirers. For companies greater than \$10 bn. market cap. doing deals that are 20% or more of their size, the initial reaction is also a strong indicator of subsequent performance, with a negative reaction lasting for two years, and a positive one for 18-months.

Value stocks and banks: The five-day beta-adjusted return following a deal announcement is particularly relevant in value stocks, where the M&A is often done for changing the growth or profit profile. For banks, all of the performance (negative or positive) is accrued in the first five trading days.

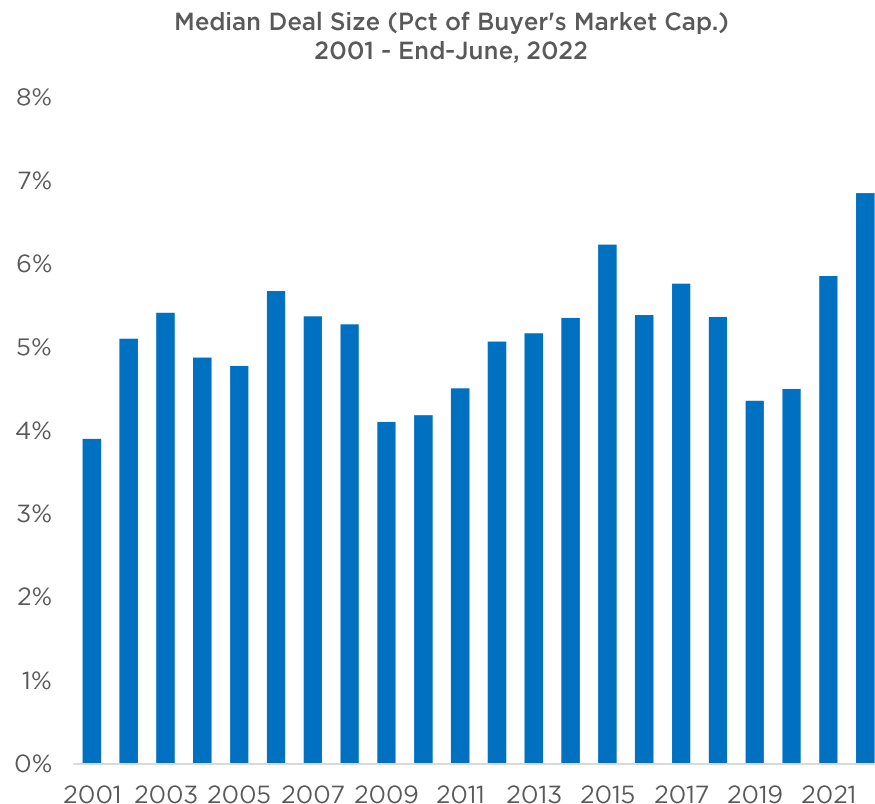
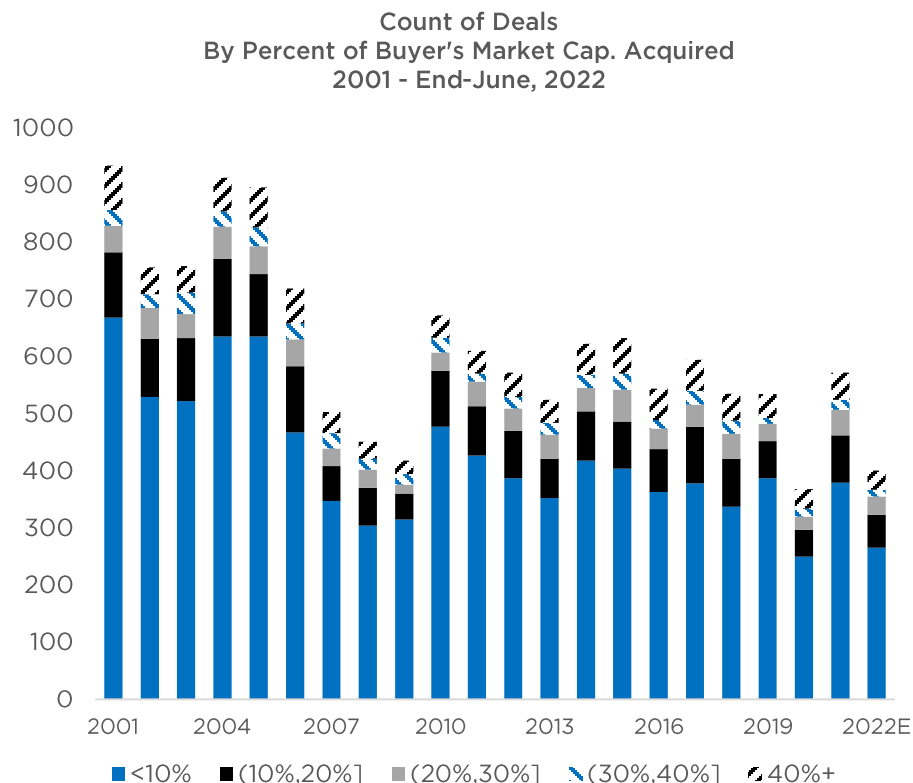
COMPANIES DOING LARGE DEALS HAVE LAGGED

We show both the beta-adjusted returns and the volatility of those return streams for companies engaging in deals, and those not doing deals. Those doing deals greater than 20% of the market capitalization have lagged those doing no deals by 2% per year this cycle (left side). Those with a positive initial 5-day post-announcement (right side) beat those that have a negative initial market reaction.



THE OVERALL M&A MARKET IS HISTORICALLY WEAK THIS YEAR

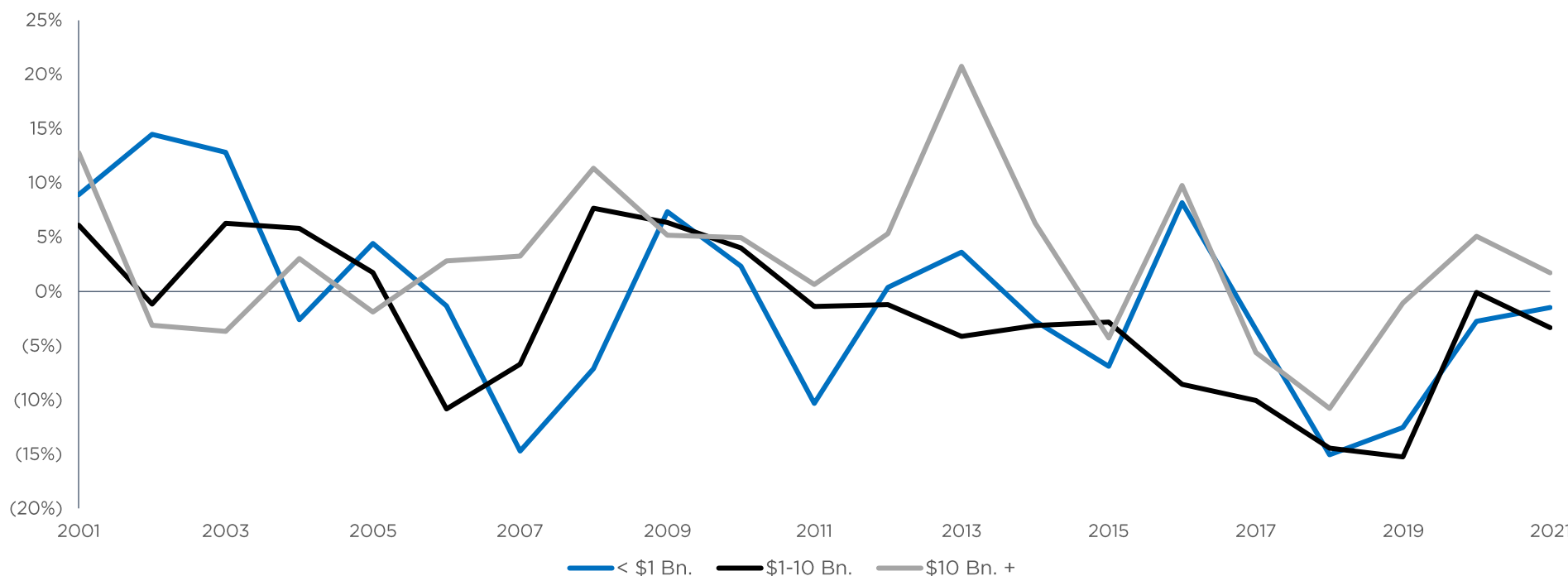
The total number of deals that are 10% or more of the acquirer's market capitalization (left chart) could be the lowest in 20 years. The average deal size is slightly above the long-term average of 5% (right chart) of the acquirer's market capitalization.



LARGER BUYERS GENERALLY PERFORM BETTER

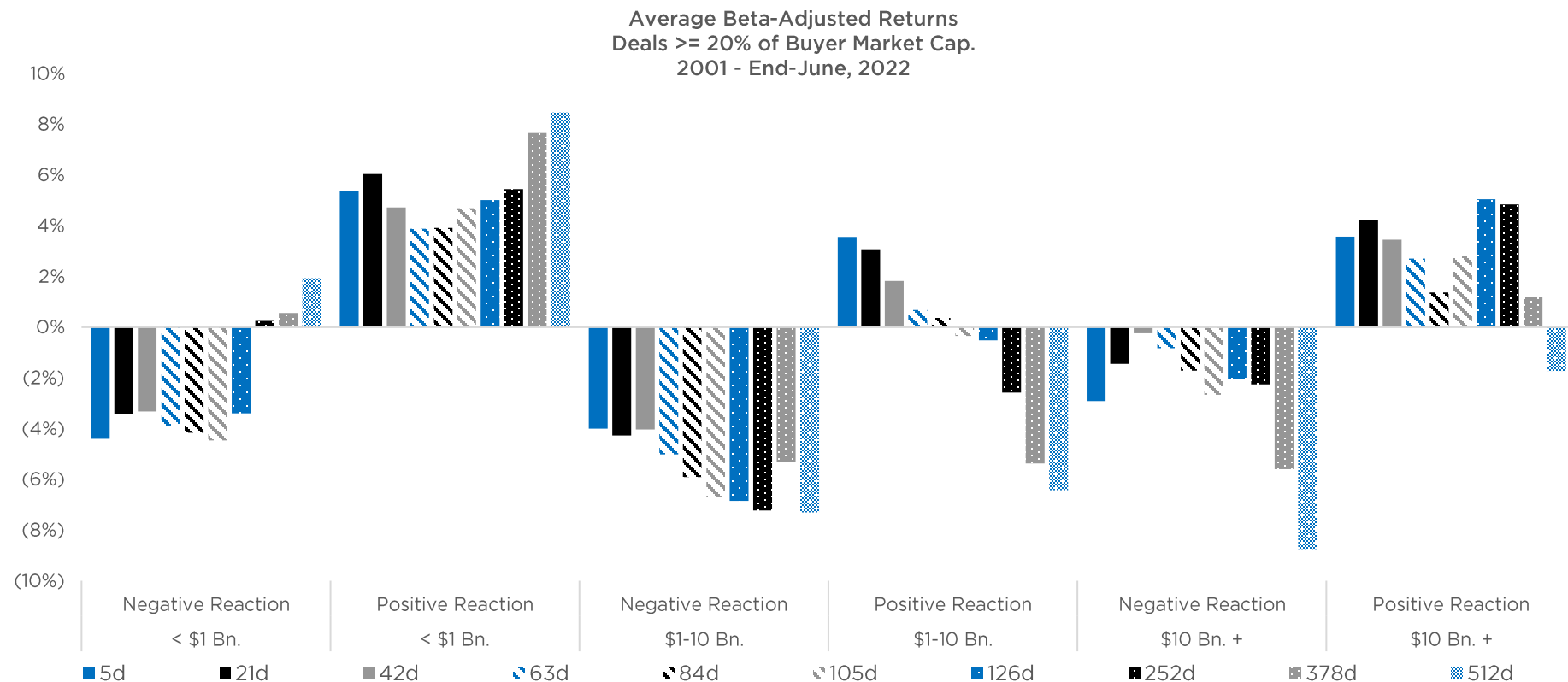
We looked at the size of acquirer, and generally the larger companies buying companies that are 20% or more of their market capitalization subsequently perform better. Companies that are less than \$1 billion market capitalization typically lag.

Average 6-Month Beta-Adjusted Returns
By Size of Buyer, for Deals $\geq 20\%$ of Buyer's Market Cap.
2001 - End-June, 2022



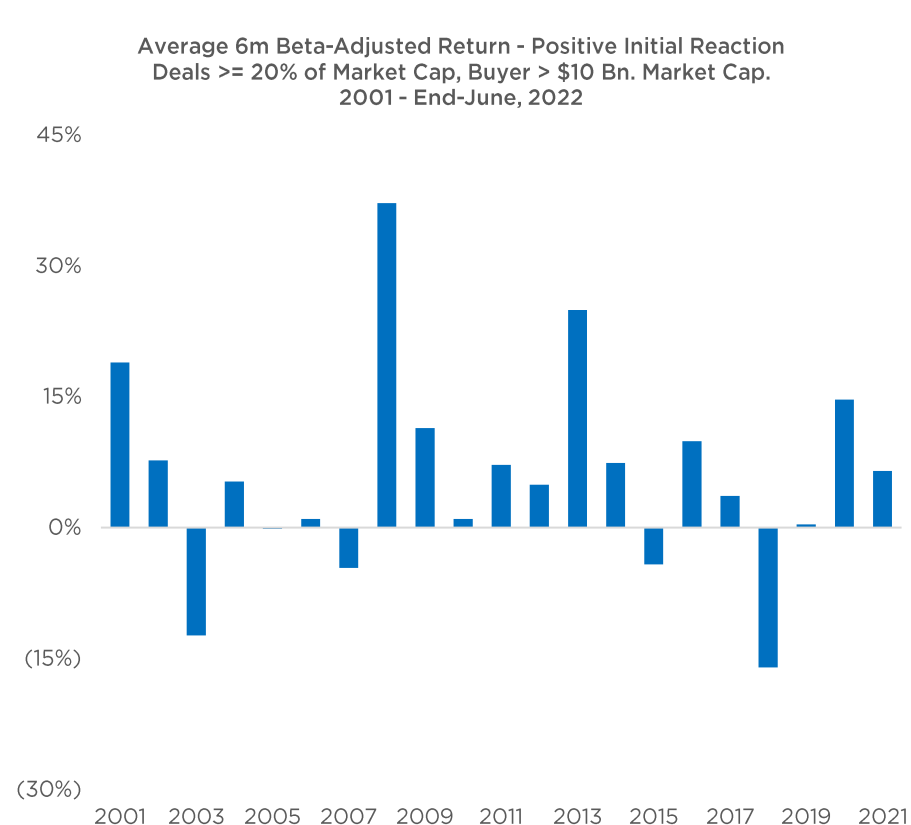
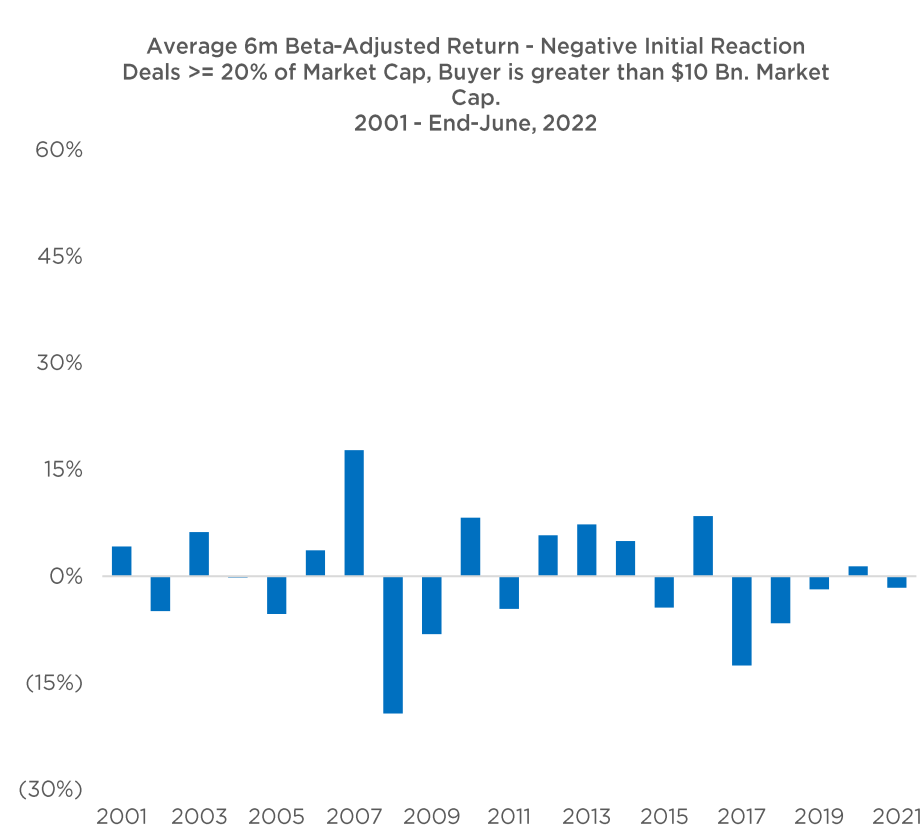
FIRST IMPRESSIONS MATTER

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 five months for the acquirers. On the right we show deals for companies bigger than \$10 billion. The initial reaction is powerful if it is negative, and more mixed if it is positive beyond the initial five-day post-announcement move.



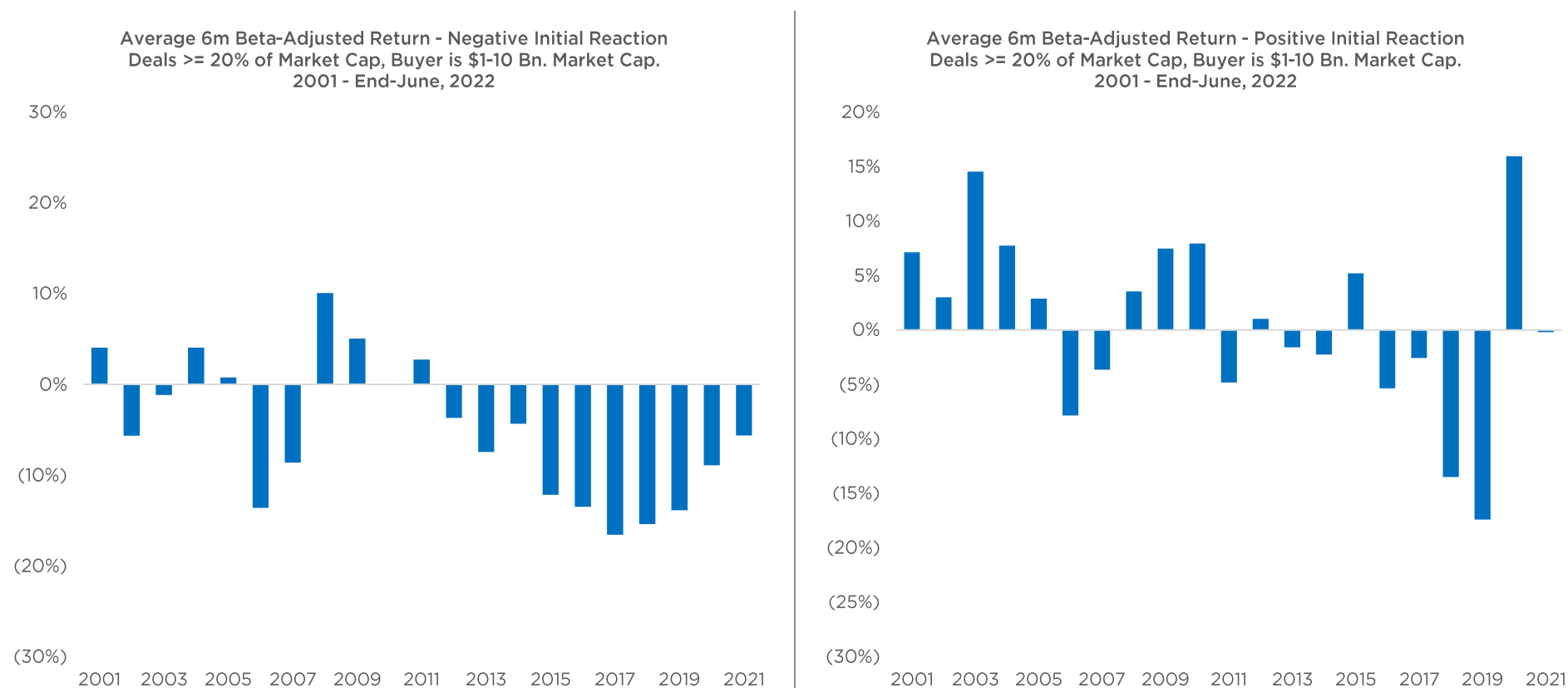
THE FIRST IMPRESSION MATTERS FOR LARGE-CAP DEALMAKERS

An initial negative reaction for a large cap stock that made an acquisition of 20% or more of its market cap (left chart) was consistently a harbinger of subsequent weakness. For stocks where there was an initial positive reaction in the large cap universe (right chart) there was subsequent positive returns in all but three of the last 20 years.



MID-CAP ACQUIRERS ARE NOT USUALLY GOOD STOCKS

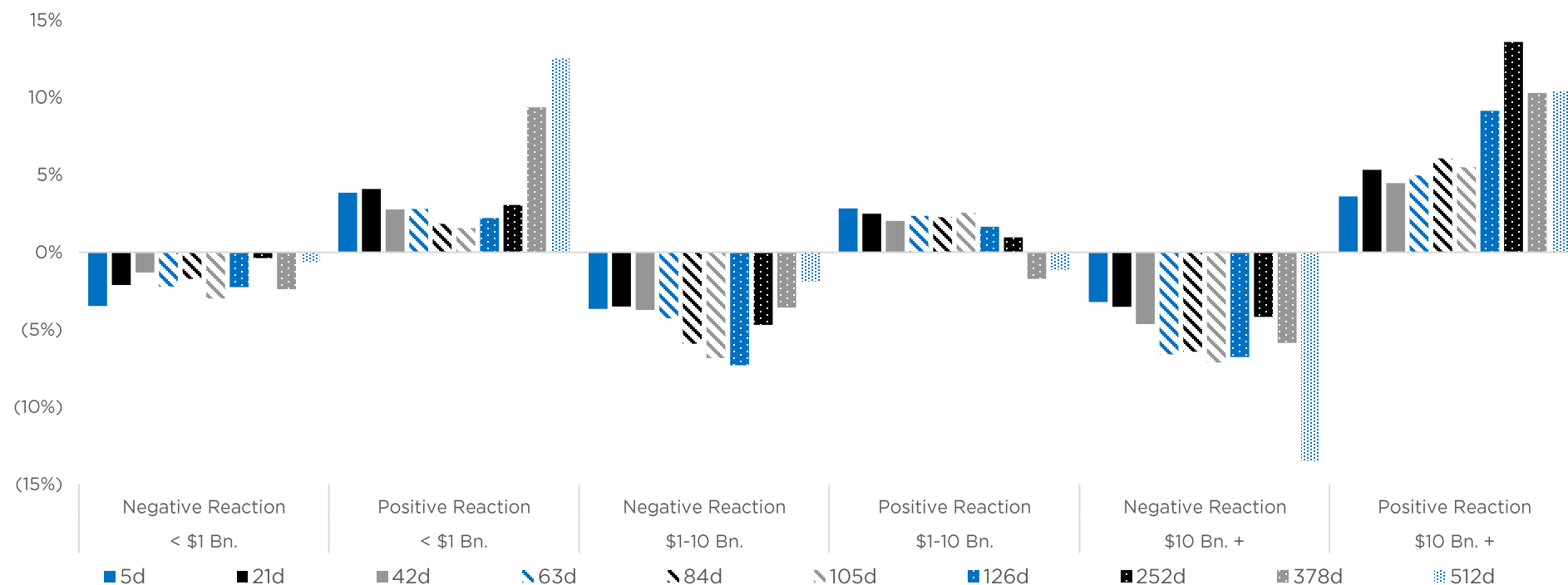
Acquirers between \$1 and \$10 billion capitalization doing deals that are more than 20% of their market capitalization generally have not subsequently performed well over the last two decades. For twelve straight years, stocks with an initial negative reaction lagged the market for the next six months (left chart). Even those with an initial positive reaction have underperformed in eight of the last ten years (right chart).



THE INITIAL REACTION TO M&A IS CRUCIAL FOR VALUE STOCKS

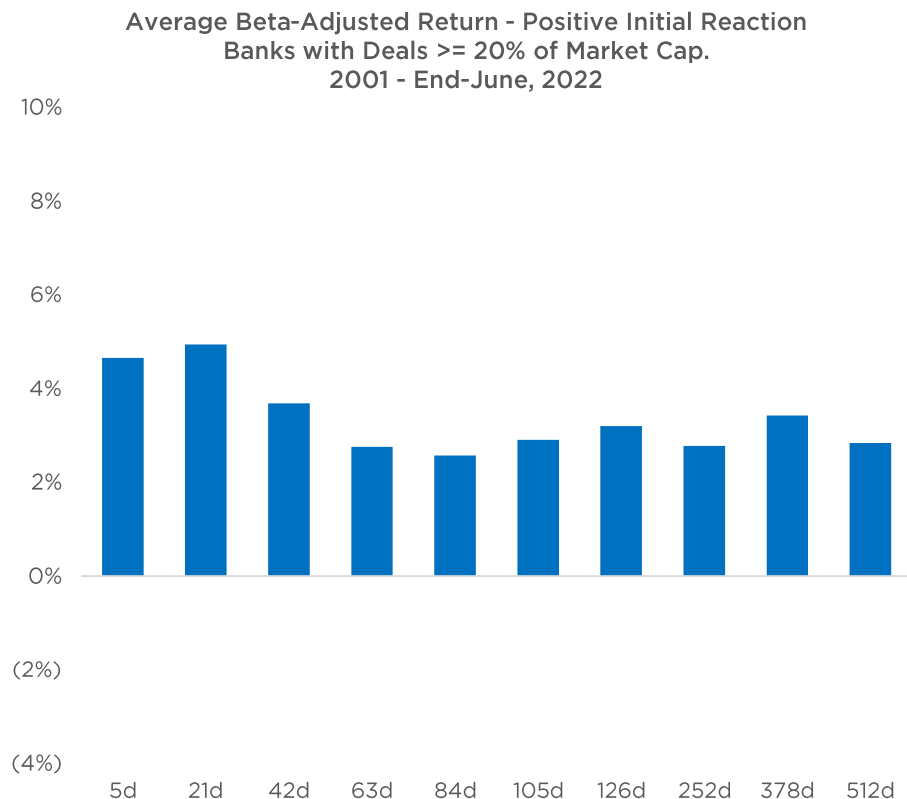
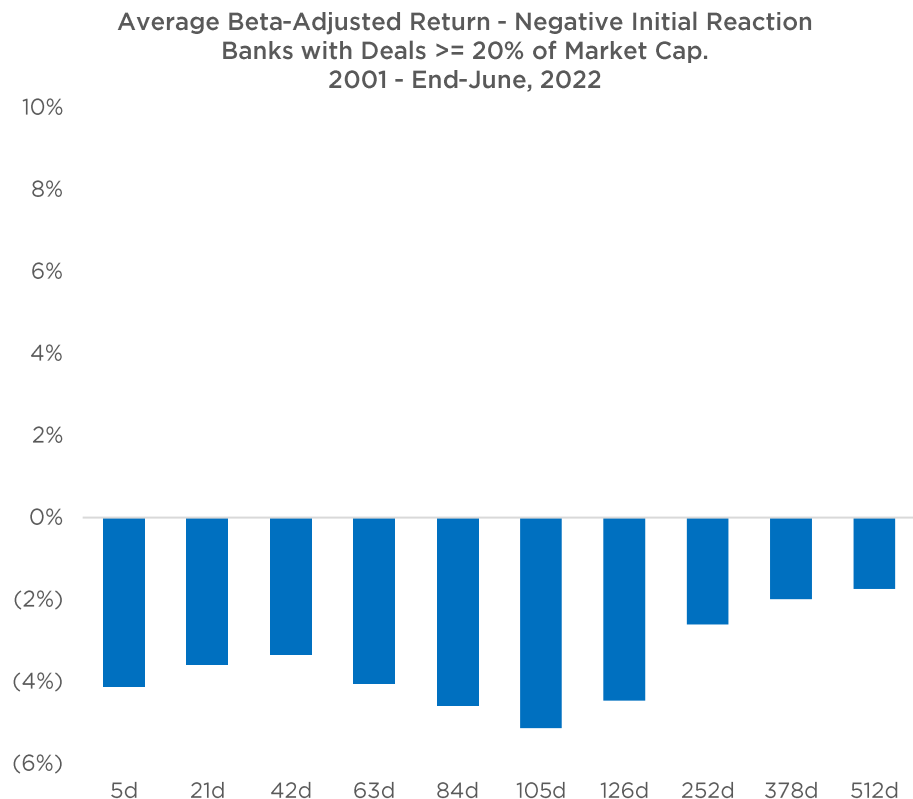
Companies with suppressed valuations often seek acquisitions in order to change their growth trajectory or drive margin expansion. The market's initial reaction is particularly strong for value stocks doing deals more than 20% of their market capitalization, with the subsequent performance for companies greater than \$10b market cap. continuing in the direction of the initial five-day reaction for two years. The effect is even stronger for value stocks than for the rest of the market.

Average Beta-Adjusted Returns for Value Stocks
Deals $\geq 20\%$ of Buyer Market Cap.
2001 - End-June, 2022



THE INITIAL MARKET REACTION TO BANK DEALS IS ALL THAT MATTERS

We analyzed the initial market reaction (five days) for banks, noting that this is still a highly fragmented business where future consolidation is likely. Banks engaging acquisitions larger than 20% of their market cap. where the initial reaction is negative basically perform in-line for the next two years – all of the underperformance is immediate (left chart). Those with initial positive reactions also essentially perform in-line for the next two years (right chart), meaning the basket of large bank acquirors really generates no alpha beyond the initial reaction.



CHAPTER 3: DIVIDENDS

Dividend-related strategies seem particularly relevant today given the shift in the perception about the path of interest rates. After a record number of cancelled dividends in 2020, we are now seeing more companies expand their dividend.

Now is the time to investigate dividends as a strategy given the hawkish Fed and wide valuation dispersion among dividend-yielding stocks (signaling potential opportunity). Moreover, and a potential surprise to some, a basket of dividend-expanding stocks has outperformed our hyper-growth universe since 2010, meaning investors may not realize the sustained excellence of this investment approach.

Clearly, the market rewards companies initiating a dividend, and dividend expanders more than cutters or cancellers. Our work shows that **what companies do with their dividend has a big impact on their long-term performance, whereas what they do with their buyback does not create as disparate a set of future outcomes.**

Context: Slightly fewer than 50% of the top 3000 US equities offer a dividend today. The market has always paid lower multiples for higher dividend yielding companies, because in aggregate they grow slower or see fewer organic growth opportunities. However, the valuation discrepancy among the companies with dividends has materially widened in the last two years with high yielders near 20-year lows on relative price-to-forward earnings.

Bottom line: Growing the dividend through the hiking cycle seems by far the best strategy. Having your yield above your peer-group (level) did not help in general. If you have no dividend now, initiating a dividend has resulted in subsequent outperformance. Cutting the dividend, or even leaving it unchanged was generally penalized.

CONCLUSIONS

Dividend expansion and initiation: We studied the short-term behavior of companies initiating or expanding their dividends since 1999. Expanders continued to outperform for three weeks after their dividend increase in aggregate, even though they also outperformed on average prior to the announcement. This indicates that it is not too late on average to invest following the announcement. Similarly, companies that initiate a dividend, continue to outperform for 15 days following the announcement. Over the long-term, outperformance continues for expanders for 18 months on average, even though many strongly outperform the 1.5 years prior to the expansion. Those that initiate a dividend also perform well beforehand, but alpha peaks earlier for cutters than for expanders. We analyzed several strategies this cycle and found a basket of dividend expanders beat the Nasdaq, hyper growth stocks, or a combination of growth and dividend expander, making this an underappreciated strategy in our view.

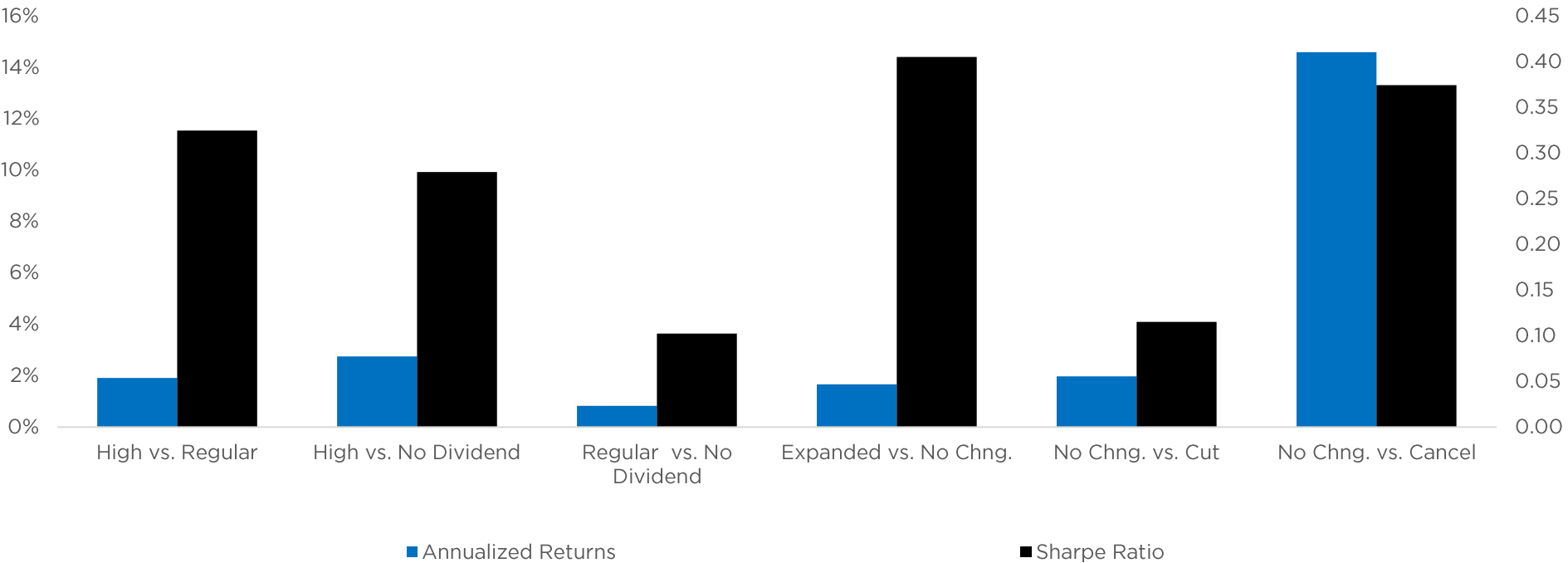
Dividend cut and cancellation: Similarly, it is not too late to sell dividend cutters / cancellers following their announcement. Stocks that announce a dividend cut lag prior to their announcement, but trough nine days after the information is released. Dividend cancellers lag by 200bps on a beta-adjusted basis for the ten trading days prior to announcing a cut, then also lag another 150bps after the announcement. Dividend cutters and cancellers STRONGLY underperform prior to their announcements and drag negative alpha for about five months more for both on average. Cancellers (who survive) start to beat the market by nine months after their announcement.

Stock picking methodology and ideas: We have two quantitative models that specifically forecast returns among high dividend-yielding stocks, one for junk and one for everything else. Our non-junk high yield model is more focused on income statement and stability. Please let us know if you want stock ideas from our models.

MARKET REACTIONS VARY TO DIVIDEND STRATEGIES

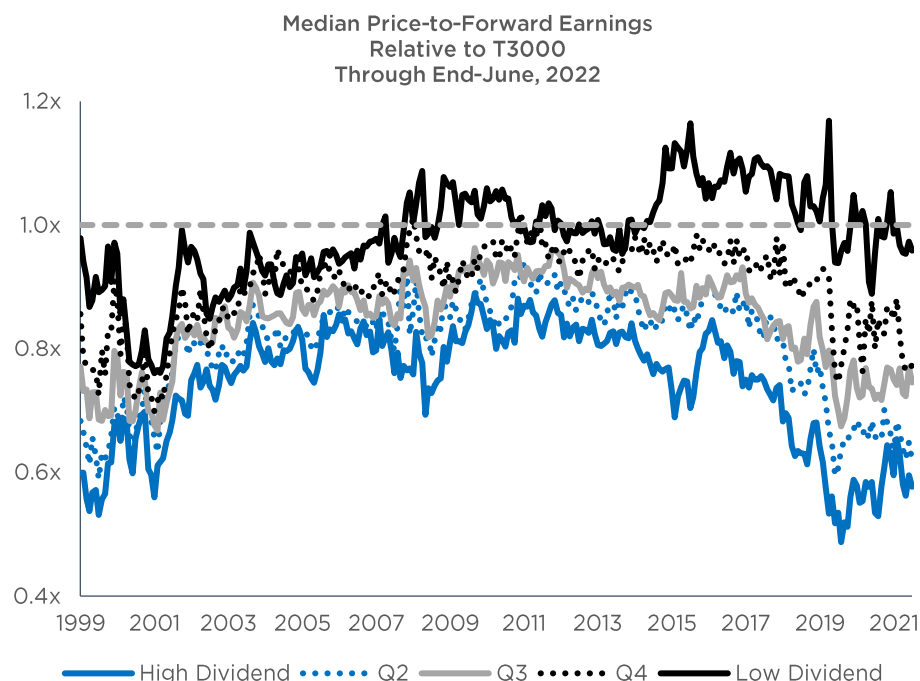
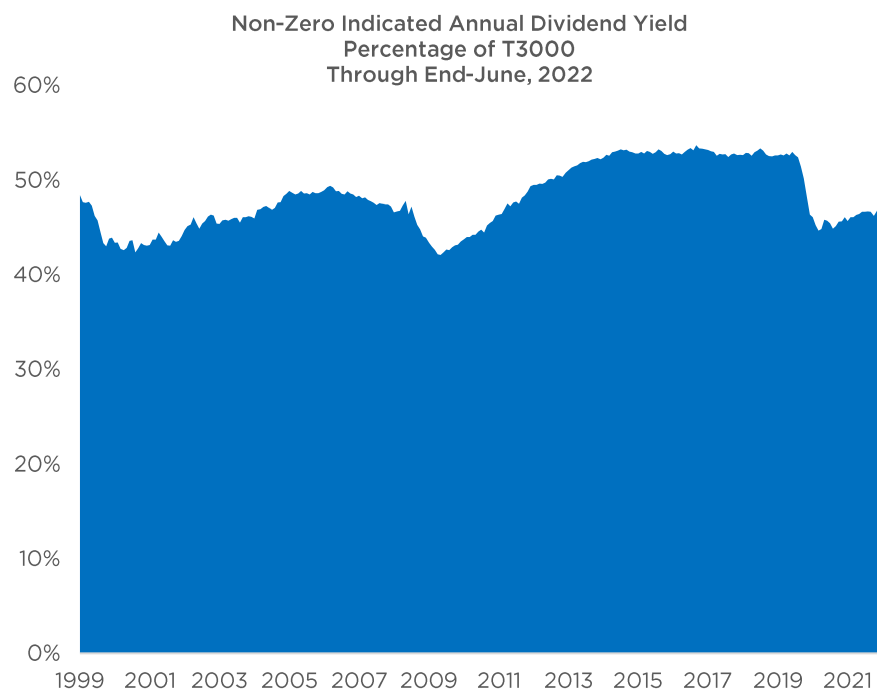
We evaluated the subsequent return of stocks with various dividend strategies. High yielding stocks vs. those with a regular yield (meaning positive but not high) and high vs. no dividend. Returns were slightly better for the high yielders. Stocks with a regular dividend did not really outperform stocks with no dividend this cycle, largely due to the strength of growth stocks for much of the period. Stocks expanding their dividend had a lot of volatility vs. those leaving their dividend unchanged, but in aggregate only modestly outperformed. Those that cancelled their dividend lagged materially, though those that cut but didn't cancel only modestly underperformed.

Beta Adj. Returns and Sharpe Ratio of Dividend Yield
By Long vs. Short Category Spread
January 2010 to End-June, 2022



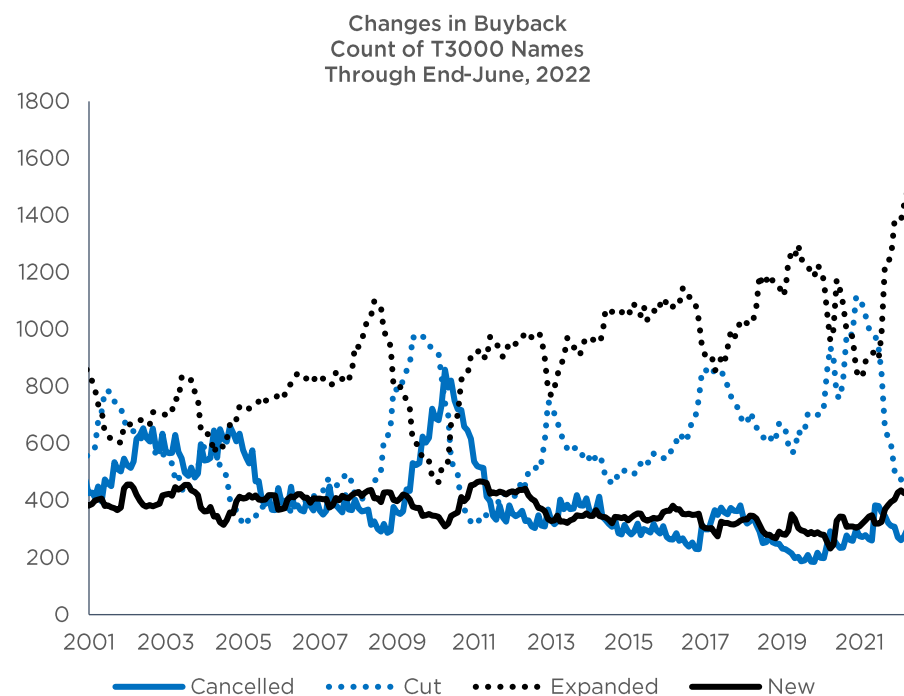
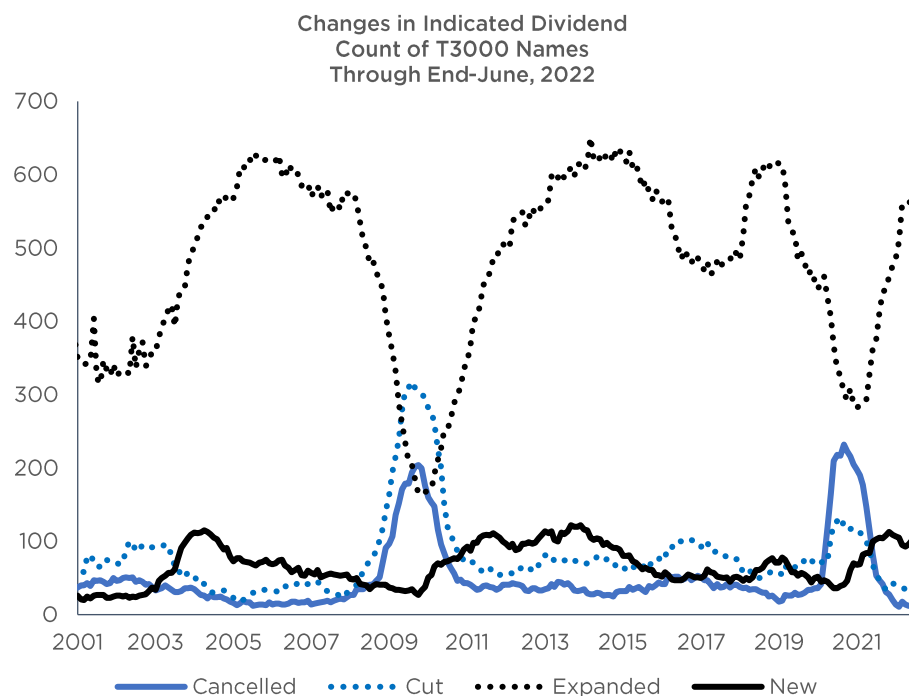
THE HIGHER THE DIVIDEND, THE LOWER THE MULTIPLE

With the massive shift in perception of rates, we decided to look in detail at dividend-related strategies and the market's reward and penalties. For context, slightly fewer than 50% of the top 3000 US equities offer a dividend today (left chart). Several cancelled during the worst part of COVID, lowering the percentage from where it remained steady through the second half of last decade. The market has always paid lower multiples for higher dividend yielding companies, because in aggregate they grow slower or see fewer organic growth opportunities. But the valuation discrepancy among the companies with dividends has materially widened in the last two years (right chart) with high-yielders near 20-year lows on relative price-to-forward earnings.



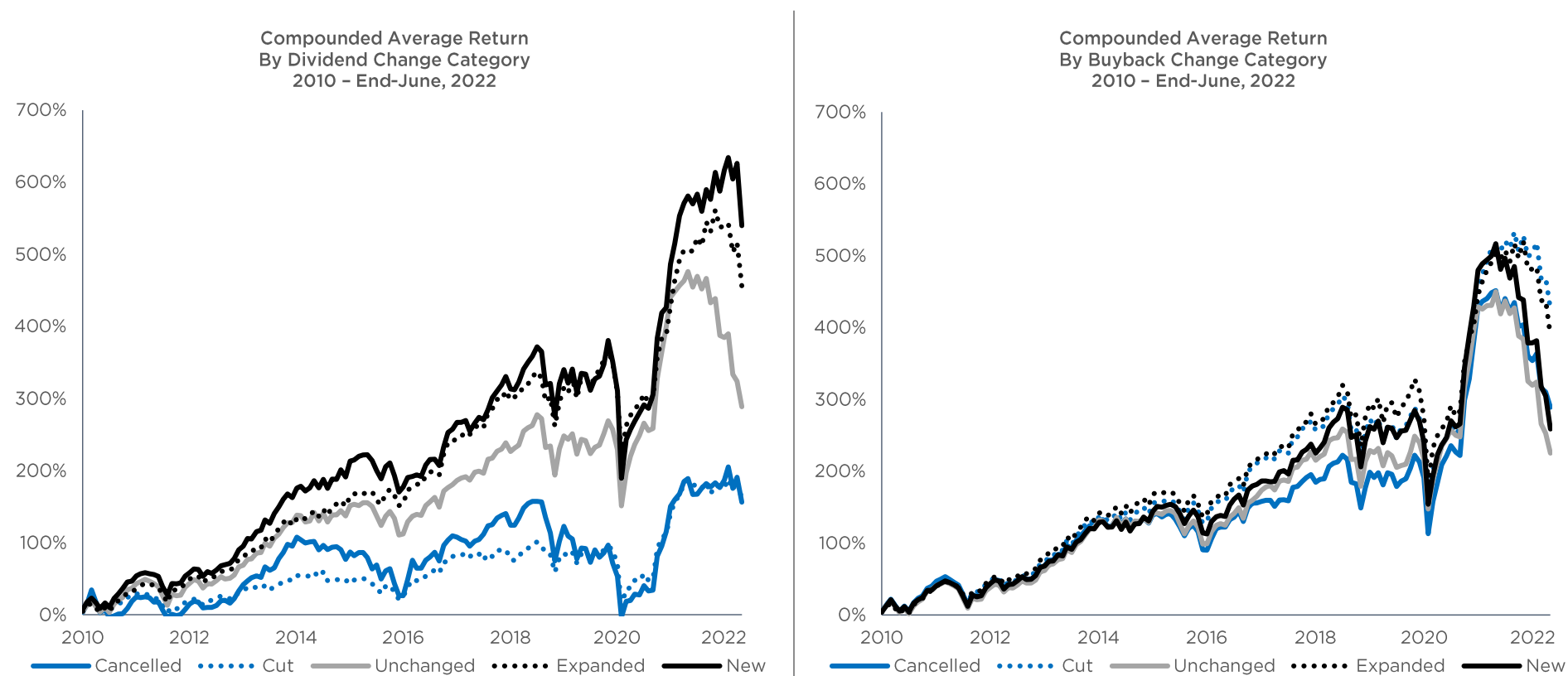
BEHAVIOR RHYMES 2009 WITH RECORD BUYBACK GROWTH TODAY

After a record number of cancelled dividends in 2020, we are now seeing more companies expand their dividends again (left). A record number are also increasing their buybacks (right). We also saw this behavior following the financial crisis, but **we have never had more companies increasing their buybacks than today**.



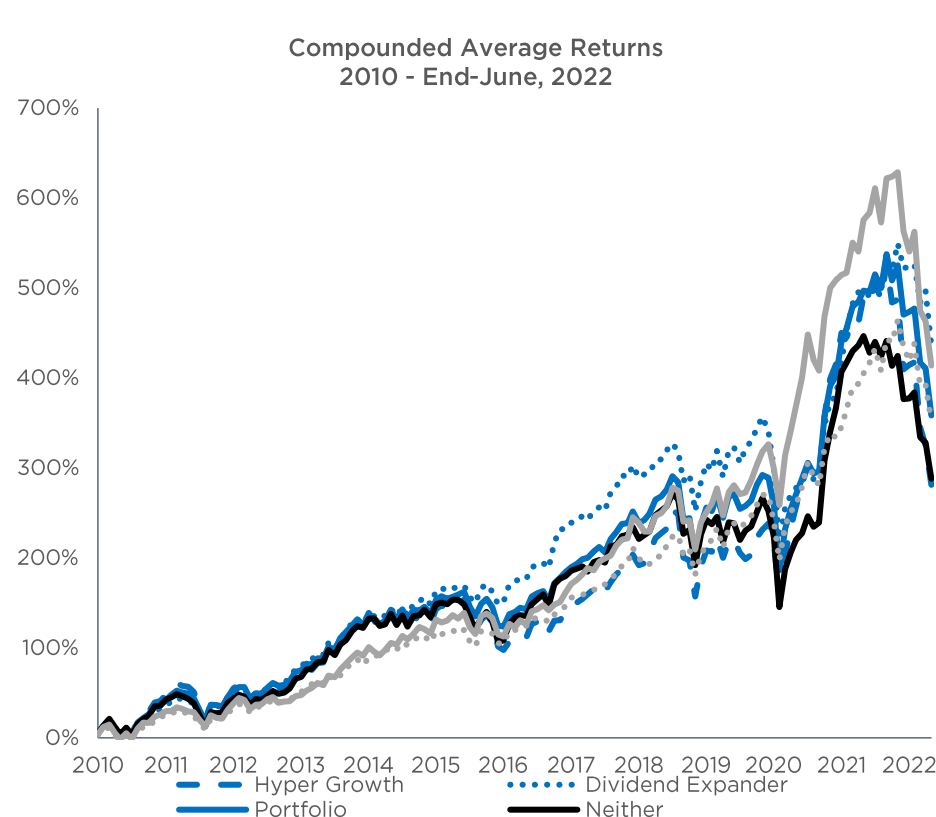
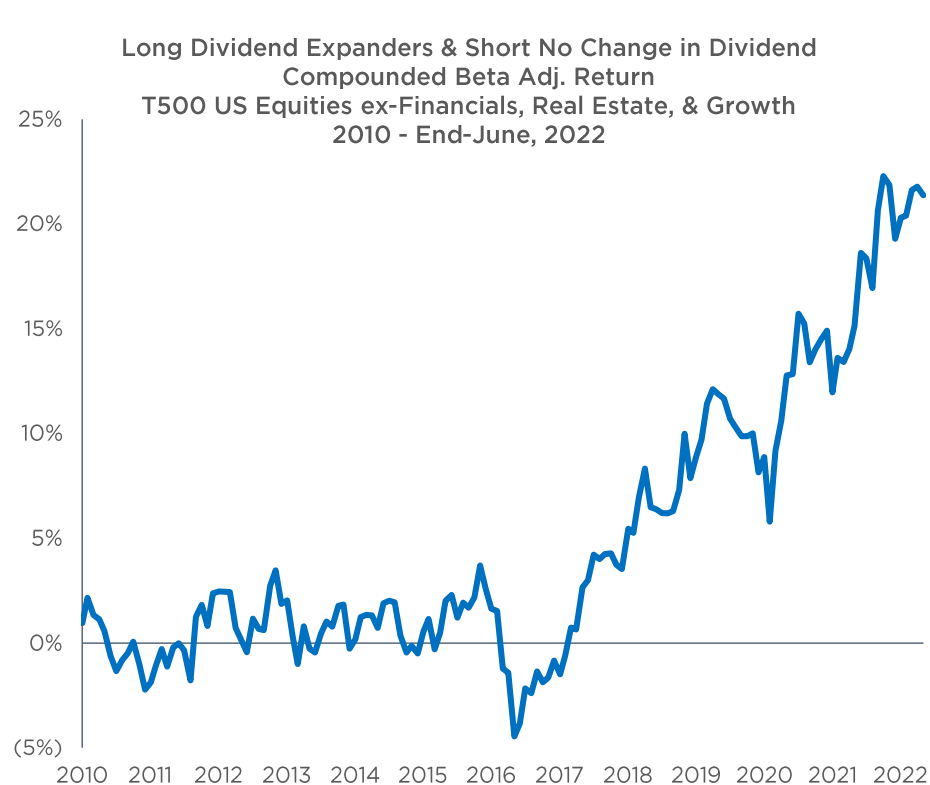
YIELD AND BUYBACK RETURNS – BUYBACKS DON'T SEPARATE

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



LONG DIVIDEND EXPANDERS IS AN UNDERAPPRECIATED STRATEGY

We compared the performance of dividend expanders to those stocks with no change in their dividend. Performance has deviated the last five years, with no change to the dividend materially lagging consistent expansion (left). In fact, dividend expanders have now cumulatively been better than hyper growth, a portfolio of growth and dividend or the QQQs this cycle (right).



YOU MUST EXPAND YOUR DIVIDEND WHILE THE FED'S HIKING

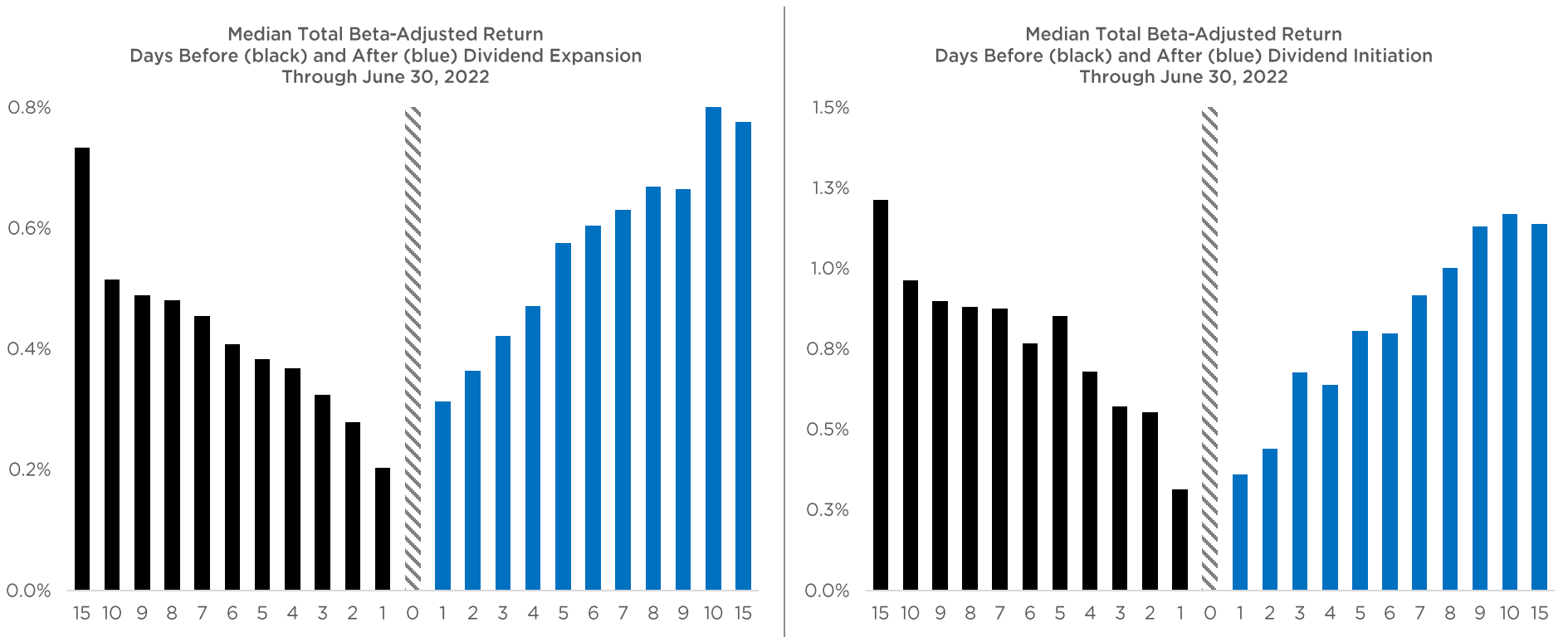
Everyone wants to know which year in the past most closely rhymes today's environment. Investors ask us what happened following the previous set of lift-off and hikes, so we evaluated the various strategies one-month before and 3-months after each Fed hike since the Financial crisis. Growing the dividend through the hiking cycle seems by far the best strategy. Having your yield above your peer-group (level) did not generally help. If you have no dividend now, initiating one is not a bad idea. Cutting, or even leaving the dividend unchanged was generally penalized. As history dictated, dividend-yielding stocks have outperformed YTD as rates have risen.

Beta-Adjusted Returns
Select Signals

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

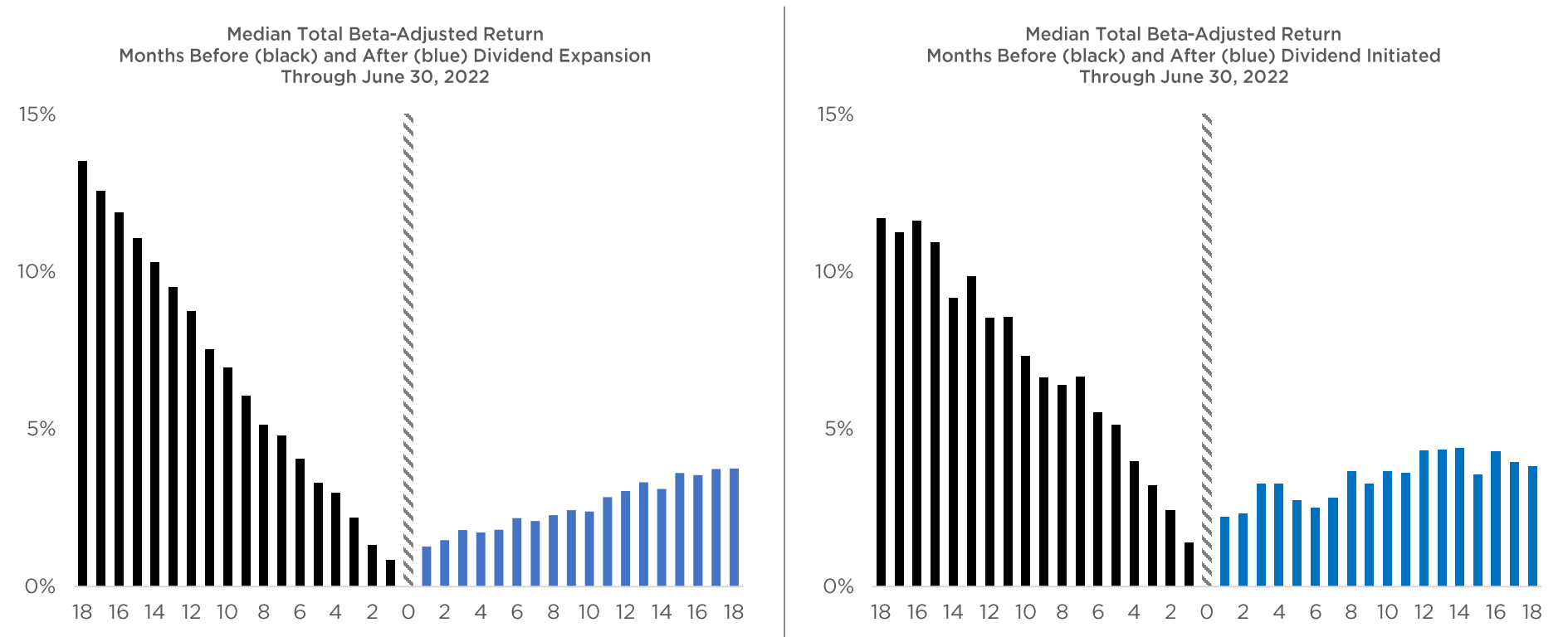
THERE IS A SUSTAINED MARKET REACTION TO DIVIDEND BEHAVIORS

We studied the short-term behavior of companies initiating or expanding their dividends since 1999. Expanders continued to outperform for three weeks after their dividend increase in aggregate (left), even though they also outperformed on average prior to the announcement. This indicates that it is not too late on average to invest following the announcement. Similarly, companies that initiate a dividend, continue to outperform for 15 days following the announcement (right).



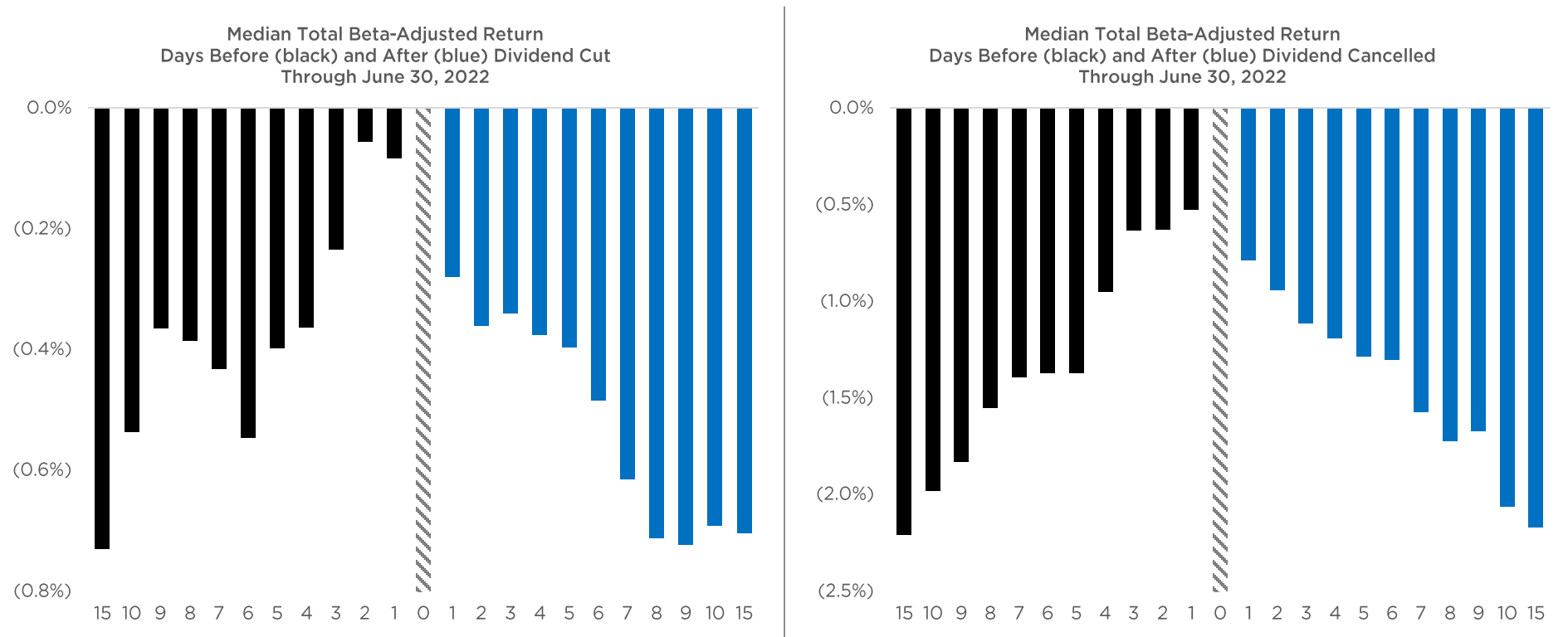
ALPHA PEAKS 12-TO-18 MONTHS LATER FOR THESE STRATEGIES

Over the long-term, outperformance continues for expanders for 18 months on average, even though many strongly outperform the 1.5 years prior to the expansion. Those that initiate a dividend also perform well beforehand, but alpha peaks earlier than for expanders.



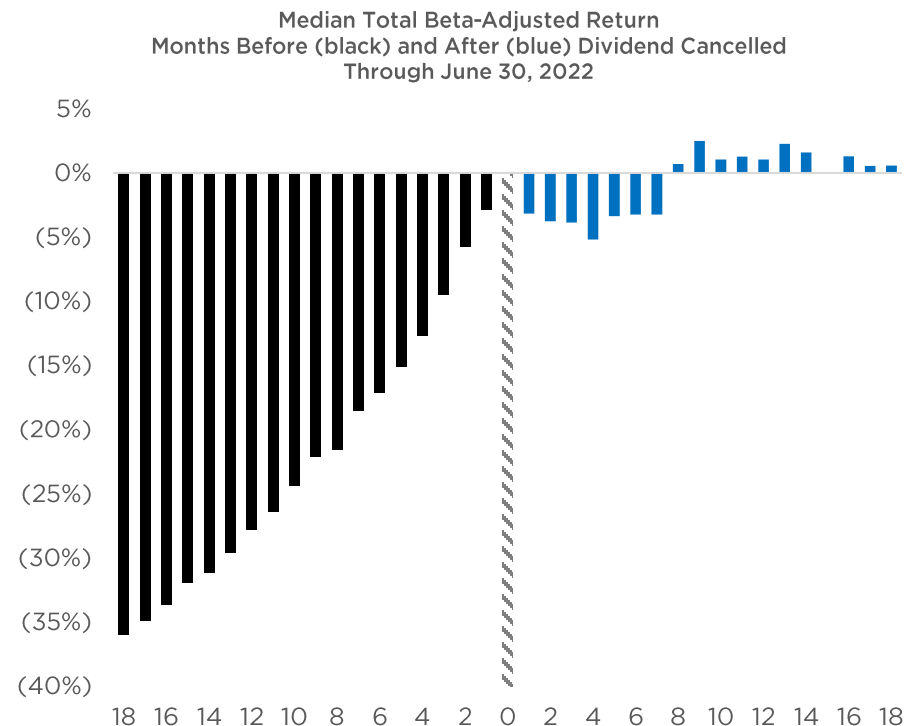
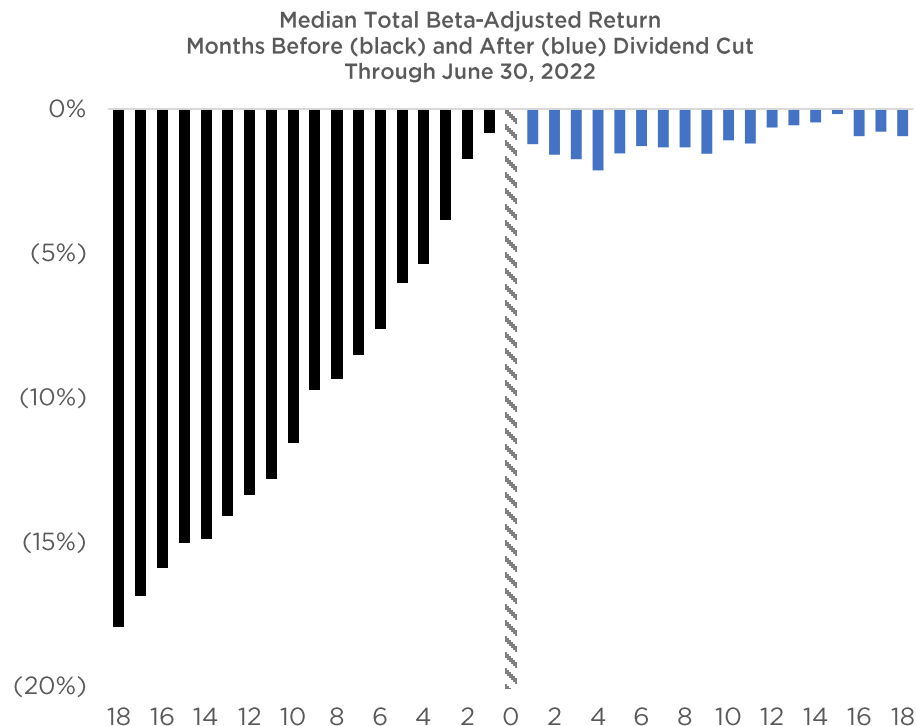
DIVIDEND CUTTING / CANCELLING DOES NOT REVERSE IMMEDIATELY

Similarly, it is not too late to sell cutters (left) or cancellers (right). Stocks that announce a dividend cut lag prior to their announcement, but trough nine days after the announcement. Dividend cancellers lag by 200bps on a beta-adjusted basis for the ten trading days prior to announcing a cut. They then lag another 150bps on a beta-adjusted basis beyond the initial one-day reaction over the next 15 days on average.



BUT MAY NOT BE A LONG-TERM SHORT STRATEGY

Shorting cutters (left) and cancellers (right) over a longer-term horizon, is not as strong of a strategy as buying is for expanders / initiators. Dividend cutters and cancellers STRONGLY underperform prior to their announcements and drag negative alpha for about five months more for both on average. Cancellers (who survive) start to beat the market by nine months after their announcement on average as ostensibly they have adjusted their business model to begin to have better prospects.



CHAPTER 4: CAPITAL SPENDING / R&D

We investigated trends in the levels and changes in capital and R&D intensity and the efficacy of these signals in terms of predictive value for stock performance.

Capital spending is particularly relevant today, as one of the biggest investment controversies is when and where will inflation abate. Procurement officers and CFOs have been struggling to gauge when and how to add capacity and how much backlog to order from key suppliers. Our overall conclusion is that capital spending additions should be made conservatively, as we think the backlogs on many suppliers' balance sheets will ultimately be pushed out or cancelled. Current corporate expectations are for 10% earnings growth in 2022, but if production exceeds consumption margin deleveraging could be meaningful in sectors including machinery and semiconductors.

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

The implications of capital and R&D spending widely vary. Investors and corporates should find our work on trends and factor efficacy useful. Management teams may not be fully aware of how to deploy capital and how the market rewards / penalizes those decisions. Future gross margins are important investment metric and can be impaired when depreciation balloons following capital spending.

CAPITAL SPENDING / R&D CONCLUSIONS

Dynamics and implications vary widely by industry.

Energy is different: Over the last 20 years less capital-intensive energy companies clearly outperform their peers, by 6% per annum on average. However, **the most capital-intensive energy stocks have outperformed the least capital intensive in 15 of the last 18 quarters.** Given the supply-demand imbalances in oil, we expect the more capital-intensive and oil-sensitive stocks to continue to perform well. We expect high returns on investment even at oil prices well below today's levels.

Pharma / biotech: Avoiding the highly capital-intensive stocks has been prudent the last 20 years, as this quintile alone has lagged by nearly 10% per annum. Reducing the capital intensity by finding outsourced manufacturing has generally been a good idea, as this group performs strongly against peers. Lower levels of R&D-intensity clearly are better than higher, outperforming by nearly 20% per year. **There is a huge difference in R&D intensity within pharma / biotech, with the median company spending more in R&D than they have in revenue** vs. the median of around 14% R&D-to-sales for companies with more than \$250m in annual revenue. **Few companies lower their R&D spend in absolute dollars, as everyone is eternally optimistic safety and efficacy are coming.**

Software & services: R&D spending is obviously crucial for innovation, share gain, and the potential to be acquired for your engineering talent and installed base of customers. However, software and services companies with very high R&D-intensity should be avoided and those that reduce their R&D-intensity outperform those where R&D-intensity increases.

Bottom-line: Software companies with rising R&D-to-sales turn out to either have management teams that were excessively optimistic about the future revenue potential from their increased engineering spend, or have declining sales, neither of which are rewarded with better-than-peer stock returns.

CAPITAL SPENDING / R&D CONCLUSIONS

Semiconductors: Avoiding the most capital-intensive business models in semiconductors has been prudent, even if capital spending-to-sales level really have not been a great discriminator of returns outside of the leading-edge companies. Semis have several different business models, with fabless, old technology, and leading-edge manufacturers making a range of capital spending-to-sales from low single digits for AVGO to mid-20s for INTC and MU – nonetheless, spending has been a huge destroyer of shareholder value over the long-term for these businesses.

Hardware: Technology hardware businesses with low capital intensity do better than those with high intensity and those that improve generally do better than those that increase spending. Those picking technology hardware companies would be wise to pay attention to these trends, as they impact free cash flow in a generally value-sensitive group of stocks.

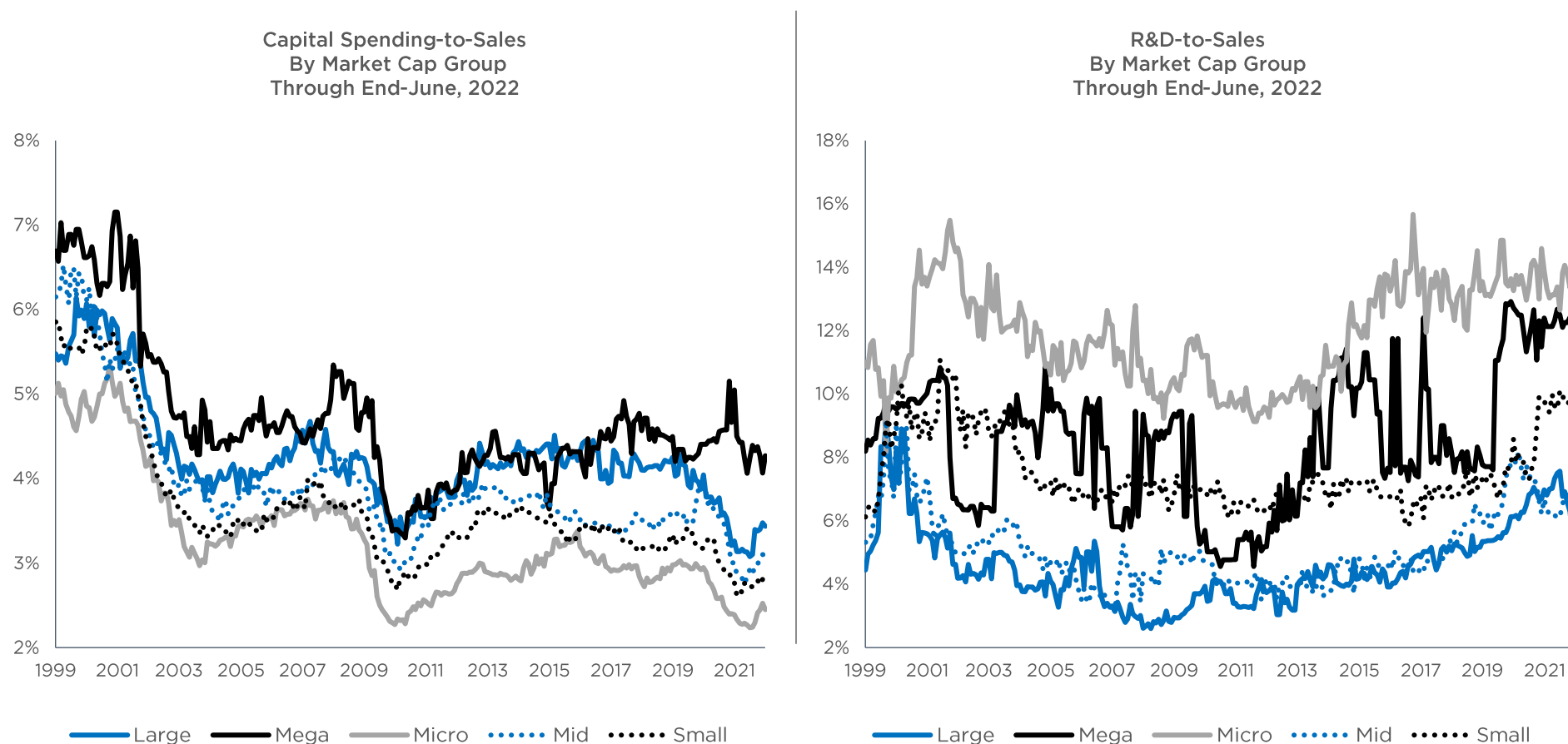
Durables are the opposite of media: For durables there are widely disparate business models (homebuilders, appliances, select apparel, etc.), but nonetheless relative-to-industry returns discriminate nicely based on capital intensity. On the contrary, media businesses require capital investment today to generate future ARPU and as such those businesses that **can access capital and spend it typically outperform those who cannot, by nearly 16% per year over the last 20 years.**

Conclusions: We put together a list of long / short ideas based on R&D and capital spending level and change, predicated on historical factor efficacy. Please reach out to us to provide current stocks.

Biggest destroyers of value: One important metric of whether companies are creating / destroying value with their investment spend is to sum their cumulative market cap. appreciations and dividends and compare them to cumulative R&D and capital spending over a sustained period. **We evaluated this since 1999 and found that GE, INTC, IBM, F, and HPQ destroyed the most value.** Unsurprisingly, APPL, MSFT, and AMZN were among the biggest market value creators.

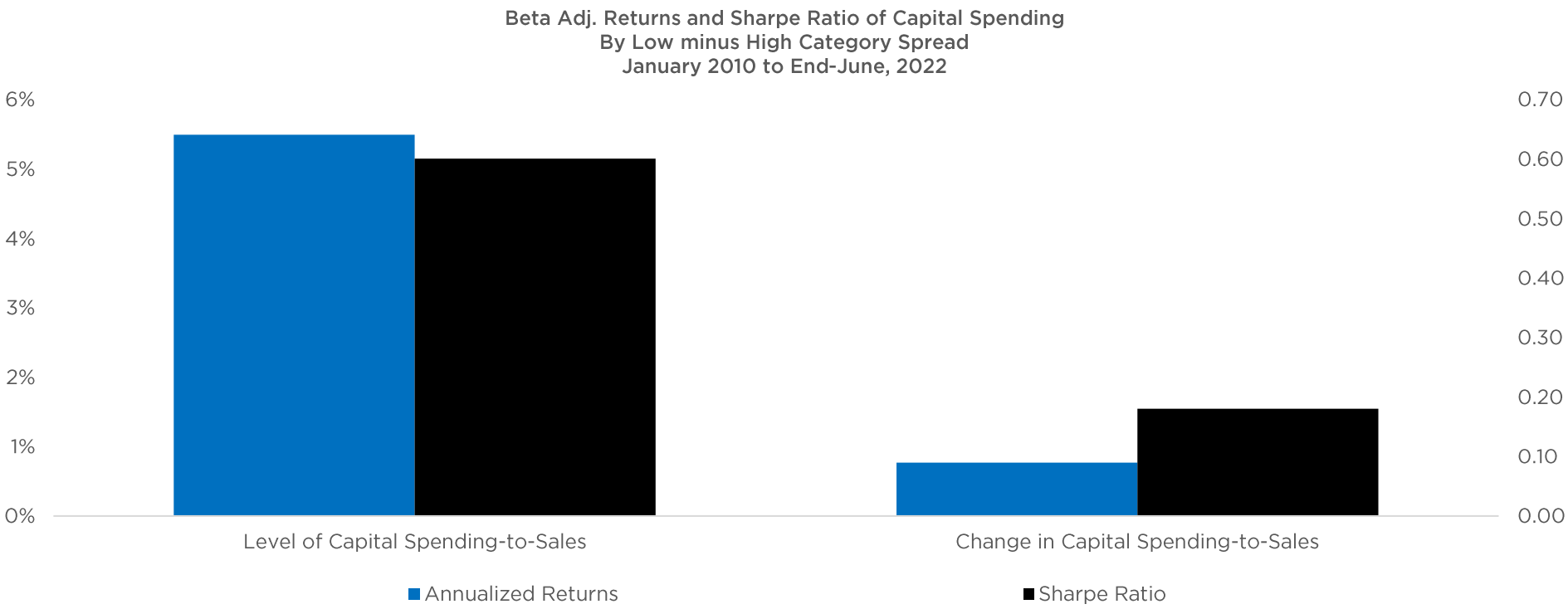
OVERALL CAPITAL-INTENSITY IS DOWN AND R&D-INTENSITY IS UP

As the US has become a more service-oriented stock market over the past twenty years, capital intensity has generally waned. Mega caps are an exception, where capital spending-to-sales ratios have hovered around 4% since the financial crisis, whereas mid, small and micro-cap companies essentially are near all-time lows on investment (left). As more healthcare and software companies have entered the US stock market universe, R&D intensity has grown, above 10% for the tech heavy mega-caps (right).



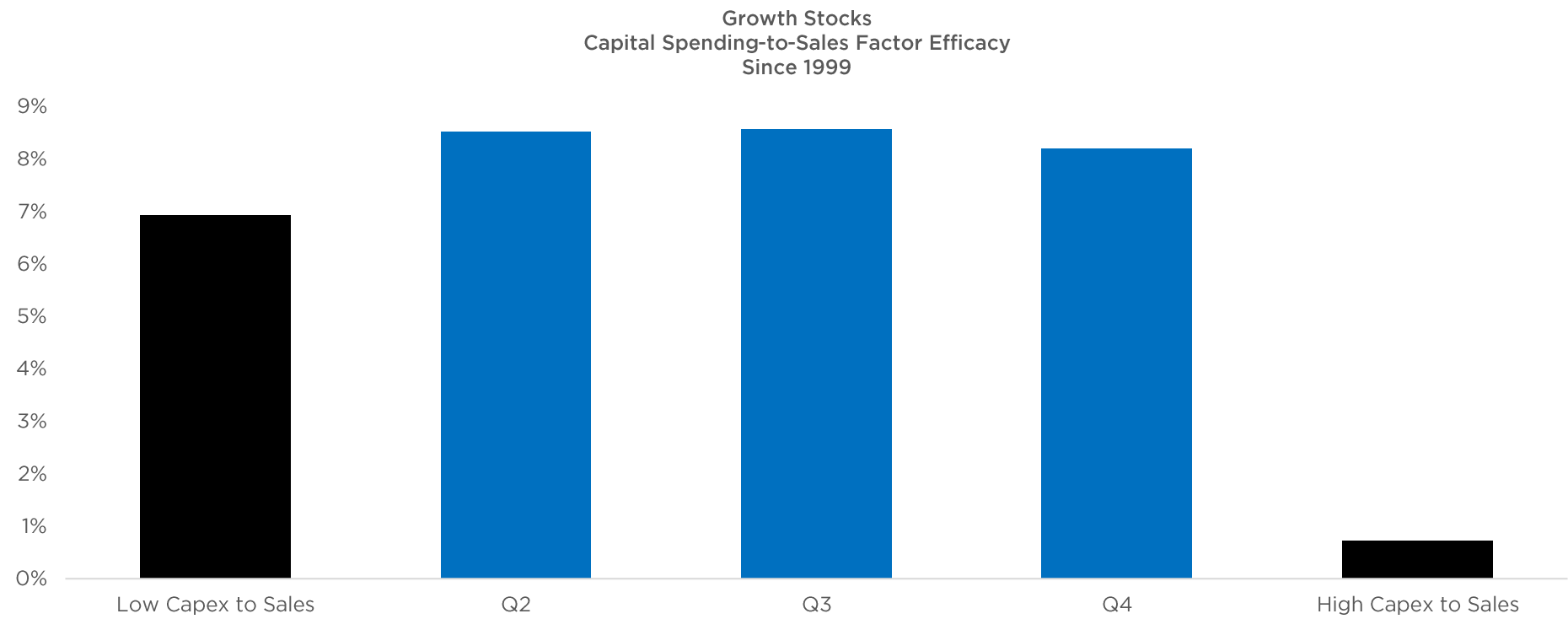
CAPITAL SPENDING IS NOT A POSITIVE

Companies with low and declining capital spending-to-sales generally outperform those with high and increasing capital intensity.



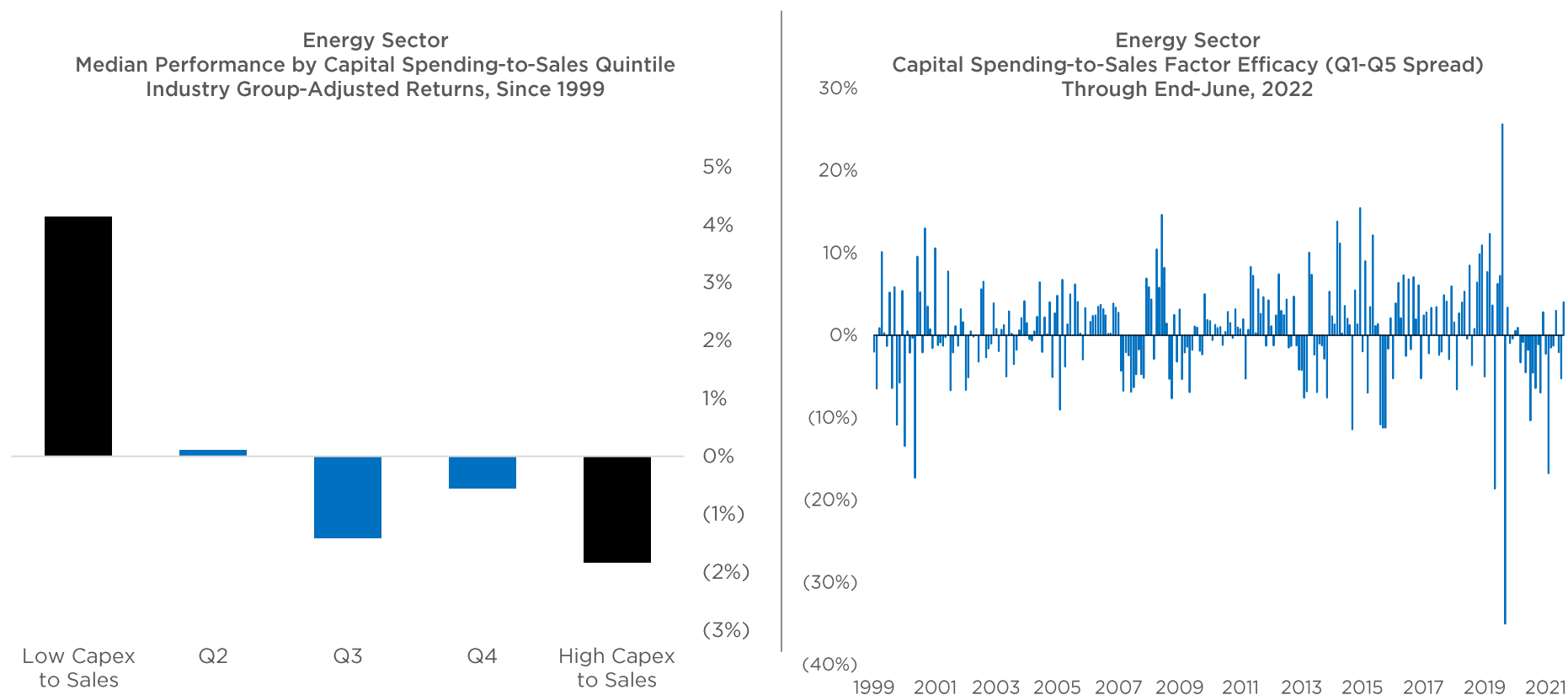
CAPITAL-INTENSIVE GROWTH STOCKS LAG

We analyzed whether companies with high capital spending-to-sales outperform those with low capital spending-to-sales. We broke this down by size, substance, and style, and determined that capital intensity was not a good predictor of subsequent stock return. Given the nature of growth stocks, shown here, there was some evidence that the highest quintile of capital spending-to-sales companies lagged, but overall our conclusion is that level of capital spending is not a great predictor of subsequent returns.



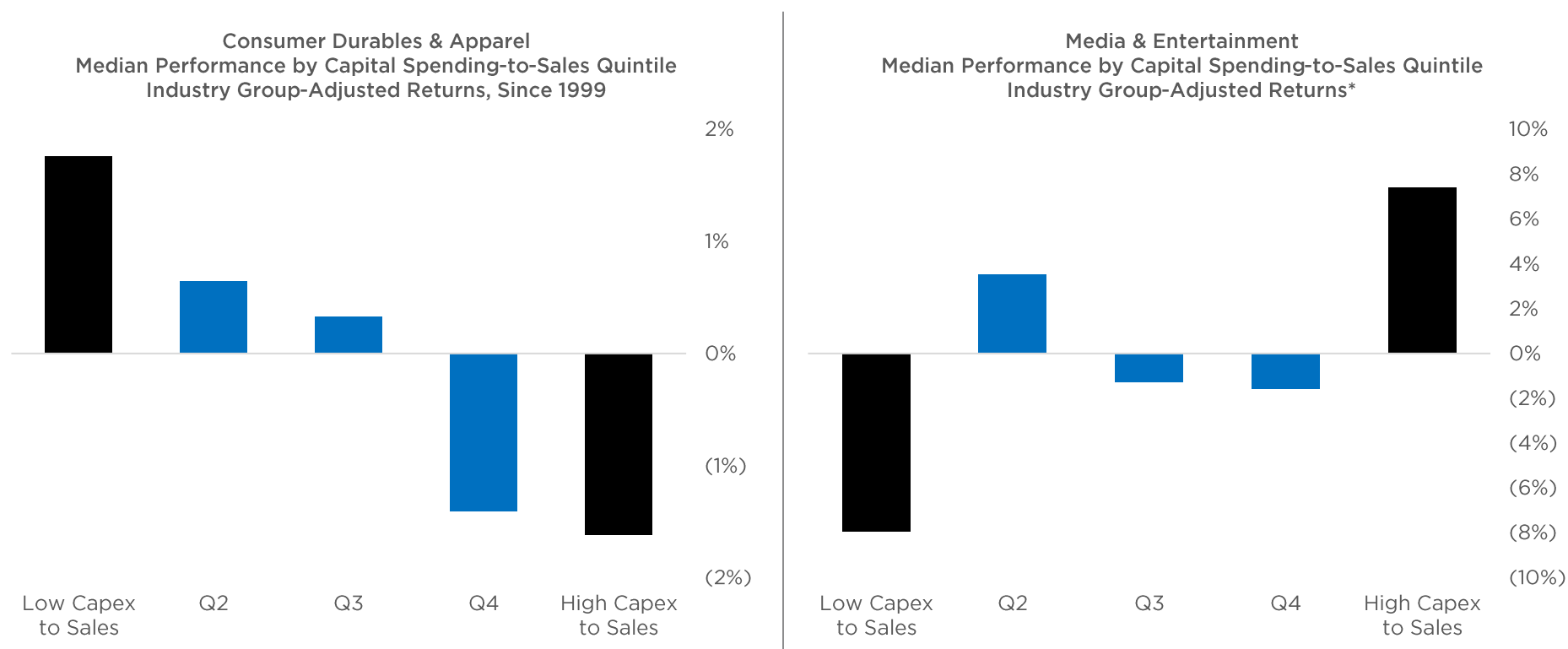
HISTORICALLY, CAPITAL INTENSITY WAS BAD IN ENERGY, BUT NOT NOW

Within the energy sector, over the last 20 years (left) less capital-intensive companies outperformed their peers, by 6% per annum on average. In fact, many investors mocked the “cowboy” like approach energy CEOs had towards spending. However, the most capital-intensive energy stocks have outperformed the least capital intensive in 15 of the last 21 quarters (right). Given the supply-demand imbalances in oil, we expect increased capital intensity and oil-sensitive stocks to continue to perform well for the foreseeable future.



FOR DURABLES LOW CAPX IS GOOD BUT FOR MEDIA SPENDING IS KEY

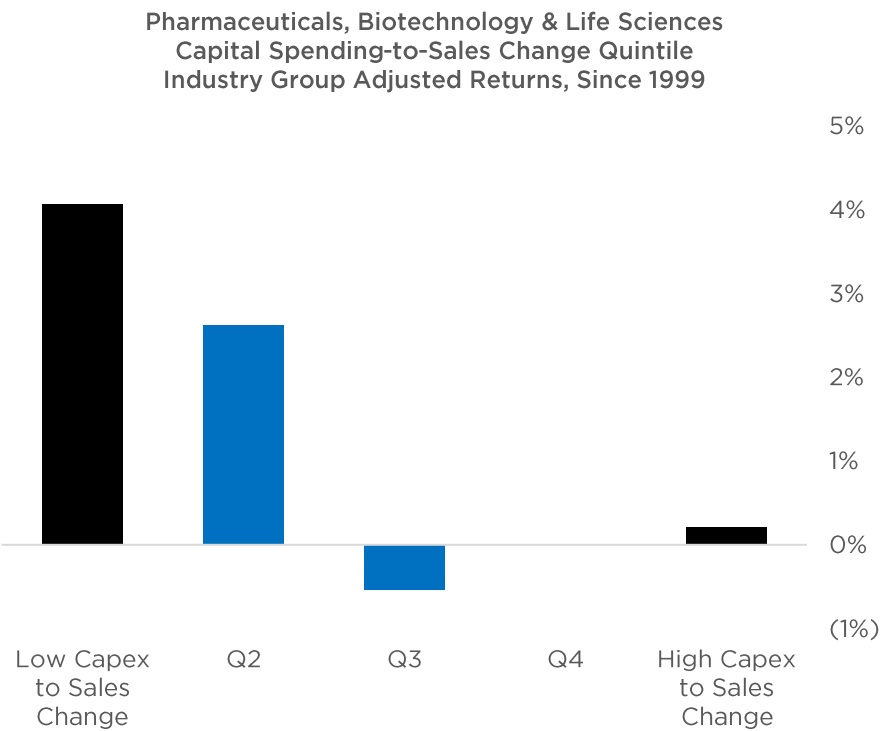
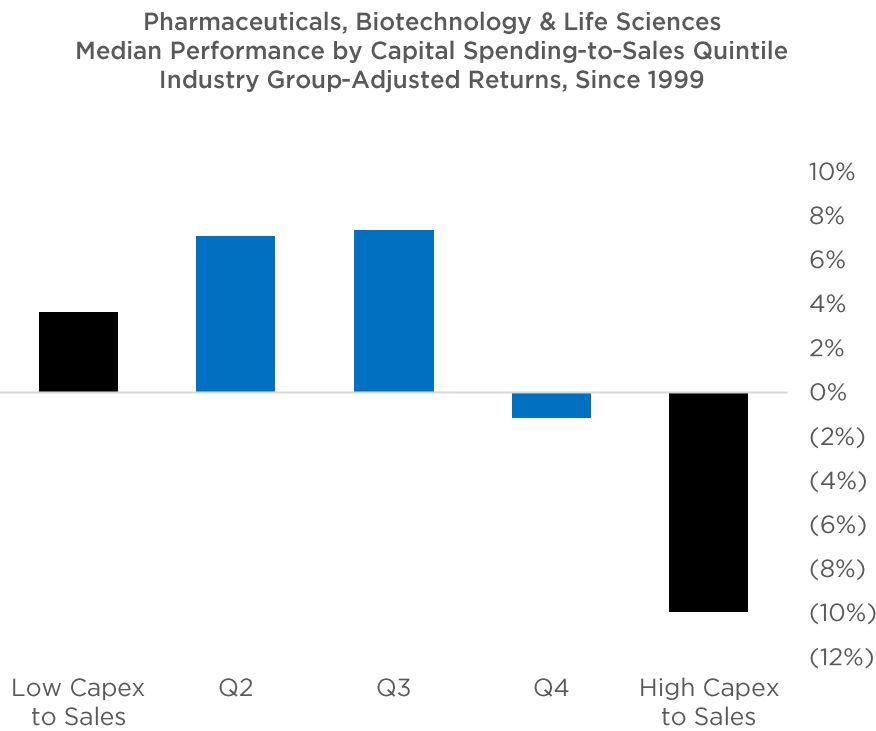
Durables are an unusual industry, as it contains a disparate group of stocks including homebuilders, air conditioners, appliances, and select apparel. Nonetheless, relative-to-industry returns discriminate nicely based on capital intensity (left). On the flip side, media and telecom businesses (right) require capital investment today to generate ARPU (average revenue per user) in the future and as such those businesses that can access capital typically strongly outperform those who cannot, to the tune of nearly 16% per annum.



*Returns since creation of Media & Entertainment GICS on 09/28/2018

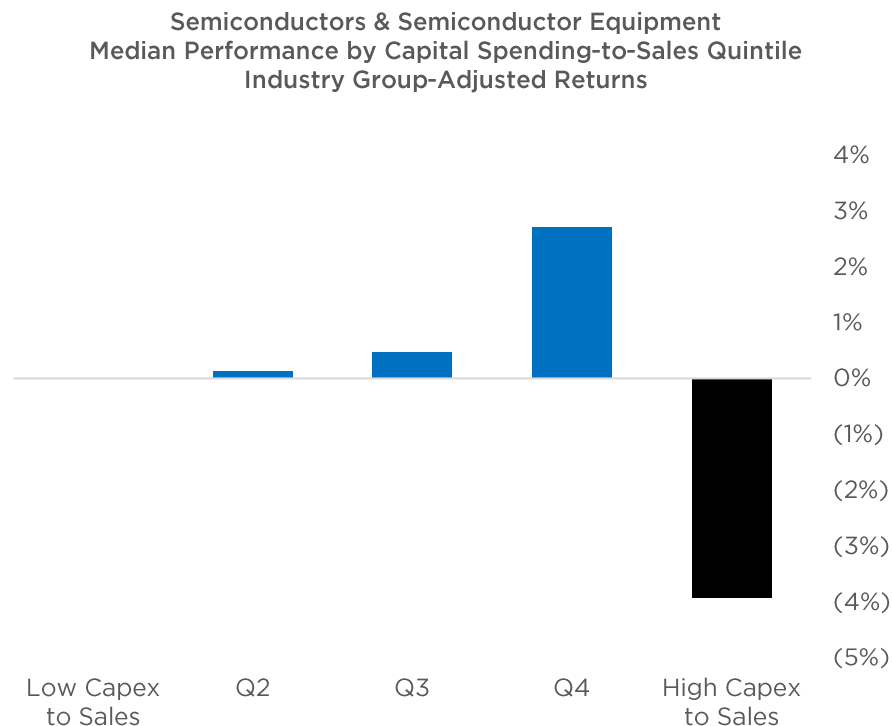
LOW AND LOWER GOOD IN PHARMA / BIOTECH

Avoiding the highest capital intensity names has been prudent in this group for the last 20 years, as this quintile alone has lagged by nearly 10% per annum (left). Reducing the capital intensity has been a good idea, as this top quintile performs strongly against peers (right).



HIGH CAPITAL-INTENSITY HAS BEEN BAD FOR SEMICONDUCTORS

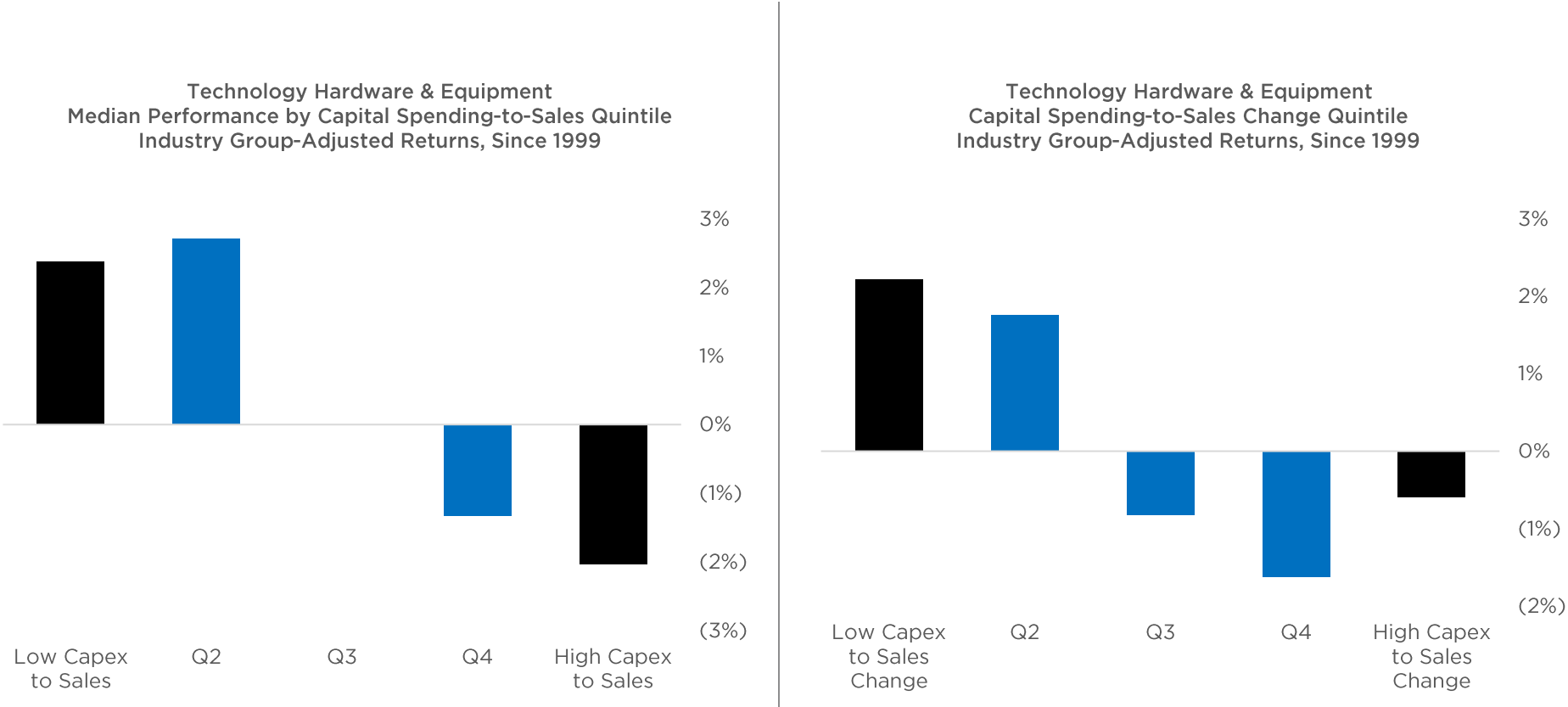
Avoiding the most capital-intensive business models in semiconductors has been prudent, even if capital spending-to-sales level has not been a great discriminator of returns outside of the leading-edge companies (left). Semis have tons of different business models (right), with fabless, old tech., and leading-edge manufacturers making a range of capital spending-to-sales from low single digits for AVGO to mid-20s for INTC and low 30s for MU (right).



Capital Spending-to-Sales Top 15 Semis & Semi Equip Stocks by Market Cap End-June 2022			
Ticker	Company	Market Cap (\$B)	Capex as % of Sales
NVDA	NVIDIA Corporation	379.58	3.5%
AVGO	Broadcom Inc.	196.18	1.3%
INTC	Intel Corporation	152.96	26.7%
QCOM	QUALCOMM Incorporated	143.07	5.1%
TXN	Texas Instruments Incorporated	141.69	13.7%
AMD	Advanced Micro Devices, Inc.	123.92	1.6%
AMAT	Applied Materials, Inc.	79.15	2.8%
ADI	Analog Devices, Inc.	75.94	4.4%
MU	Micron Technology, Inc.	61.73	32.6%
LRCX	Lam Research Corporation	59.11	3.1%
KLAC	KLA Corporation	47.62	3.3%
NXPI	NXP Semiconductors N.V.	38.87	8.0%
MRVL	Marvell Technology, Inc.	37.00	3.6%
MCHP	Microchip Tech Incorporated	32.21	5.4%
ENPH	Enphase Energy, Inc.	26.36	3.6%

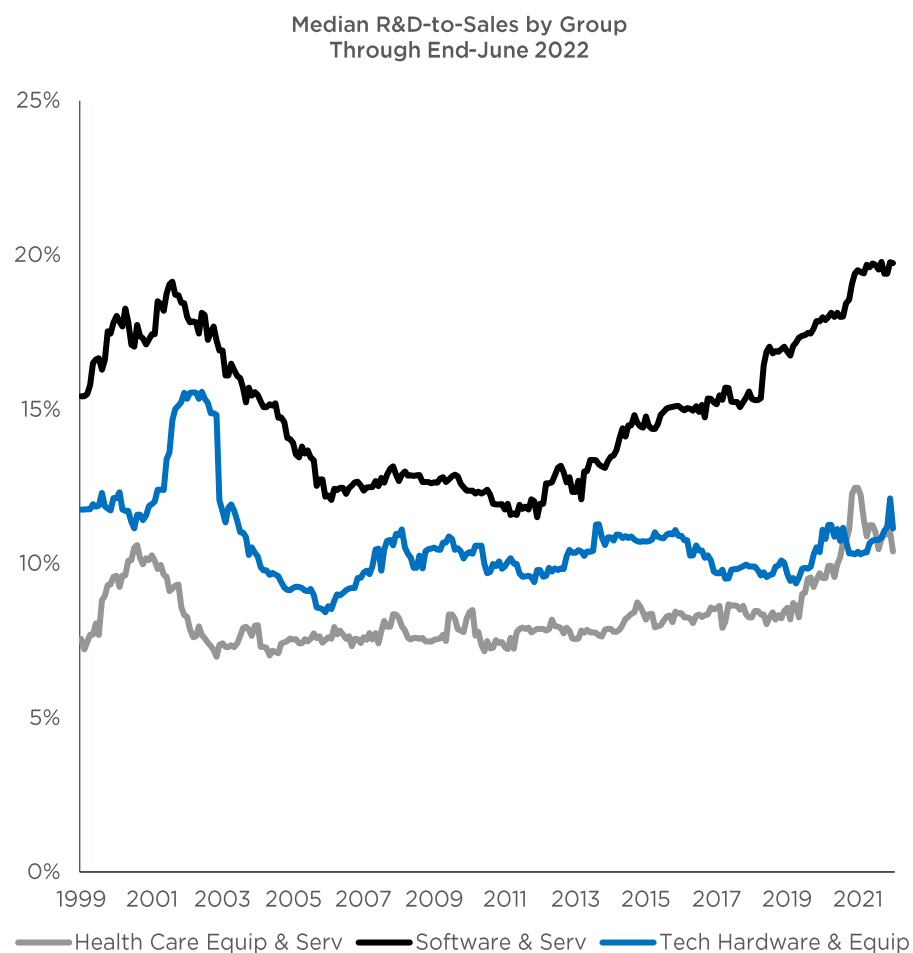
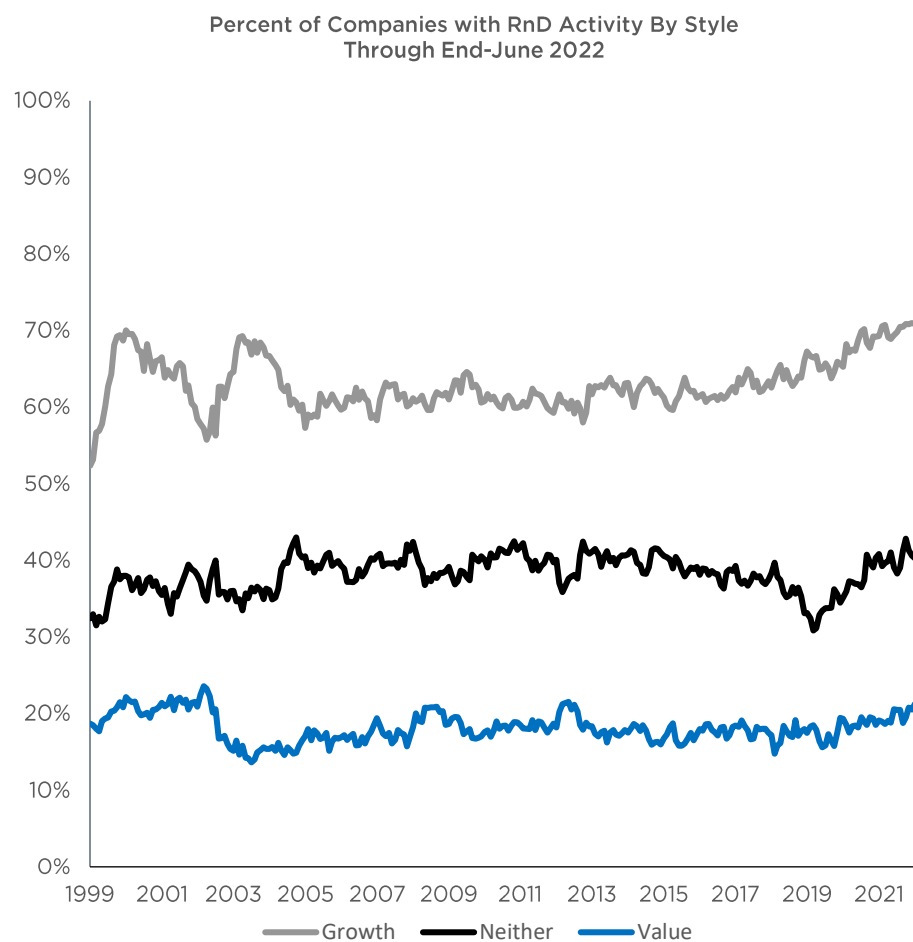
LOW AND IMPROVING CAPITAL INTENSITY A WIN FOR HARDWARE

Technology hardware businesses with low capital intensity do better than those with high intensity (left) and those that improve generally do better than those that spend (right). Those picking technology hardware companies would be smart to pay attention to these trends, as they impact free cash flow in a generally value-sensitive group of stocks.



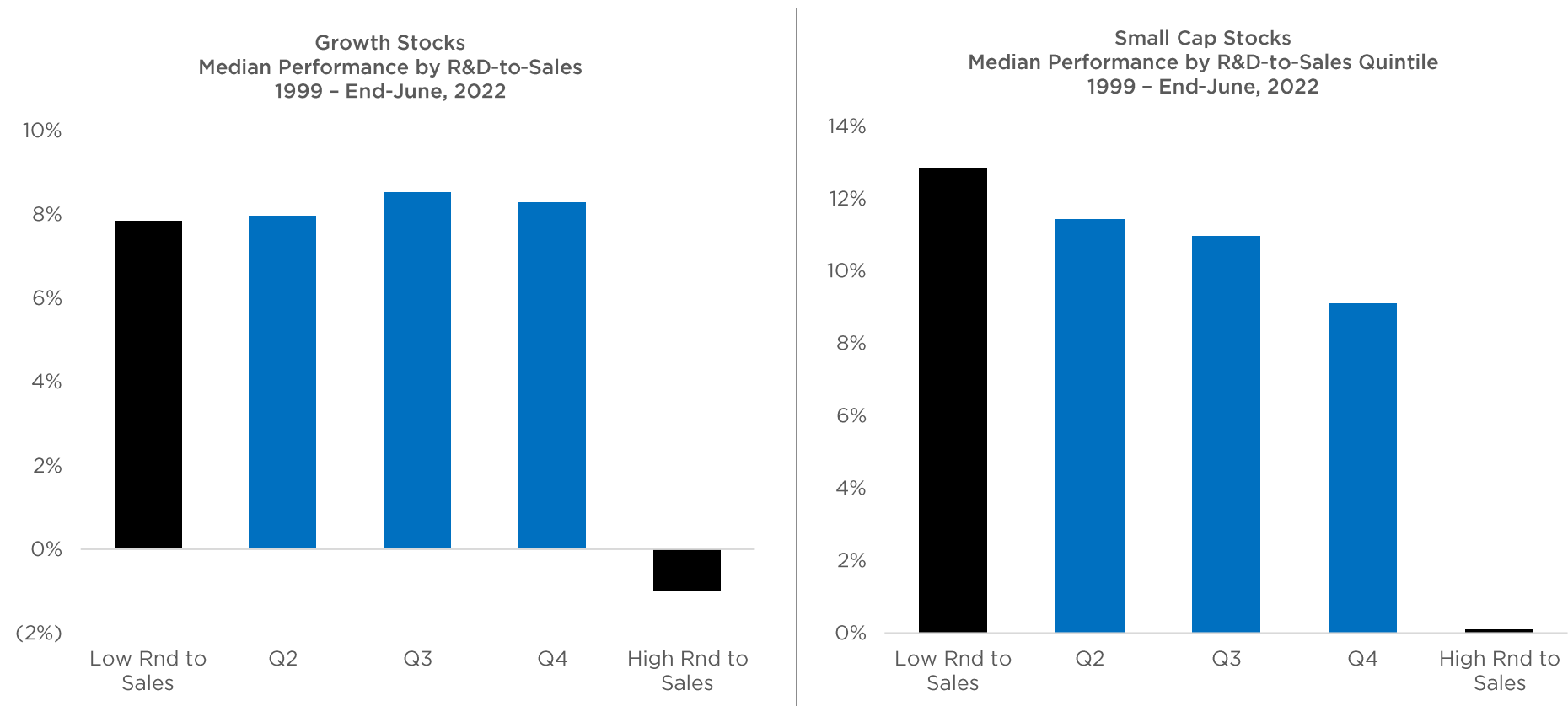
ONLY 20% OF VALUE STOCKS EVEN DO R&D

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



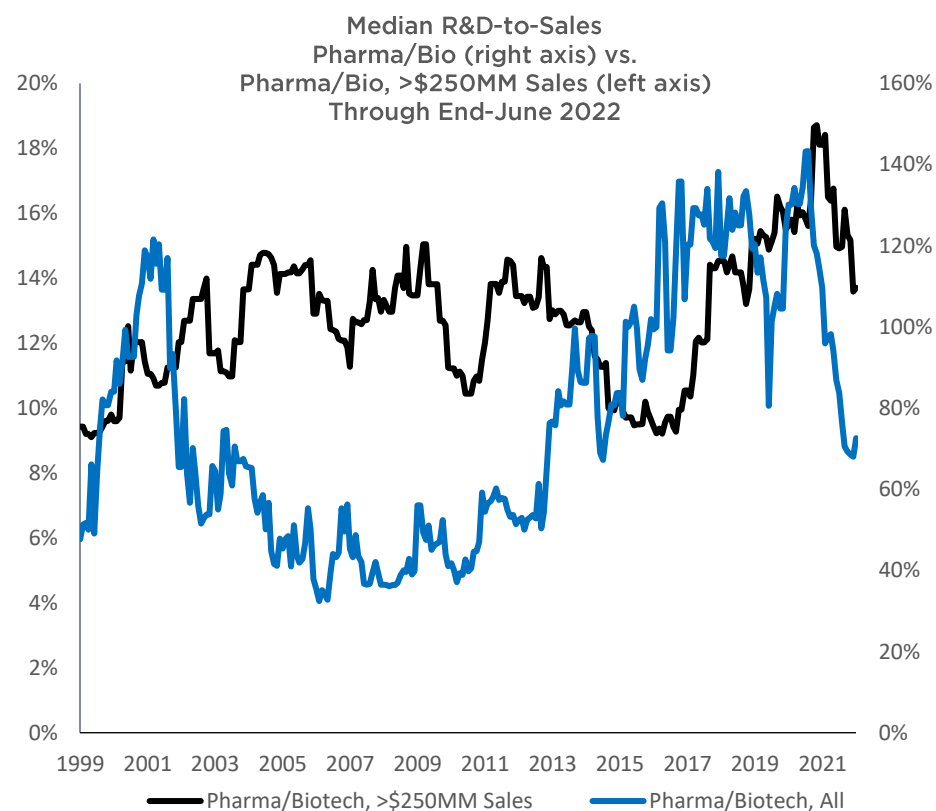
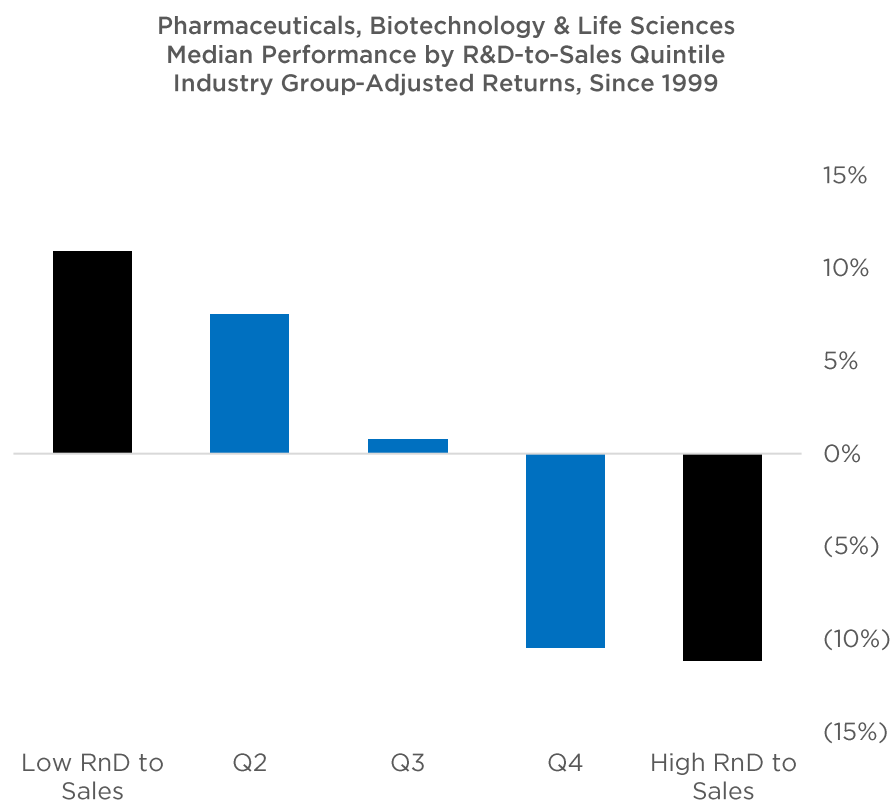
AVOIDING HIGH SPENDING SMALL CAPS IS PRUDENT

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



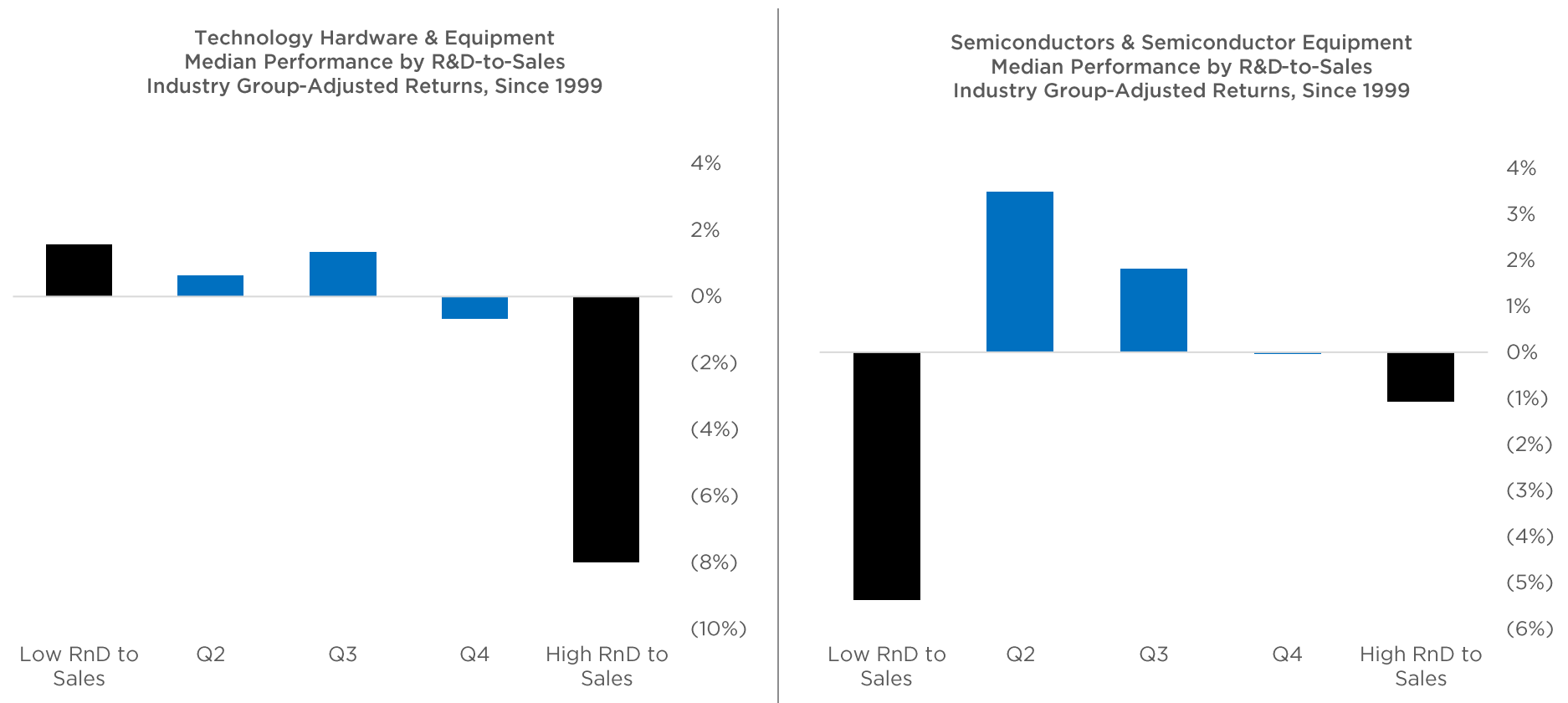
THE MEDIAN BIOTECH HAS HAD MORE R&D SPEND THAN REVENUE!

Among pharma / biotech, lower levels of R&D-intensity clearly are better than higher, outperforming by nearly 20% per year (left). There is a significant difference in R&D intensity within pharma / biotech, with the median company spending more in R&D than they have in revenue (black line on right) vs. the median of around 14% R&D-to-sales for companies with more than \$250m in annual revenue (blue line on right). The drop off in R&D-to-sales in recent months has been precipitous.



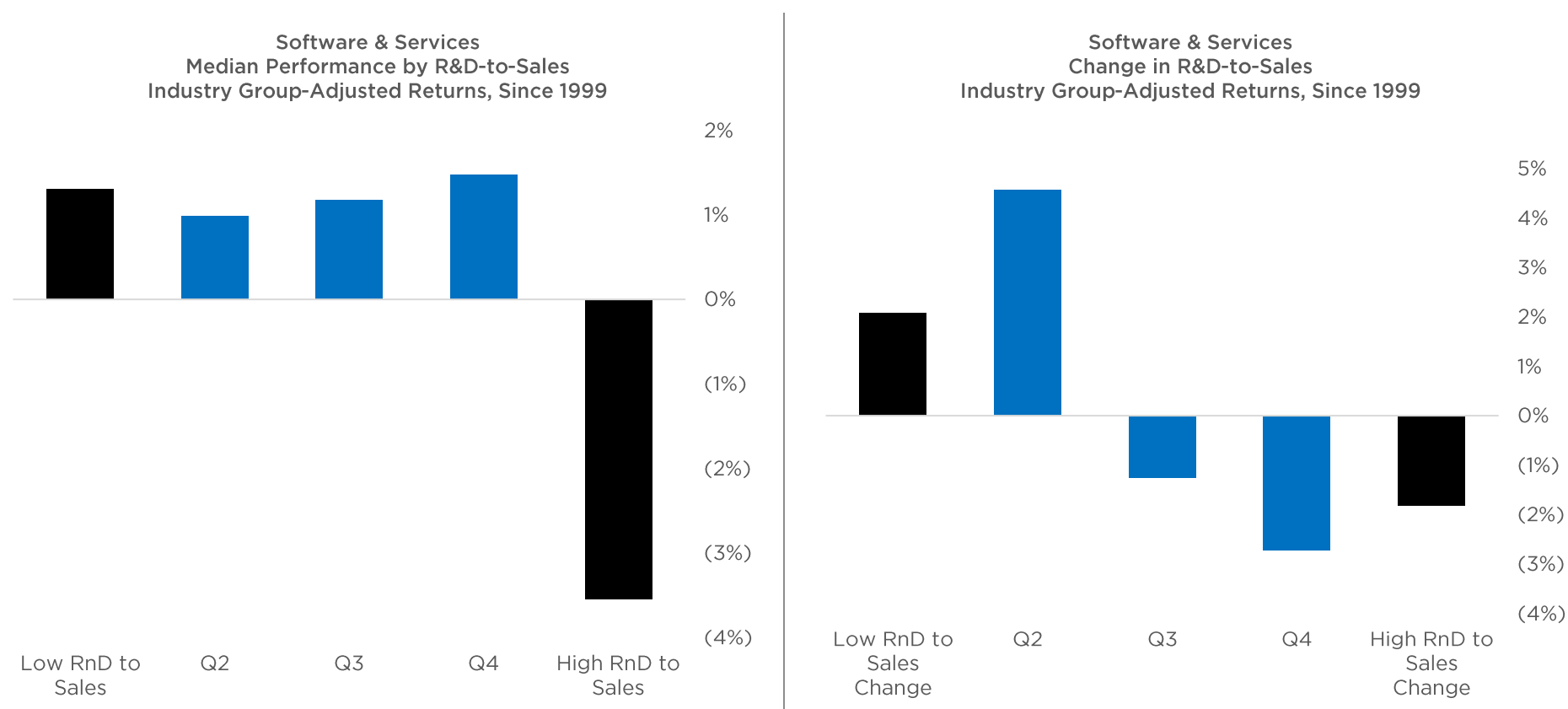
WITHIN TECHNOLOGY, R&D INTENSITY IS PENALIZED AND REWARDED

Technology hardware companies in the highest quintile of R&D-to-sales underperform peers by 8% per year, otherwise R&D intensity is not a predictive metric for subsequent return (left). Semis are the opposite – the lowest R&D intensity quintile of stocks lags, but otherwise the signal is not particularly predictive (right).



SOFTWARE COMPANIES NEED TO INVEST, BUT NOT EXCESSIVELY

For software & services, R&D spending is obviously crucial for innovation, share gain, and the potential to be acquired for your engineering talent and installed base of customers. However, those with very high R&D intensity should be avoided, even if investment doesn't differentiate at all among peers if it isn't extremely high (left). The software companies that lower their R&D intensity outperform those where R&D intensity increases (right).



CHAPTER 5: LEVERAGE

With materially higher interest rates over the last few quarters, we think it is timely to analyze the level and changes to corporate debt, both total and net, and the impact corporate decision-making about leverage has on equity performance.

In an academic setting, many are taught the stability and sustainability of a business model translates to different optimal capital structures for some businesses relative to others. However, for much of the last 30 years, rates fell, and refinancing was somewhat easy. In most cases, companies refinanced at lower rates than they originally borrowed at - and faced less - not more - of a financial burden for their leverage.

Rising rates and the potential for earnings declines will mean leverage - for both fundamental and quantitative analysts - could matter more now than it has for much of the past 20 years. As such we looked at debt “the Trivariate way” by analyzing the predictive value of the top and bottom quintile, and spreads, of level and change of total and net debt by substance, style size, and sector to look for historical efficacy.

The lack of penalty for heavily indebted industries in the last 20 years could be misleading, as one could conclude that the capital structure of companies just isn’t relevant to subsequent return. Our judgment is that while that be might factually true for the last twenty years, it is neither logical nor likely to persist as businesses are forced to refinance at higher rates and having a growing (not perpetually declining) interest expense burden.

LEVERAGE CONCLUSIONS

2022 has been anomalous: The most levered companies have beaten the least levered by 50% YTD, and for seven consecutive months – the biggest run in over twenty years. Obviously, growth stocks with limited debt have lagged, and typically indebted businesses like energy and utilities have performed well, explaining the recent perversity in factor efficacy.

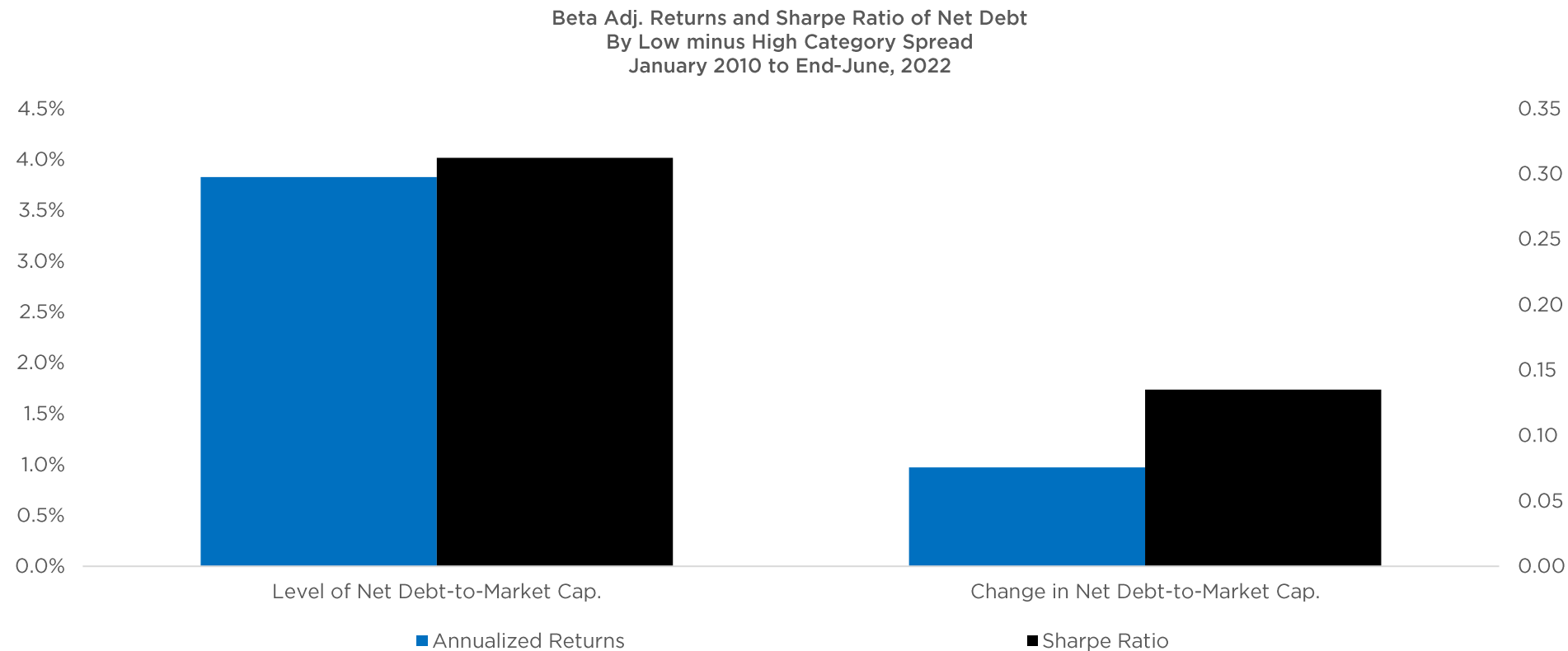
More than growth vs. energy: However, it has been more than just the growth and sector performance. Why? Even within sector and group, debt-related signals have broadly failed to help investors pick winners from losers over the last two decades. For instance, “junk” stocks with high and rising debt have not really lagged “junk” stocks with relatively lower and declining debt. We see an inflection in the importance of the balance sheet for equity valuations. Debt-related metrics will matter for stock selection and management teams will be evaluated for decisions about their leverage over the coming decade.

Recent decisions have mattered: Stocks that have issued debt have notably underperformed those that have retired debt, lagging by an average of 8.5% year-to-date.

At-risk stocks – potential short ideas: Stocks with a junk credit rating, that have relatively high interest expense-to-net income and have an imminent refinancing (in next 12 months) event seem particularly vulnerable. Many have poor recent price momentum, but we view that as a reason to be short, not long from here. Please contact us for names that are at risk.

LOW AND DECLINING DEBT IS BETTER THAN HIGH AND RISING

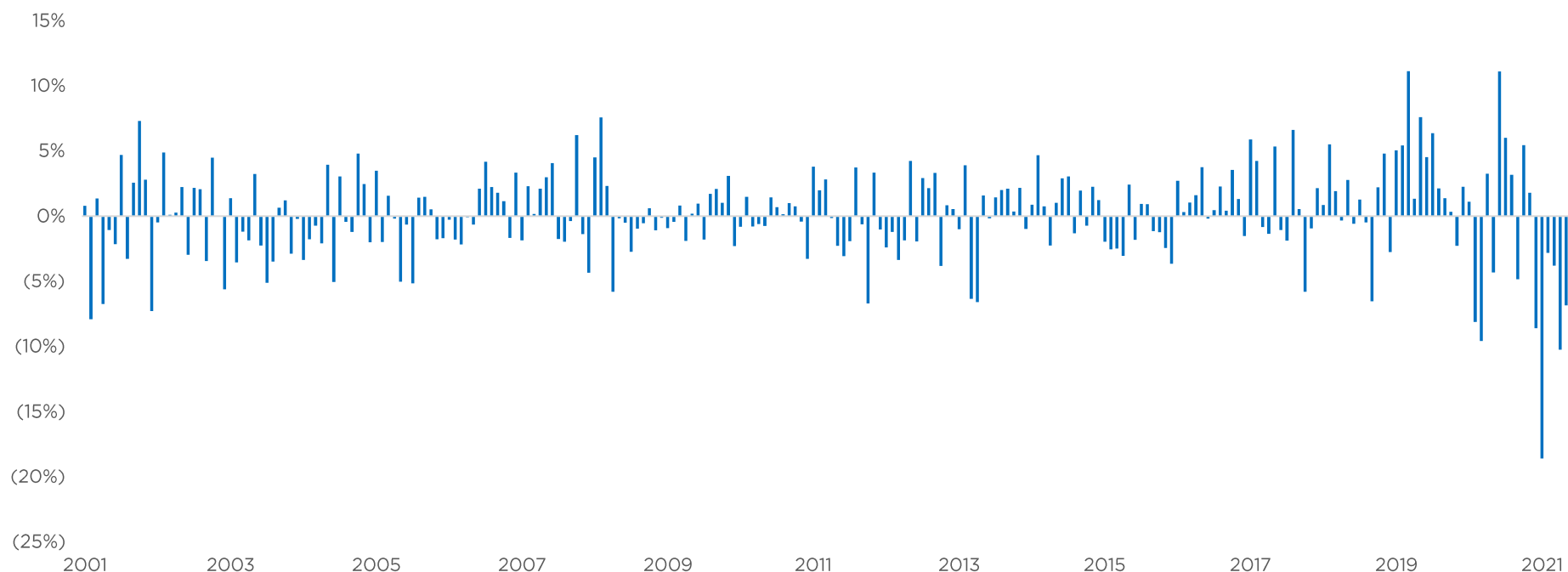
Companies in the top quintile of net debt-to-market capitalization (low) outperform those with high debt-to-cap by 400bps per year (left). Lowering debt is better than increasing it, though of a lower magnitude than level (right).



TOTAL DEBT HAS RECENTLY FAILED TREMENDOUSLY AS A SIGNAL

We analyzed the monthly performance of the least levered quintile (total debt-to-market capitalization) relative to the most levered quintile over the last twenty years. All you had to do this year to be up 50% is to long levered companies and short companies with no leverage! This is obviously a function of the growthiest businesses (which typically have little or no debt) performing poorly and typically levered businesses like energy, metals, and utilities performing well.

Total Debt to Market Capitalization Spread Portfolio
Monthly Performance
January 2002 to End-June, 2022



TOTAL AND NET DEBT TO MARKET CAP SIGNAL EFFICACY

We assessed the volatility-adjusted performance of the top quintile (least levered), middle 60%, and bottom quintile (most levered) of total debt (left side of exhibit) and net debt (right side) by sector, substance, and style. We see little different in performance across quintile within most cohorts, suggesting using level and or change in debt to pick stocks has not been incredibly efficacious this past cycle. Level of debt, but not change matters for value stocks.

Sharpe Ratio of Signals
January 2002 to End-June 2022

Sector	Total Debt						Net Debt					
	Level			% Change			Level			% Change		
	Q1	Middle 60%	Q5	Q1	Middle 60%	Q5	Q1	Middle 60%	Q5	Q1	Middle 60%	Q5
Communication Services	0.29	0.37	0.05	0.49	0.21	0.16	0.33	0.30	0.13	0.39	0.32	0.08
Consumer Discretionary	0.62	0.47	0.35	0.44	0.46	0.45	0.58	0.50	0.32	0.53	0.48	0.37
Consumer Staples	0.80	0.80	0.65	0.69	0.71	0.99	0.97	0.77	0.66	0.75	0.78	0.91
Energy	0.36	0.38	0.58	0.61	0.31	0.49	0.36	0.39	0.56	0.44	0.39	0.45
Health Care	0.71	0.72	0.73	0.55	0.74	0.81	0.72	0.78	0.57	0.72	0.72	0.71
Industrials	0.48	0.68	0.51	0.41	0.69	0.47	0.53	0.64	0.54	0.51	0.64	0.54
Information Technology	0.56	0.43	0.48	0.48	0.44	0.49	0.64	0.45	0.44	0.45	0.49	0.51
Materials	0.49	0.58	0.30	0.64	0.49	0.34	0.58	0.53	0.29	0.68	0.53	0.24
Utilities	0.52	0.66	0.41	0.77	0.61	0.30	0.44	0.68	0.45	0.77	0.64	0.24
Substance												
High	0.67	0.73	0.86	0.72	0.82	0.63	0.71	0.70	0.84	0.69	0.77	0.71
Mid	0.40	0.65	0.72	0.52	0.65	0.63	0.52	0.61	0.73	0.61	0.64	0.56
Low	0.29	0.64	0.65	0.49	0.64	0.40	0.41	0.59	0.65	0.56	0.68	0.30
Junk	0.51	0.39	0.50	0.38	0.48	0.35	0.53	0.39	0.48	0.39	0.51	0.27
Style												
Growth	0.60	0.45	0.46	0.43	0.49	0.40	0.55	0.47	0.47	0.46	0.54	0.40
Value	0.64	0.69	0.48	0.55	0.67	0.59	0.72	0.64	0.51	0.53	0.69	0.53
Neither	0.84	0.64	0.64	0.71	0.76	0.45	0.88	0.61	0.65	0.77	0.74	0.44
Overall												
	0.61	0.65	0.59	0.60	0.70	0.51	0.64	0.64	0.58	0.63	0.71	0.47

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