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TRIVARIATE RESEARCH

SELL-SIDE SIGNALS: BIAS YES, ALPHA NO

ADAM S. PARKER, Ph.D.,
adam@trivariateresearch.com
646-734-7070

CHANG GE, ANALYST
chang@trivariateresearch.com
614-397-0038

MAXWELL ARNOLD, ANALYST
maxwell@trivariateresearch.com
347-514-1234

RYAN MCGOVERN, DIR. OF RESEARCH SALES
ryan@trivariateresearch.com
973-271-8017

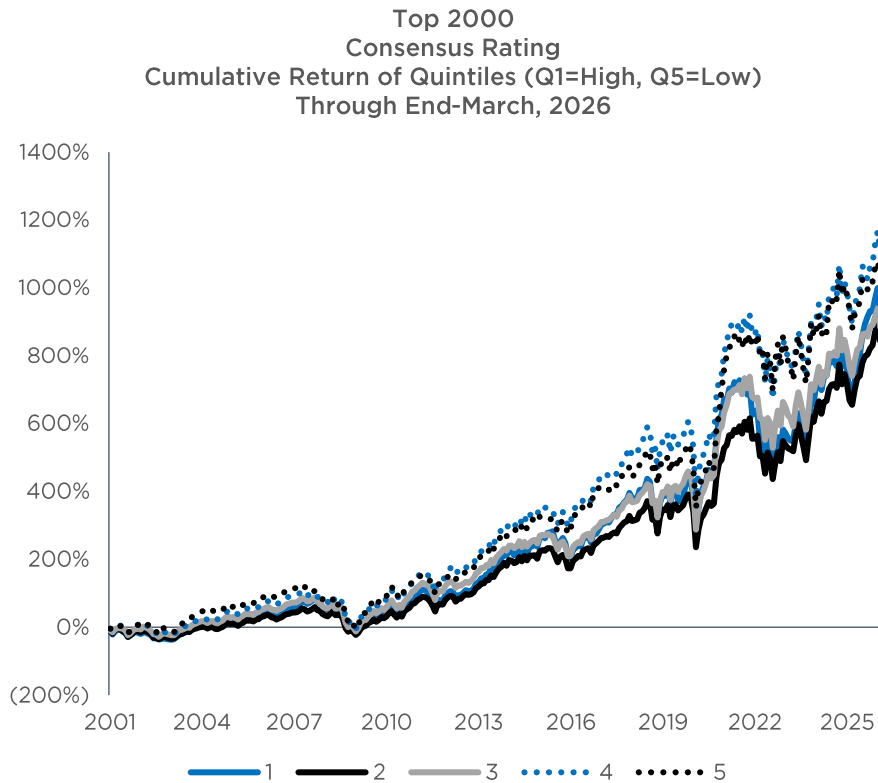
COLIN COONEY, HEAD OF SALES
colin@trivariateresearch.com
617-910-7934

BACKGROUND AND RESEARCH CONCLUSIONS

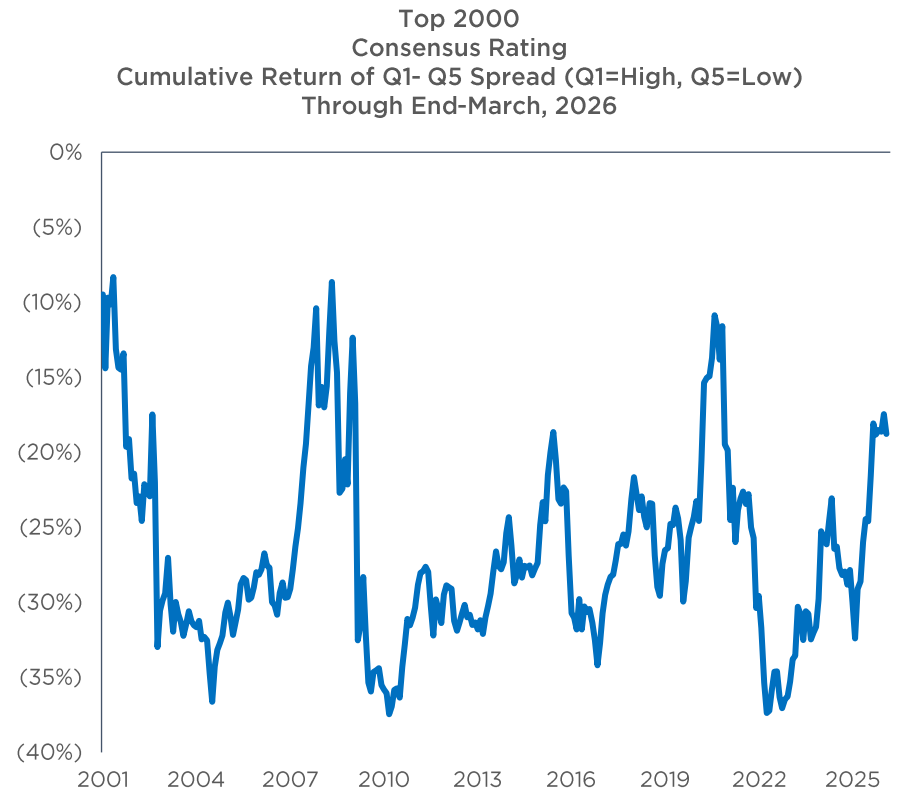
- Sell-side analyst ratings have historically provided **little to no predictive value** for stock performance. In fact, the least favored stocks by analysts have outperformed the most highly rated stocks over long periods.
- Changes in analyst sentiment, including upgrades and downgrades, **do not reliably signal future returns**. Recently upgraded stocks have not outperformed downgraded ones and, in many cases, have lagged.
- The **level of analyst price targets is not a useful indicator either**, but the *dispersion* of those targets does contain some signal. Stocks with tighter agreement among analysts (low volatility in price targets) have tended to outperform those with wide disagreement.
- Stocks with large implied upside to analyst price targets are often **recent underperformers rather than true alpha opportunities**. This signal worked in earlier periods but has provided no meaningful return over the past decade.
- Analyst stock recommendations show clear **systematic biases**, including a preference for growth and high-beta stocks. Sector-level distortions are evident, particularly in Healthcare, where buy ratings are at extreme highs despite weak performance.
- At the sector and industry level, analyst signals are **inconsistent and often counterproductive**. In some industries like Software and Real Estate, following analyst upgrades or price target increases has historically led to worse outcomes rather than better ones.
- While there are brief periods of apparent effectiveness (e.g., recent Semiconductor trends), these are **episodic and likely driven by momentum rather than evidence of sell-side analyst stock picking acumen**. Overall, relying on analyst ratings, changes, or price targets is not a successful investment strategy.

LOVED STOCKS WORK DURING RECOVERIES, BUT OTHERWISE LAG

The S&P Capital IQ (CIQ) database has a quintile summary score for the sell-side analyst recommendations. Ratings of 1 represent stocks that are loved, and ratings of 5 are those that are the most disfavored. We analyzed the subsequent cumulative return and found that the best performing stocks over the last 25 years have been those in the disfavored quintiles. The fourth and fifth quintile (i.e., the 40% of stocks least loved by the sell-side) historically have performed the best (left). Little cumulative deviation was realized between those rated in the middle of the pack vs. those most loved (the top quintile). Recently, loved stocks have beaten hated stocks (right), though we can see that this happened after junk stocks rallied post-COVID and the GFC as well. If history is a guide, avoiding loved stocks will be prudent going forward.



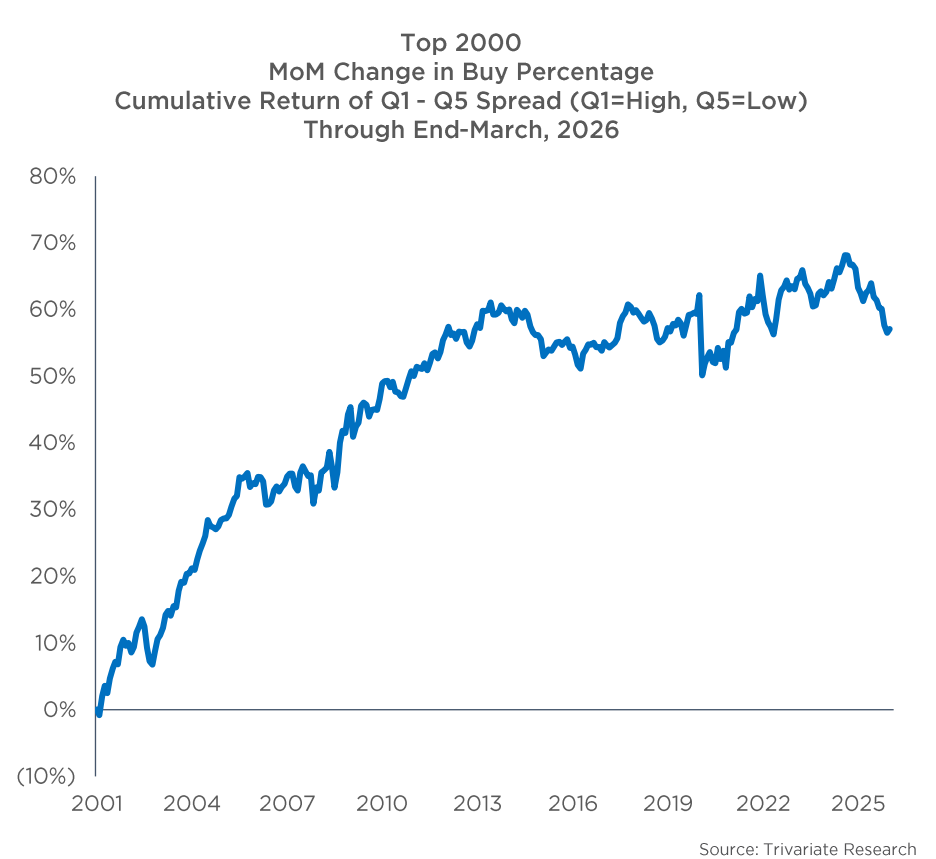
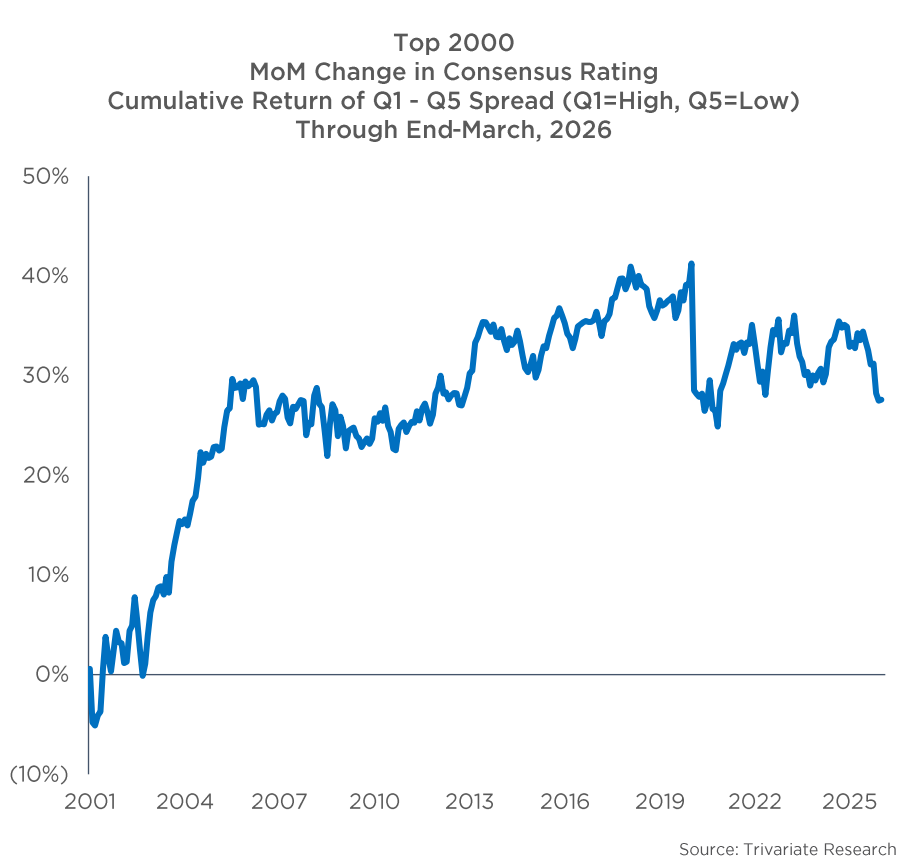
Source: Trivariate Research



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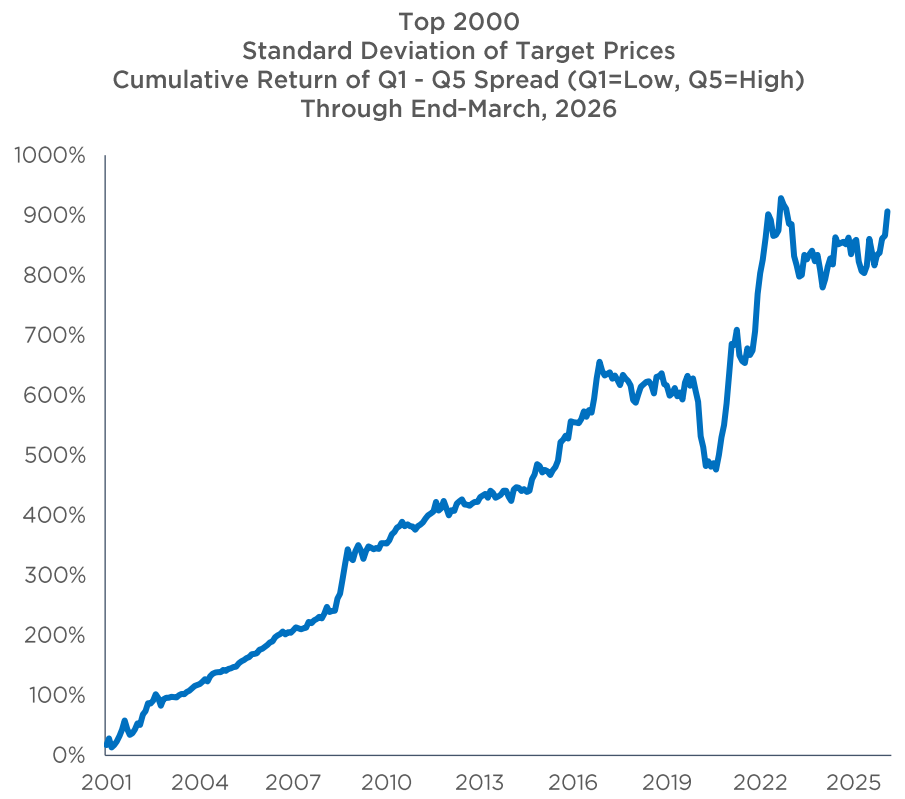
RECENT UPGRADES DON'T OUTPERFORM RECENT DOWNGRADES

It is not just the level of sell-side ratings that have limited predictive value, the change in analyst ratings and buy percentage have also been largely useless over the last decade. The month-over-month change in CIQ rating also wasn't an effective predictor of subsequent return, with increasingly liked stocks by analysts not outperforming those with recent downgrades over the last 20 years (left). We then looked for newly and incrementally loved stocks in terms of an increase in the Buy Recommendation percentage and compared their performance to those with the largest month-over-month decrease in Buy percentage. These incrementally loved stocks did beat the incrementally disfavored ones from 2001 through 2013 but generated no additional return over the last dozen years (right). **In general, recently upgraded stocks don't outperform recently downgraded stocks and have underperformed recently.** Bottom line, we wouldn't care if the sell-side got increasingly bullish on a stock.

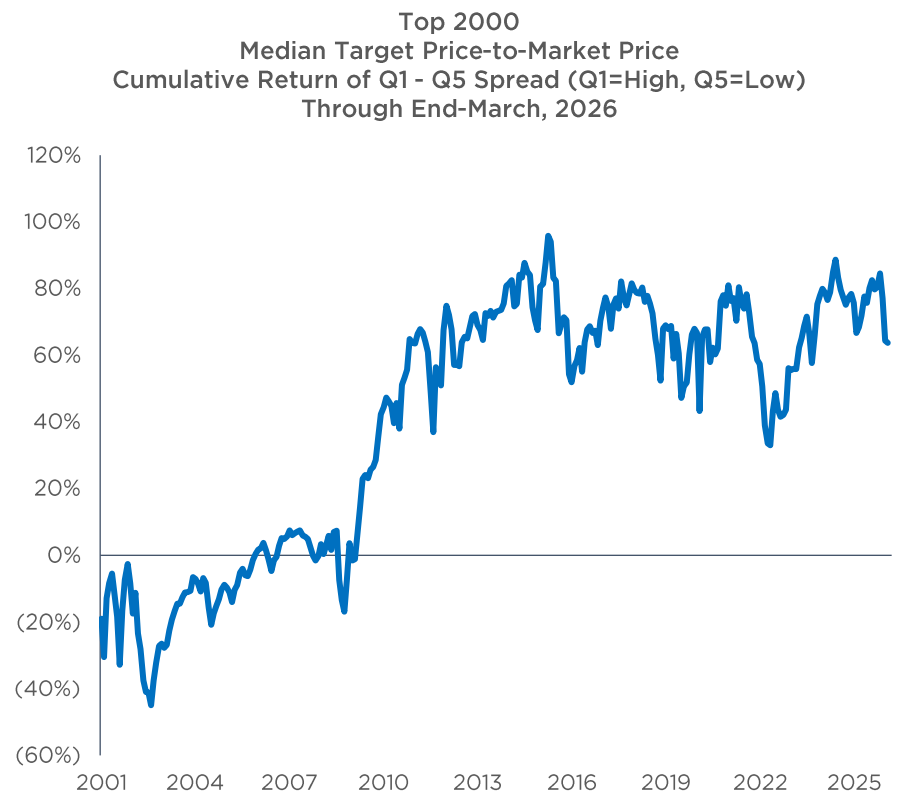


STOCKS WITH A NARROW RANGE OF PRICE TARGETS WERE BEST

While listening to and following sell-side ratings and changes to ratings has little value, there does appear to be slightly more information in the analyst price targets. We took the standard deviation of each stock's price target at each point in time and sorted by lowest to highest. Companies with the lowest standard deviation around their analyst price targets have tended to strongly outperform those with high variability in targets (left). The metric peaked in September of 2022, and had no efficacy between then and October 2025, but it has since moved back towards its peak. We interpret price target volatility as an uncertainty gauge. The distance between the median analyst price target and the current stock price is a form of price momentum. Stocks with "lots of upside" might be perceived as ones where lots of analysts are bullish, but they are often stocks that recently went down and the analysts were too bullish. Stocks with lots of upside were best from 2009-2016, but the signal has not generated any return over the last decade (right).



Source: Trivariate Research



Source: Trivariate Research

HEALTHCARE POSITIVE RATINGS SHOW CLEAR BIAS

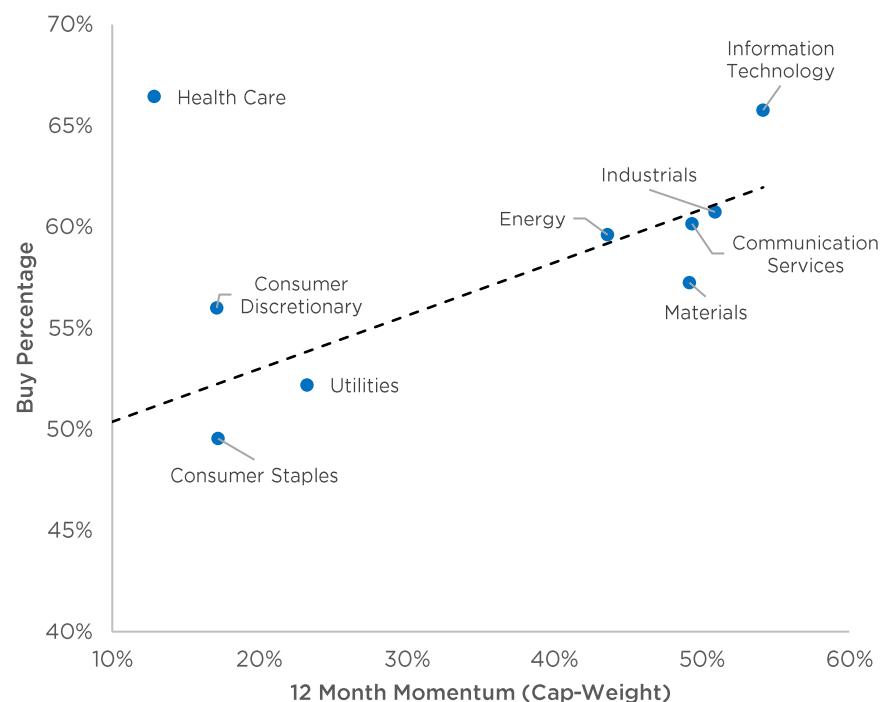
Interestingly, today, Healthcare stocks (excluding Biotechnology) have the highest Buy Recommendation Percentage among all sectors, with 66.4%, and only 2.2% of all recommendations are Sell (left). The sector is also tied with Technology for the best CIQ rating (1 is better than 5). Technology and Industrials are the next most loved sectors, with Real Estate and Consumer Staples having the lowest percentage of buy rated stocks (left). Usually, analysts chase performance and have a high percentage of buy ratings on stocks in sectors that have performed well. However, Healthcare (ex. Biotech) has the worst trailing 12-month performance and the highest percentage of buy ratings (right).

Analyst Ratings, Buy and Sell Percentages by Sector
As of End-March, 2026

Sector	Consensus Rating (CIQ)	Buy Rec. Percentage	Sell Rec. Percentage	Median Upside to Price Target (top quintile buy %)
Health Care (ex. Biotech)	1.89	66.4%	2.2%	46.7%
Information Technology	1.89	65.8%	3.9%	38.7%
Industrials	1.98	60.7%	4.0%	30.7%
Communication Services	2.03	60.2%	4.8%	28.1%
Energy	2.09	59.6%	8.3%	11.1%
Materials	2.03	57.2%	3.9%	22.7%
Consumer Discretionary	2.07	56.0%	5.7%	31.8%
Financials	2.19	52.3%	4.3%	28.6%
Utilities	2.14	52.2%	6.5%	12.6%
Consumer Staples	2.21	49.5%	6.8%	23.4%
Real Estate	2.18	48.6%	4.8%	24.6%

Source: Trivariate Research

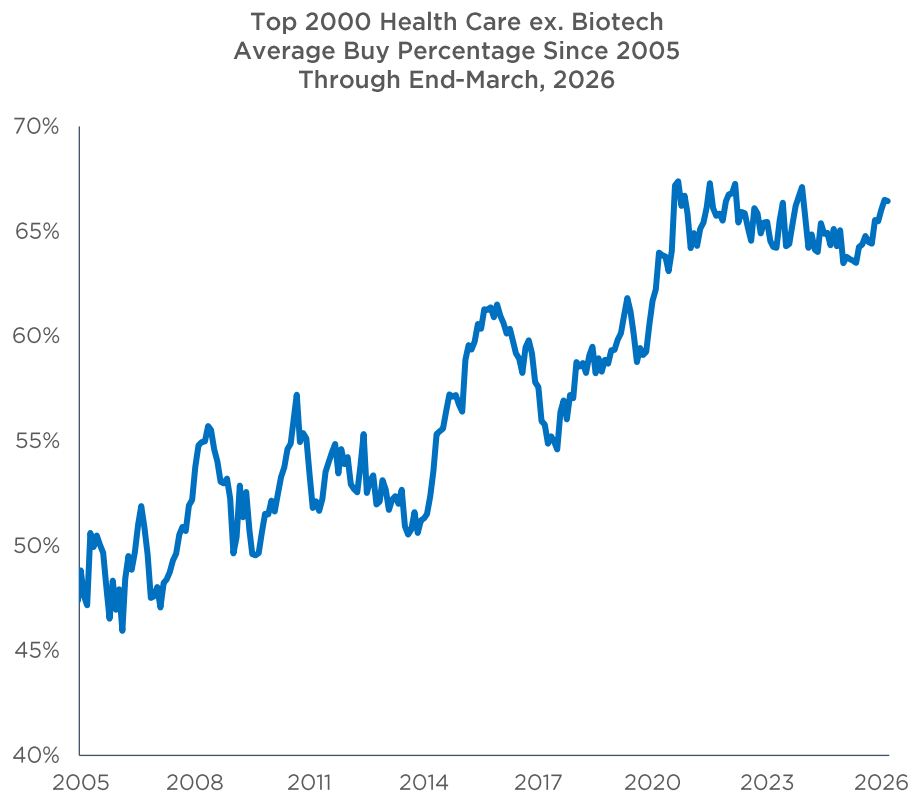
12 Month Momentum and Buy Percentages by Sector
As of End-March, 2026



Source: Trivariate Research

HEALTHCARE HAS NEVER HAD MORE BUYS AND FEWER SELLS

The percentage of Healthcare stocks that have a Buy rating is near 25-year highs (left), and the percentage of Healthcare stocks with Sell Ratings is near all-time lows (right), even though the sector's relative performance has been poor. This points out the biases of analyst ratings, where the plethora of deals, follow-ons, and other financial structures prevent unbiased analyst negativity.



Source: Trivariate Research

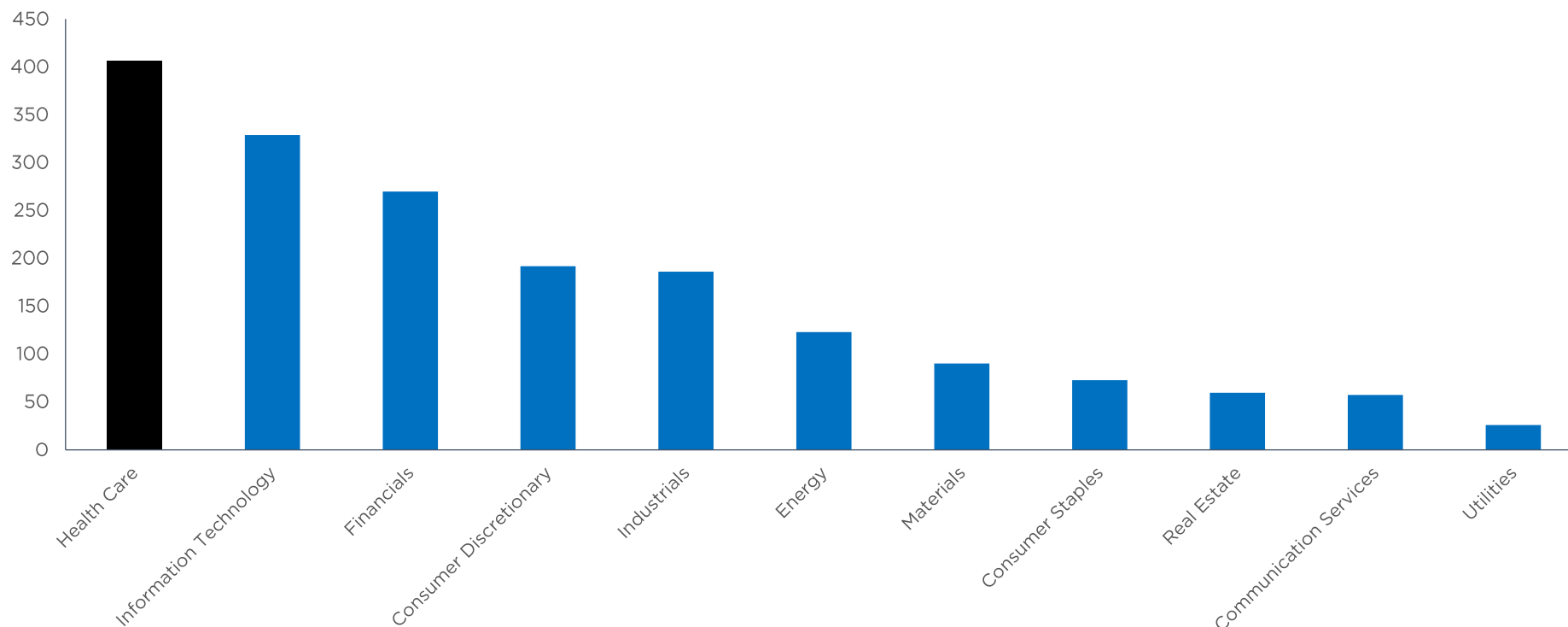


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PROOF THE HEALTHCARE ANALYSTS ARE BIASED TO THE POSITIVE?

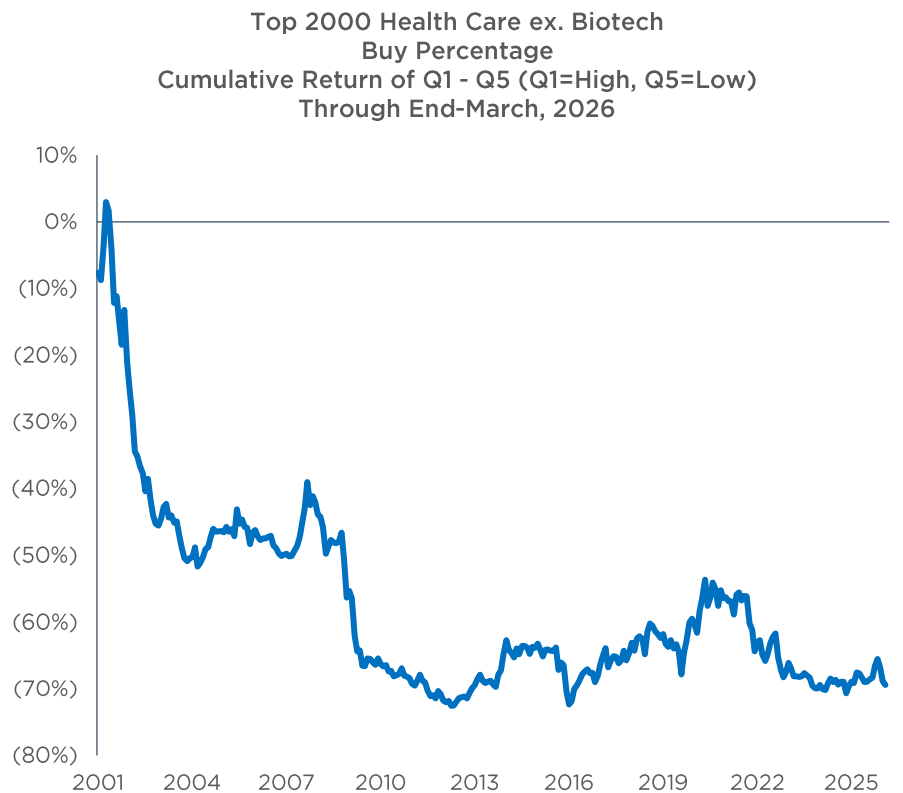
We wondered why Healthcare analysts had ratings and targets that seemed disproportionately bullish relative to price action and in absolute terms. Our best guess is that when you add up the total number of private placements, M&A, and spin-offs, the fact that Healthcare has the most transactions of any sector is the answer.

Average Number of Transactions Per Year by Sector
Private Placements, M&A, and Spin-Offs
Publicly Traded US Equities
Through End-March, 2026

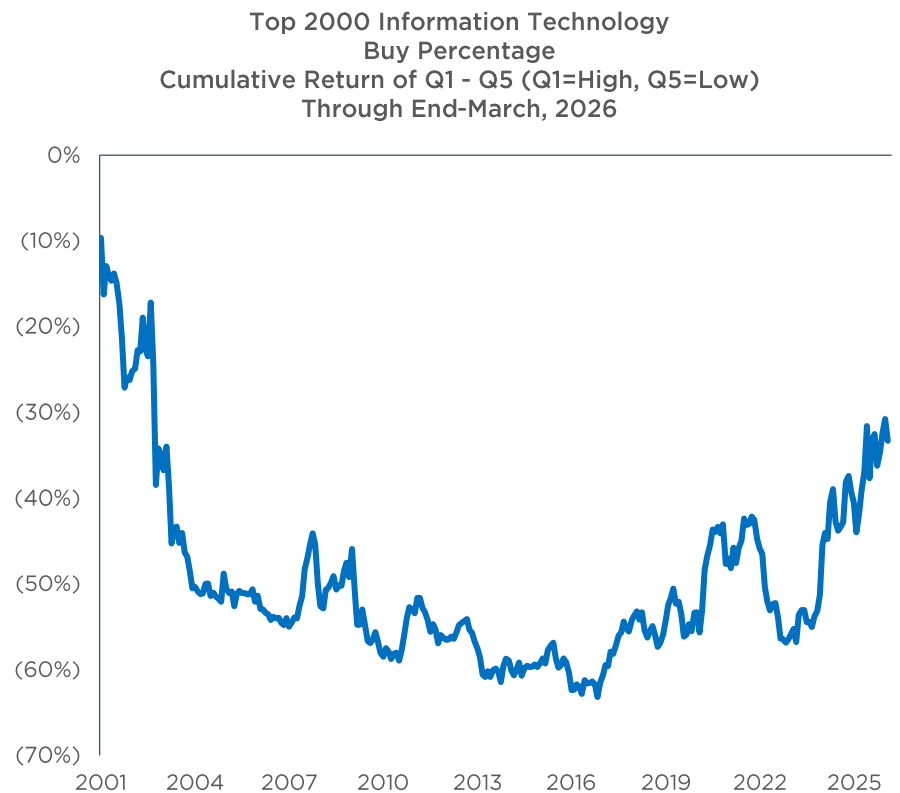


LOVED STOCKS LAG HATED ONES IN HEALTHCARE AND TECHNOLOGY

We were curious whether there was any predictive value in level or change of recommendations or price targets in certain individual sectors, recognizing that for the overall market there was limited value. Stocks in the top quintile of Buy Percentage in the Healthcare sector dramatically underperformed from 2001 to 2010 and have been flat since (left). We are recommending the Healthcare sector for a variety of reasons but can't say the increasing Buy percentage has us incrementally enthused. The same has been true in Technology, where the analyst recommendations were in aggregate useless until showing some efficacy since late 2023 (right). We interpret recent efficacy more as a function of price momentum than improving analyst skill.



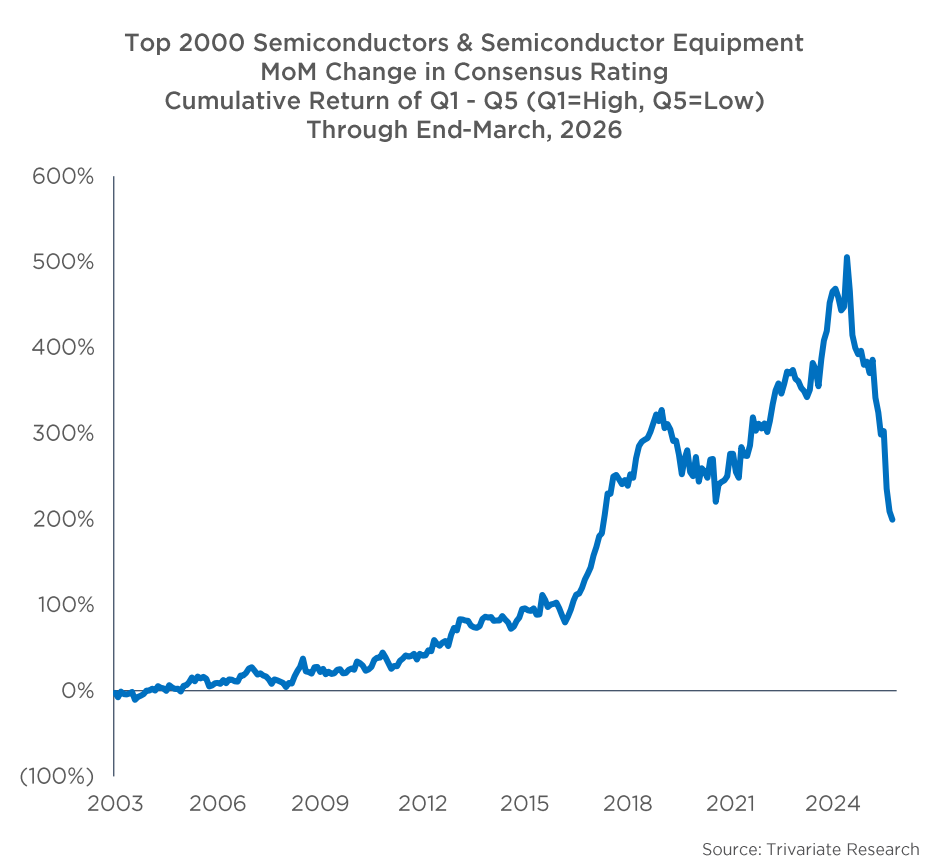
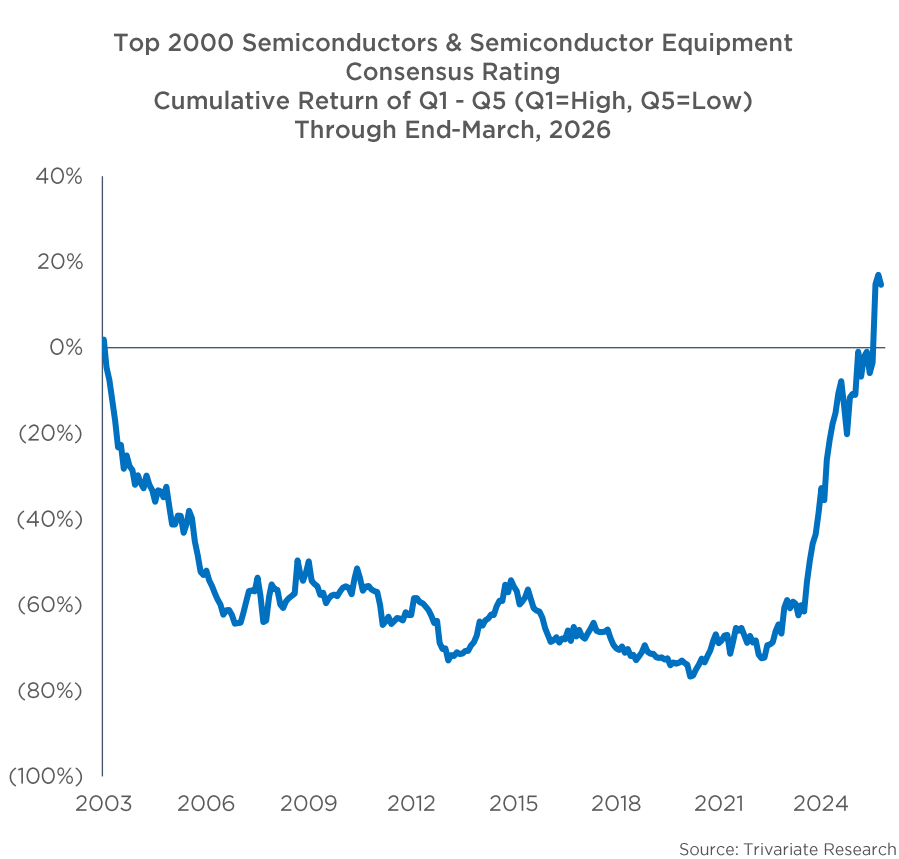
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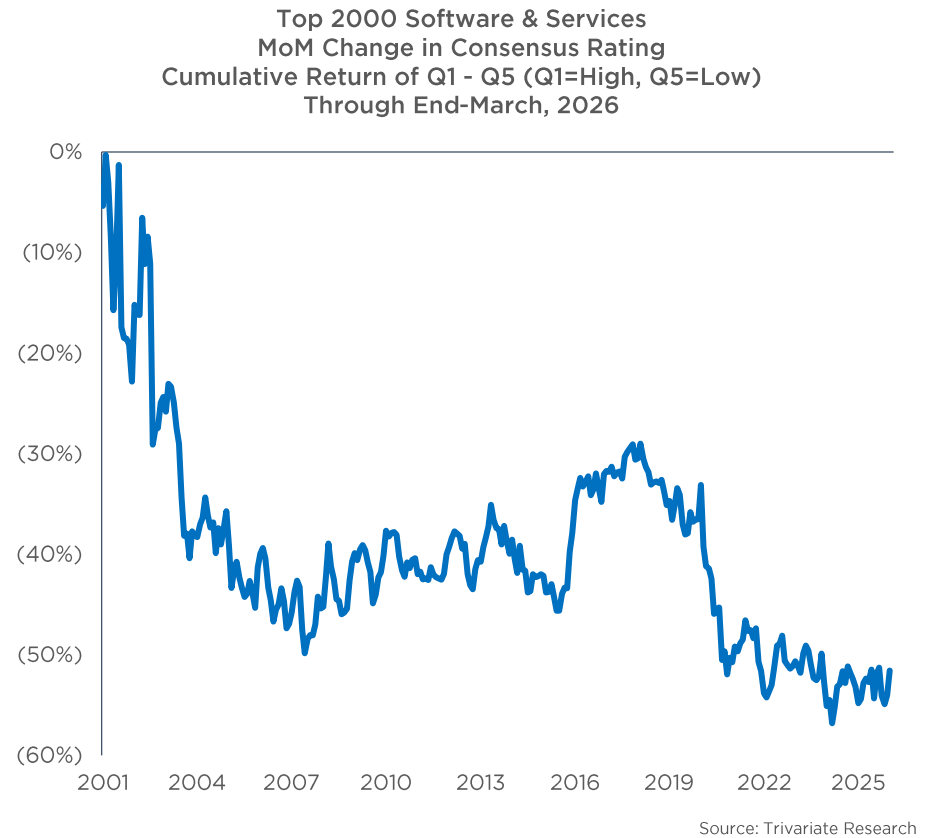
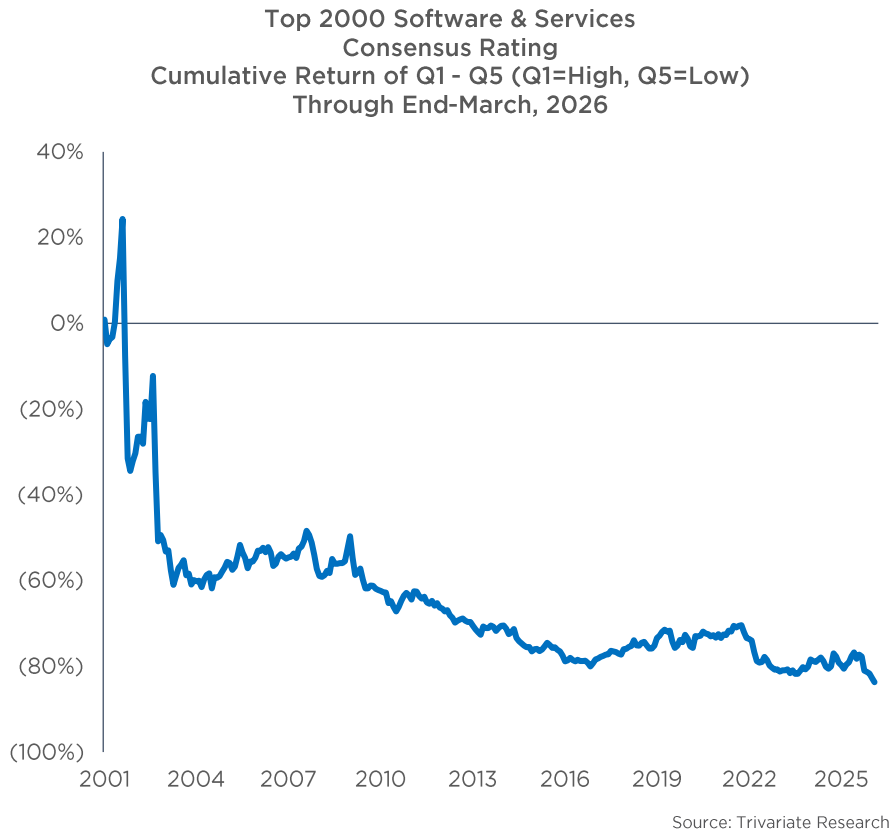
RATINGS LEVEL AND CHANGE HAVE MATTERED IN SEMIS SINCE 2023

The reason Technology analyst recommendations seem to have improved since 2023 is the Semiconductor industry, as analysts have been forced to “jump on board.” Analysts’ consensus ratings had no efficacy for Semiconductor stock selection for most of the last 25 years but has shown strong efficacy since November 2023 (left). Interestingly, change in consensus rating (buying upgrades and selling downgrades) worked well in Semiconductors through October 2024 before sharply reversing (right). For the last 18 months, owning Semiconductors that were loved by analysts but received incremental downgrades worked well. Likely, this was analysts using valuation or strong performance as a reason to downgrade the stocks.



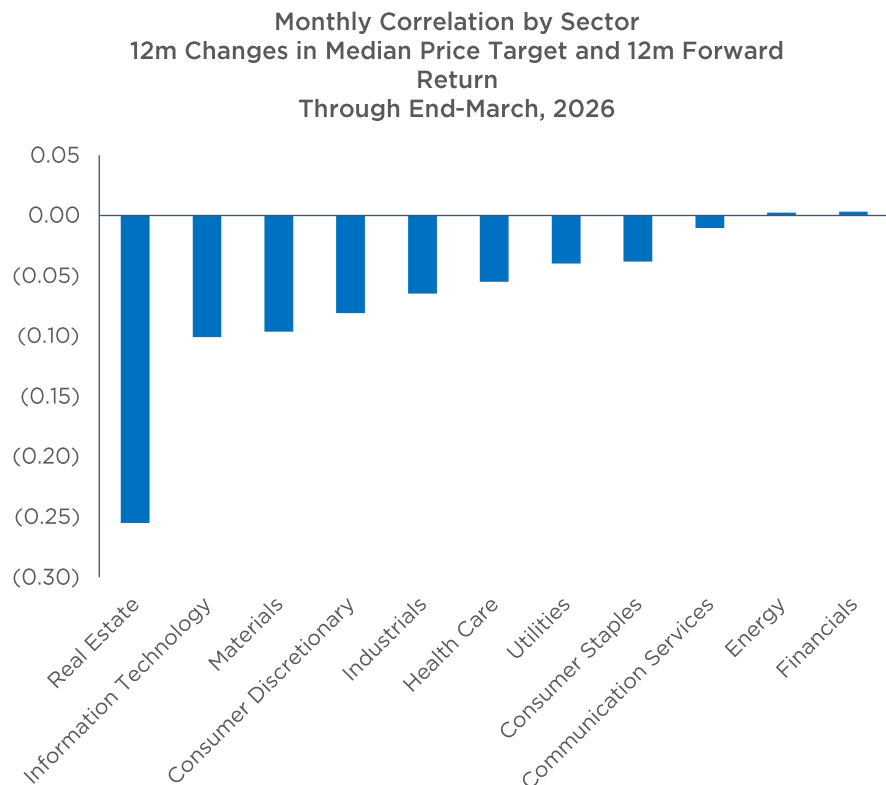
DO THE REVERSE OF ANALYST RECOMMENDATIONS IN SOFTWARE

Analysts' consensus ratings have never added value in Software (left), and since COVID, doing the opposite of analyst upgrades/downgrades has added incremental value in Software (right). Upgrades have historically performed worse than downgrades, though there has been close to zero value the last couple of years of ratings changes in Software (right).

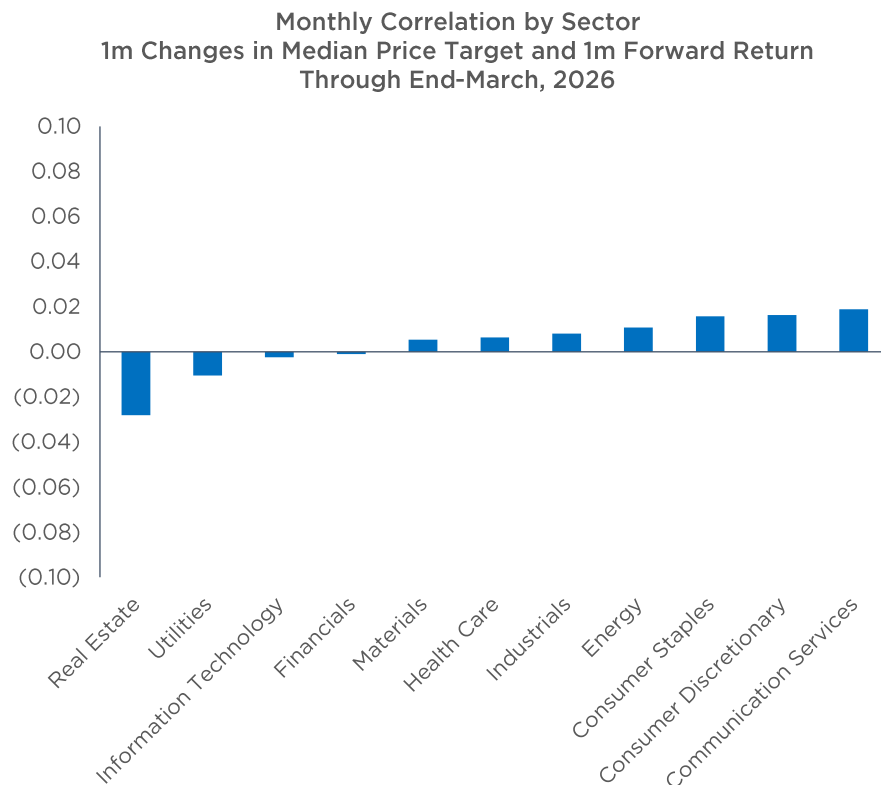


RAISING PRICE TARGETS HAS ZERO INFORMATION - AT BEST

We evaluated whether changes in analyst price targets have any information at the sector level. The answer is sell-side price target changes are somewhere between counter-indicators and useless, depending on the sector and horizon (left). For 9 of the 11 sectors, RAISING the price target on average results in LOWER return, though admittedly the impact is quite close to zero in Communication Services, Consumer Staples, and Utilities. On a one-month horizon, the average correlation between ratings change and subsequent performance is incredibly low across the board (right).



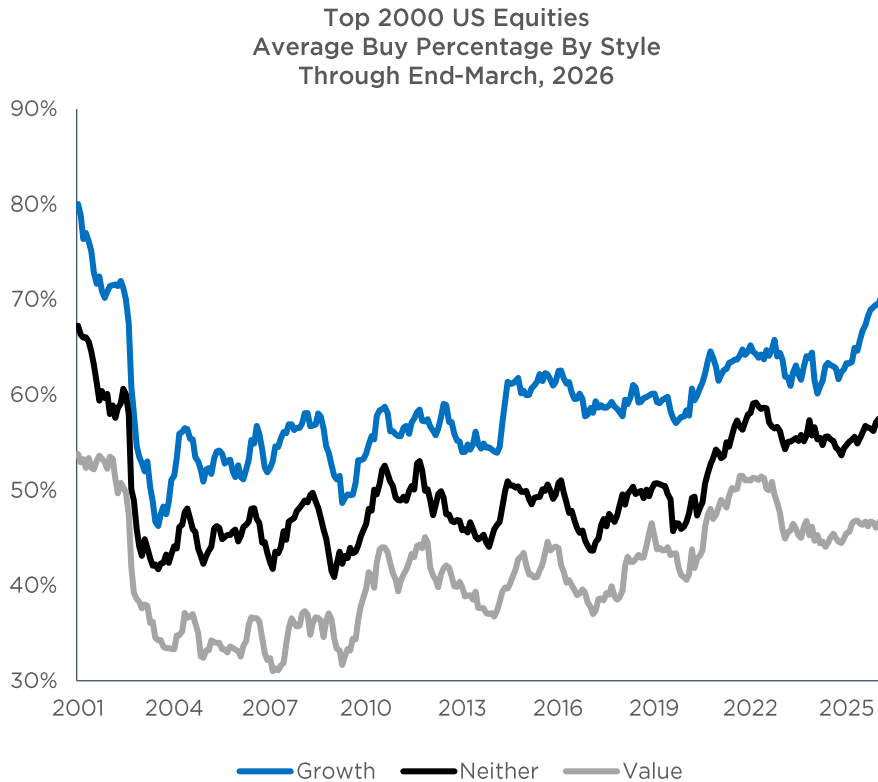
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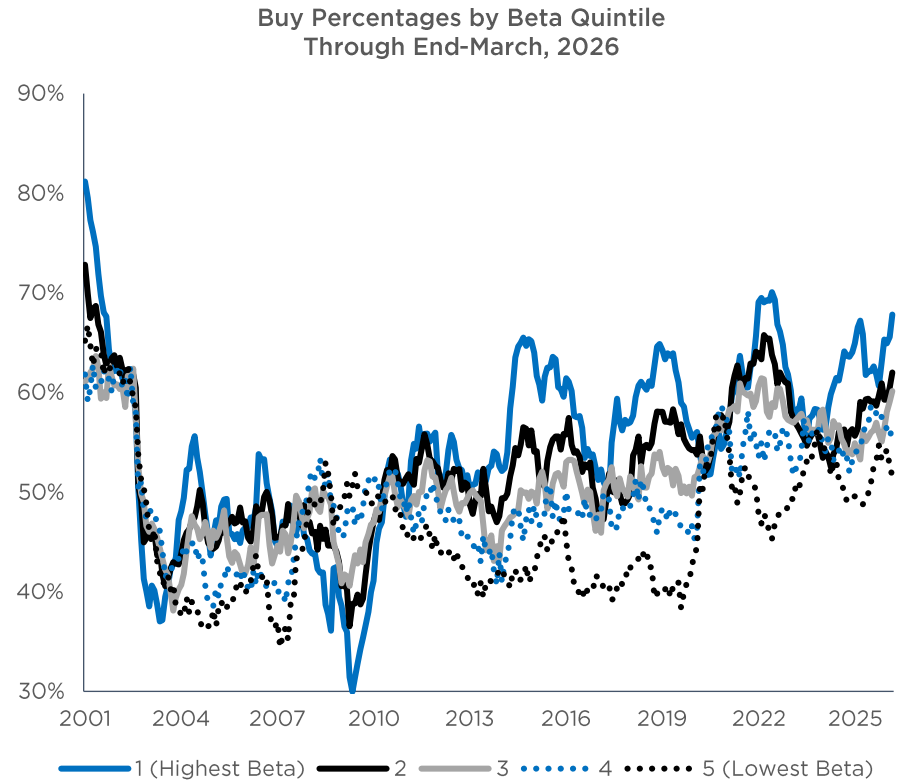
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ANALYSTS LOVE GROWTH STOCKS AND HIGH BETA STOCKS

Over the last 25 years, the average Buy Percentage is higher for growth stocks than for value stocks and the gap has grown recently (left). As of end-March, only 47.8% of analysts recommend the average Value stock with a “Buy” vs. 71.1% for Growth stocks. Analysts also are biased toward higher beta stocks, recommending 67.8% of the highest beta quintile vs. 51.6% in the lowest beta quintile.



Source: Trivariate Research



Source: Trivariate Research

QUALITY ISN'T STRONGLY ASSOCIATED WITH BUY PERCENTAGE

While analysts have far more buy ratings on growth stocks than value stocks, they have no such collective biases when it comes to quality. The CIQ ratings and buy percentages are largely the same by all quality quartiles, except a touch worse for the junk bucket (left). Analysts' recommendations had been particularly bad among junk stocks up to late 2022 but have been better since – likely because Junk has outperformed quality over the last few years. Overall, buying stocks with high buy percentage and shorting low buy percentage junk stocks has lost money since 2001 with sharp drawdowns during both the Financial Crisis and COVID (right). This means relying on analysts for their loved junk stocks during crises is a particularly bad idea.

Average Analyst Sentiment by Substance
As of End-March, 2026

Substance	Consensus Rating (CIQ)	Buy Recommendation Percentage	Sell Recommendation Percentage
High Quality	2.01	59.0%	3.9%
Mid Quality	2.01	59.3%	3.5%
Low Quality	2.02	60.2%	4.6%
Junk Quality	2.15	53.4%	6.3%

Source: Trivariate Research

Top 2000 Junk Quality
Buy Percentage
Cumulative Return of Q1 - Q5 Spread (Q1=High, Q5=Low)
Through End-March, 2026



Source: Trivariate Research

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