When Analysts Change Their Minds

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Abstract

Sometimes the best equity investments are not necessarily the most beloved companies. Contrary to intuition, investors can capture outsized returns by investing in stocks that are not the highest rated by analysts, but are becoming better rated. Analysts usually are not wrong, but often can be late. By the time analysts collectively come to love a stock, it may be too late to buy as most of the upside has already been priced in. This article proposes an alternatve method to capture useful information in consensus analyst ratings: avoid the consensus buy recommendations from analysts and instead invest in stocks whose consensus analyst ratings have improved the most in the recent past. These are the stocks, which analysts have begun to change their minds about without converging into a bullish consensus, in other words the turnaround companies. Such a strategy has steadily and significantly outperformed the market over the past 20 years. This article examines analyst ratings as a systematic metric and provides a rationale for why such a contrarian strategy has performed well over the long run.

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Introduction

Investors famously have a love and hate relationship with Wall Street analysts. Analysts are trusted and closely followed because they usually possess deep knowledge about the industries they cover. They keep close track of individual company fundamentals, uncover new information and often directly engage with management. The fact that analyst upgrade and downgrade recommendations instantaneously move stock prices reflects the weight that investors place on their knowledge and analyses.

Analysts are also often mistrusted and are commonly perceived as having a bullish bias especially those on the sell-side[2]. One common refrain is that analysts may be right but often late[3]. Investors are rightly concerned that by the time the analysts come to rave about a stock the stock price may have already surged with most of the good news baked in, leaving behind limited upside. But, even in these cases, analyst opinions are still closely followed as sentiment signals.

Given these perspectives, it should come as no surprise that Analyst Recommendations (ANR <GO>) is one of the most frequently visited functions on the Bloomberg Terminal. Besides listing individual analyst's recommendations, price targets and track record, the ANR function collects and consolidates stock recommendations from across Wall Street banks and other financial research institutions into a standardized consensus rating system[4].

So how should investors take advantage of the information contained in analyst ratings? One obvious thing to do is to invest in stocks with the highest current consensus. Indeed, the Bloomberg Analyst Recommendations Index (USANR) comprises the 50 stocks in the US large and mid-cap index with the strongest consensus analyst recommendations. These stocks typically represent high growth companies with glamorous characteristics.

There is a different and less obvious way to incorporate analyst recommendations as stock selection signals. That is to look at the changes in analyst ratings rather than the current levels of the ratings. This is the focus of this article. The Bloomberg ANR Improvers index consists of stocks whose consensus ANR ratings are not recommended buys. Instead, they have shown the most improvements over the past six to 12 months. Such a strategy offers a differentiated profile of risk-return by picking up turnaround or cyclically recovering companies or a basket of "contrarian bets" that has outperformed the broader benchmark over the past 20 years.

This article adds to a rich literature on the value of analyst ratings specifically those on the link between consensus analyst recommendations and the predictability of cross-sectional stock returns. Barber et al. 2001 documents the potential to earn higher returns by buying the most highly recommended stocks and short selling the least recommended. Jegadeesh et al. 2005 and Barber et al. 2010 both document that stocks with positive changes in analyst recommendations earn large excess returns that are orthogonal to other well-known factors.

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[2] A large academic literature, e.g., Ivković and Jegadeesh 2004, Jegadeesh et al 2005, Jegadeesh and Kim 2006, has documented that analysts tend to overly optimistic, especially in their early forecasts, which are gradually revised downward over time. This results in an overall favorable bias in analyst recommendations.

[3] See in the appendix section 2, a discussion about the comparison of ANR Improvers with ANR Leaders or top-rated stocks.

[4] Different Wall Street firms use different terminologies for their stock recommendations. Some use language like strong buy, buy, hold, sell and strong sell, while others use words such as Outperform, Market Perform, Underperform etc. Bloomberg consolidates different rating languages and scales across all participating financial institutions into a common average consensus score 1-5, with 5 being strong buy and 1 being strong sell.

Analyst Recommendations

Investors typically pay attention to individual stock analyst ratings but most probably do not know how these ratings have materialized and evolved over time in the aggregate. This section starts with an overview of consensus analyst recommendations. Given the focus of this article, data is presented on the consensus recommendations and not individual analyst recommendations[5].

Analyst ratings are produced by analysts. Investors may be rightly concerned that the way analyst ratings are produced may have changed significantly over time. Indeed, regulatory reform that has been both explicitly and implicitly[6] aimed at unbundling equity research from trading services has led to cost pressure on sell-side research. Nevertheless, over the past two decades the distribution of analyst ratings has been remarkably stable.

Table 1: Summary Statistics of Bloomberg Analyst Rating Consensus Scores in the US and Europe

DATE	Bloomberg US Large and Mid-Cap				Bloomberg Europe Dev Markets Large and Mid-Cap			
	ANR Median	ANR StDev	ANR Improv Median	ANR Improv StDev	ANR Median	ANR StDev	ANR Improv Median	ANR Improv StDev
2003	3.73	0.60	-0.19	0.39	3.59	0.60	-0.06	0.41
2006	3.87	0.57	0.00	0.37	3.66	0.66	0.06	0.48
2009	3.87	0.56	-0.04	0.36	3.46	0.66	-0.15	0.48
2012	4.00	0.52	-0.03	0.29	3.68	0.61	-0.11	0.37
2015	3.97	0.52	-0.01	0.29	3.55	0.57	-0.01	0.35
2018	4.02	0.55	0.05	0.29	3.73	0.60	0.07	0.37
2021	4.10	0.58	0.05	0.29	3.87	0.63	0.06	0.35
2024	4.04	0.54	-0.02	0.29	3.86	0.58	-0.02	0.33
Average	3.95	0.56	-0.02	0.32	3.68	0.61	-0.02	0.39

Source: Bloomberg. Note: ANR is the analyst consensus score of stock. ANR Improv is the ANR improvement score, which is defined as $[(ANR_{current} - ANR_{t-6months}) + (ANR_{current} - ANR_{t-12months})]/2$. For either given metric, "median" is the median value of all constituents of the Bloomberg US Large and Mid-Cap index (US Index) or the Bloomberg Europe Developed Markets Large and Mid-Cap Index (EDM Index) within a given year. StDev is the standard deviation of all constituents of the US index or the EDM index within a given year.

Table 1 shows the distribution of ANR consensus and improvement scores in the US and Europe[7] since 2003. In both markets, ANR scores have shown very similar trends. Recall that the Bloomberg ANR consensus rating is a number that ranges from 1 ("Strong sell") to 5 ("Strong buy"). In both markets, the average rating of a stock has increased over 20 years. The median consensus scores have increased from 3.73 to 4.04 in the US and 3.59 to 3.86 in Europe. That's about half a unit of standard deviation, which averages around .55-.66 in each case.

Furthermore, in both markets the median ANR improvement scores have stuck closely around 0. In other words, equal number of upgrades and downgrades, which helps allay fears of the 'improvers signal' being distorted by a general trend towards the so-called

[5] There is a large literature on both consensus analyst recommendations as well as individual analyst recommendations. For example, Barber et al 2001, Jegadeesh et al. 2005 document consensus analyst ratings as return predictors. Barber et al. 2010 and Log and Stulz 2010 document the predictive value of individual analyst ratings.

[6] MiFID II (Markets in Financial Instruments Directive II) is a European Union legislation that came into effect in January 2018. The FCA in the UK has made certain adjustments to MiFID II, reversing some unbundling of research and trading services. In the US, no similar legislation was adopted but the Department of Labor and the SEC have encouraged or studied similar unbundling.

[7] The main text of the article focuses on the US and European developed markets. Data on other markets can be found in the appendix.

"ratings inflation". Standard deviations of ANR improvement scores are slightly higher in the 2000s than in the 2010s, likely reflecting a reduction of global macroeconomic and financial volatilities over the past decade.

Table 1 also highlights some interesting differences in the US and European markets. The median ANR consensus score is consistently higher in the US than in Europe, averaging 3.95 and 3.68 respectively over the past two decades (4.05 and 3.75 in the last decade). This means that about half of the stocks in the US are rated as "buy" or "strong buy", while in Europe analyst recommendations seem to be meaningfully more conservative -- even before the MiFID legislative reforms. This suggests that investors' suspicion of Wall Street analysts' "bullish bias" may indeed be valid in the US[8].

An interesting case in point: on May 14, 2024, the consensus ratings of Eli Lilly (LLY US Equity) and Novo Nordisk (NOVOB DC Equity) are 4.42 and 3.97 respectively. These two companies are leading innovative pharmaceutical companies in the US and Europe with current market darling GLP-1 based weight-loss drugs. Yet, whereas Eli Lilly is rated as a strong buy by most analysts, Novo Nordisk's consensus score falls short of even a buy.

Table 2: Summary Statistics of Bloomberg Analyst Rating Consensus Scores Across Sectors

Sector Name	Bloomberg US Large and Mid-Cap				Bloomberg Europe Dev Markets Large and Mid-Cap			
	ANR Median	ANR StDev	ANR Improv Median	ANR Improv StDev	ANR Median	ANR StDev	ANR Improv Median	ANR Improv StDev
Communications	4.02	0.58	-0.01	0.31	3.70	0.56	-0.01	0.34
Consumer Discretionary	4.00	0.55	0.00	0.31	3.74	0.58	0.00	0.37
Consumer Staples	3.74	0.59	-0.01	0.33	3.56	0.59	0.00	0.38
Energy	4.18	0.50	-0.01	0.29	3.88	0.55	0.00	0.37
Financials	3.84	0.61	0.00	0.33	3.63	0.68	0.01	0.40
Health Care	4.11	0.50	0.00	0.31	3.71	0.59	0.00	0.35
Industrials	3.93	0.53	0.00	0.32	3.71	0.61	-0.01	0.36
Materials	3.92	0.45	0.01	0.33	3.71	0.57	-0.02	0.39
Real Estate	3.81	0.53	0.00	0.30	3.67	0.58	0.00	0.41
Technology	4.00	0.52	0.00	0.29	3.78	0.49	0.02	0.33
Utilities	3.77	0.57	0.00	0.33	3.54	0.59	0.00	0.40

Source: Bloomberg. Note: ANR is the analyst consensus score of stock. ANR Improv is the ANR improvement score, which is defined as $[(ANR_{current} - ANR_{t-6months}) + (ANR_{current} - ANR_{t-12months})]/2$. For either given metric, "median" is the median value of all constituents of the Bloomberg US Large and Mid-Cap index (US Index) or the Bloomberg Europe Developed Markets Large and Mid-Cap Index (EDM Index). StDev is the standard deviation of all constituents of the US index or the EDM index. Each value in the table is the median value of each sector from Jun 2003 through Mar 2024.

Table 2 shows the summary statistics of ANR ratings across sectors in the US and Europe. Once again, the median consensus rating is higher in the US than Europe on a sector-by-sector basis. There is a moderate degree of variations in the medians and the standard deviations of ANR consensus scores. Particularly notable are the consumer staples, utilities, and real estate sectors, which have noticeably lower median consensus scores than the other

[8] Interestingly, as shown in the appendix, US and EM analysts are both more bullish than European analysts, suggesting this phenomenon is not driven by stock quality or performance.

sectors. However, the median ANR improvement scores are close to zero and the standard deviations of ANR improvement scores are similar across sectors. This lends credence to the approach of selection for the whole cross section on an ex-ante basis.

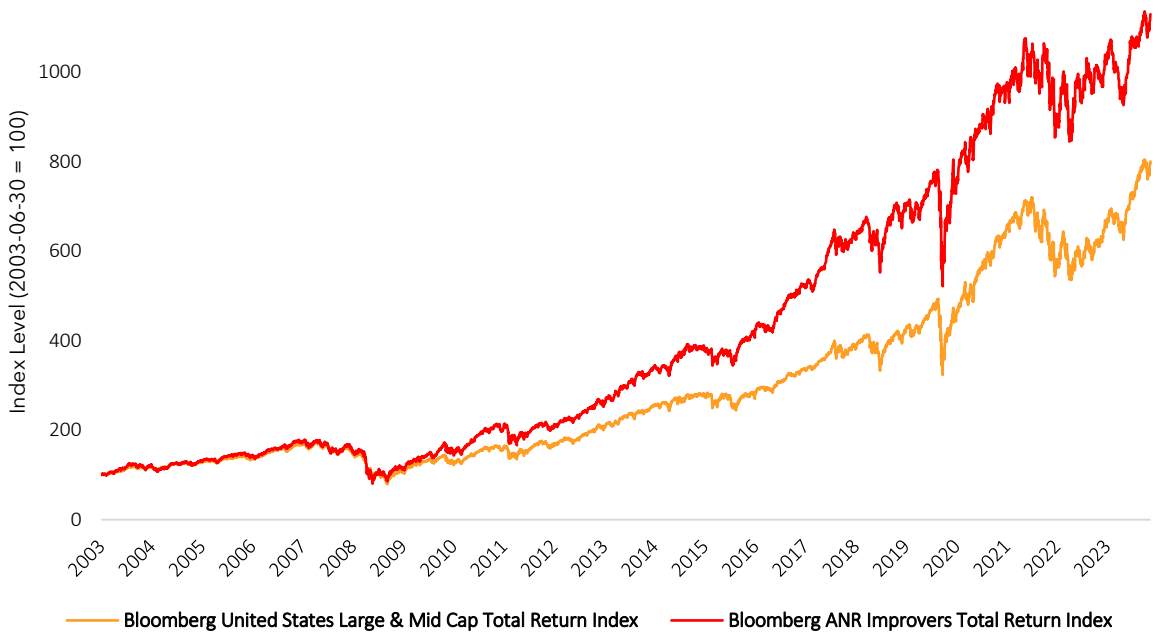
Bloomberg Analyst Rating Improvers Index

If analysts on average have a bullish bias, a natural way to take advantage of the information value of analyst ratings is to look at changes or improvements. Instead of buying stocks that are rated by analysts as buys, such a strategy would invest in stocks that have seen their consensus ratings increase the most in the recent period. This is exactly the philosophy underlying the Bloomberg Analyst Rating Improvers Index (BANR Index).

$$\boldsymbol{ANR\ Improvement\ Score} = [(\boldsymbol{ANR_{current}} - \boldsymbol{ANR_{t-6months}}) + (\boldsymbol{ANR_{current}} - \boldsymbol{ANR_{t-12months}})]/2$$

Starting with the Bloomberg US Large and Mid-Cap Index (US Index), among securities with a consensus ANR rating less than 4 (not a buy), at least five years' worth of gross margin data and with more than 10 analysts covering each stock[9], the BANR Index selects 50 securities with the greatest average increase in ANR consensus rating from six and 12 months ago. Upon selection, the index is then equally weighted and quarterly reconstituted and rebalanced.

Figure 1: Performance of Bloomberg ANR Improvers Index since 2003



Source: Bloomberg, Jun 30, 2003 - May 10, 2024.

The cumulative returns of the BANR Index are depicted in Figure 1 and the summary statistics are shown in Table 3. Over the past 20 years, the BANR Total Return Index has significantly

[9] Except the threshold rule for current consensus rating being less than 4, the other eligibility rules are complementary to the ANR improvement score signal, but not essential to the intuition. Missing from the listing is also a liquidity threshold that the average daily trading volume of trailing 90 days be more than $10MM, which is a relatively conservative threshold ensuring sufficient liquidity and low trading costs. Details of the index methodology can be found here.

outperformed the US Large & Mid-Cap Total Return Index (UST Index) benchmark (and the stock selection universe). On an annual basis this has translated into an excess return of 1.8% per year with a market beta close to 1. Because the index is tilted toward idiosyncratic risks (companies turn around for different reasons), it has realized slightly higher volatility than the market. This will be discussed in greater detail below.

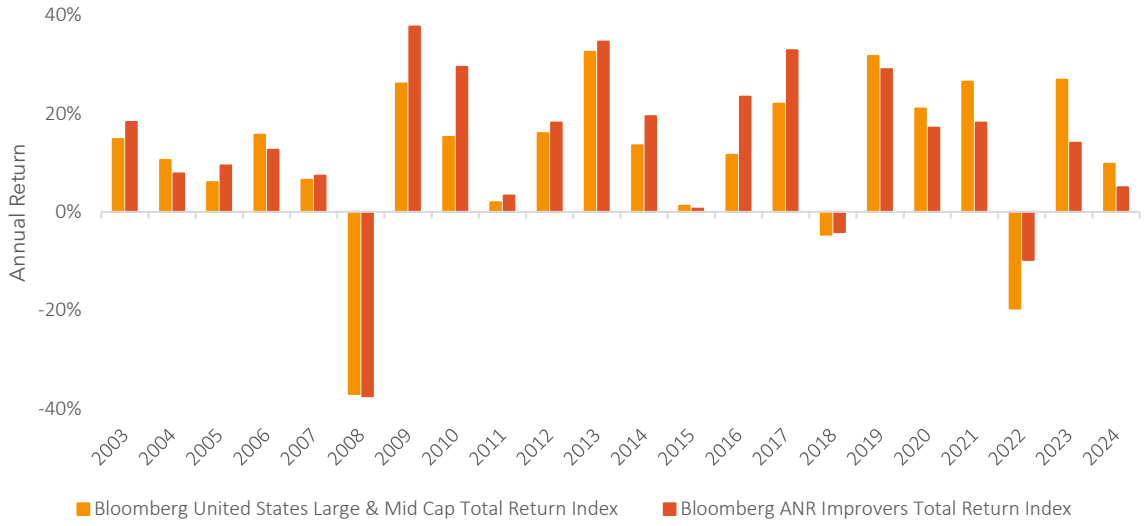
Table 3: Summary Statistics of Bloomberg ANR Improvers Index (US)

	Bloomberg US Large and Mid-Cap	Bloomberg Analyst Rating Improvers Index
Time Period	2003-06-30 - 2024-05-10	2003-06-30 - 2024-05-10
Cumulative Return	700.03%	1028.53%
Annualized Return	10.42%	12.25%
Volatility	18.86%	19.59%
Downside Volatility	15.36%	15.53%
Sharpe Ratio	0.55	0.63
Dividend Yield	1.61%	1.68%
Max Drawdown	-54.86%	-55.10%
Annualized Excess Return		1.80%
Annualized Tracking Error		6.14%
Information Ratio		0.29
Up Capture Ratio		1.01
Down Capture Ratio		0.99
Correlation		0.95
Beta		0.99
Alpha		1.94%

Source: Bloomberg.

While the BANR index has outperformed the broader market over the long run, it has gone through rough patches too. As seen in Figure 2, on an annual basis, after outperforming in 2003, the index underperformed the market in 2004, 2006, and 2008 before outperforming again for almost nine years in a row. Since 2019, the index has started underperforming the market again except for in 2022, where it realized a smaller drawdown.

Figure 2: Annual Returns of Bloomberg ANR Improvers Index



Source: Bloomberg.

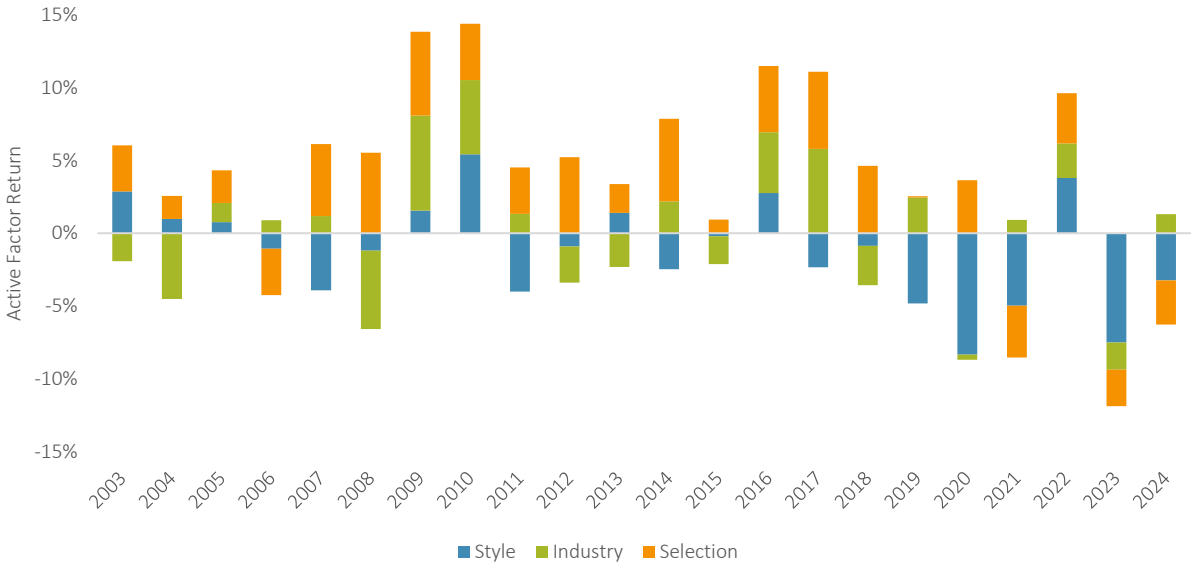
The following sections will drill deeper into why the ANR improvers signal may have underperformed the last couple years and offer some clues as to when it may perform strongly again. One particularly interesting and unique thing about the BANR index (and the ANR improvers signal) is the orthogonality of its returns. One of the best ways to show this is to look at a factor-based attribution of the active returns of the index.

Factor Footprints and Return Attribution

Leveraging Bloomberg's 3rd generation Multi-Asset Class (MAC3) risk model, the active returns of the BANR index can be decomposed into different sources of returns in terms of commonly known equity style and industry factors. Figure 3 shows the attribution results at the aggregate level. Remarkably, between 2003 and 2019, while contributions of the style and industry factors have been positive and negative, in every single year except 2006 the BANR index has realized a positive *selection effect* or non-factor return.

Since 2020, along with the index's underperformance relative to the benchmark, the signs of the selection effect have been mixed. In particular, the negative selection effect seems to coincide with the years in which BANR underperforms the benchmark. This suggests that the underperformance is likely not random, but indeed the improvers or turnaround factor along with its associated other style factors happen to not be favored by the market at the time.

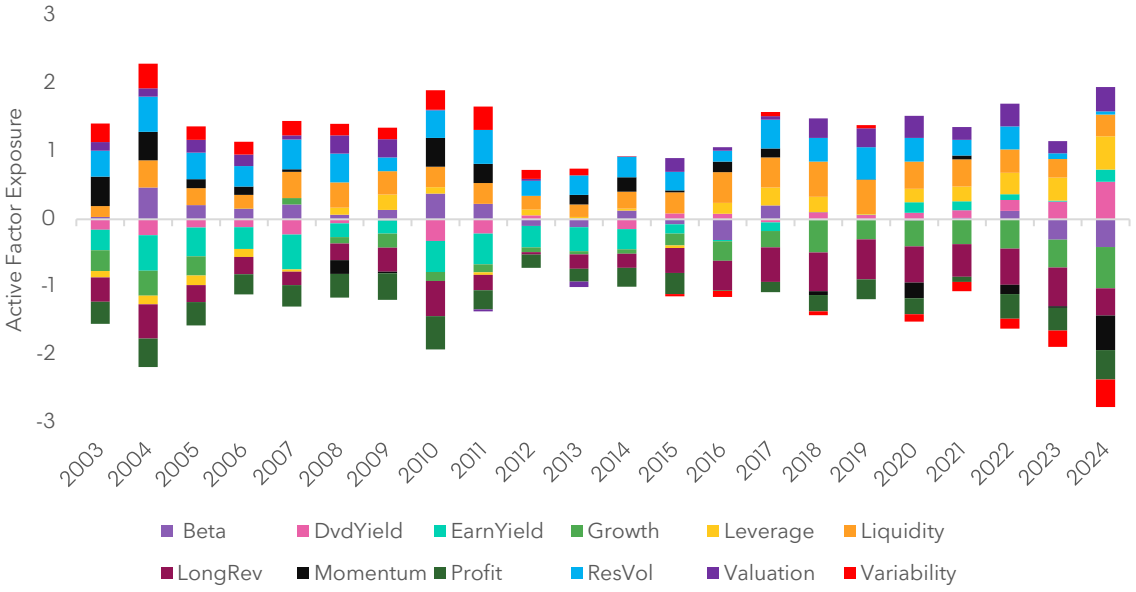
Figure 3: Factor-based Attribution of Active Returns of the Bloomberg ANR Improvers TR Index



Source: Bloomberg. Note: active returns are the differences between the annual returns of the Bloomberg ANR Improvers Total Return index and the annual returns of the Bloomberg US Large & Mid-Cap Total Return Index. The factor-based attribution is calculated using Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

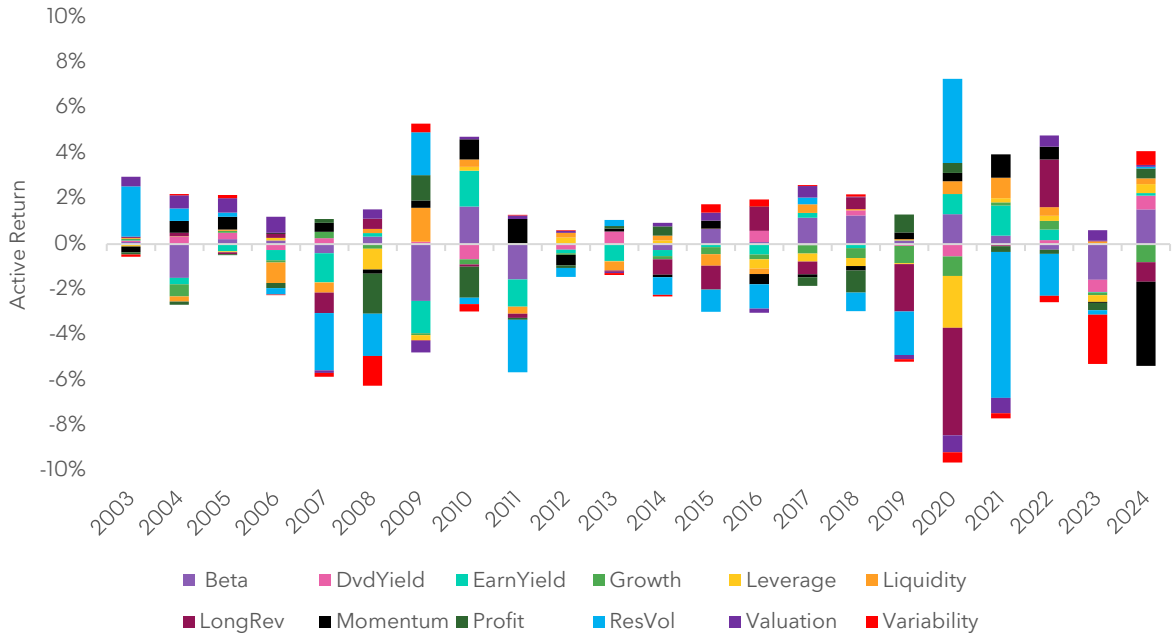
The large style factor contributions, especially in recent years, to the active returns of the BANR index invite a closer examination of its style factor exposures and factor-driven returns, shown in Figures 4 and 5. All MAC3 style factors are included except the two size-related factors as the equal weight scheme mechanically introduces a size bias. Because realized factor returns can be driven by a host of random shocks, the focus of this section is on exposures, which are more meaningful to understanding nature of the ANR Improvers signal.

Figure 4: Style Factor Active Exposures of the Bloomberg ANR Improvers TR Index



Source: Bloomberg. Note: active factor exposures are the sums of the active weights of the Bloomberg ANR Improvers Total Return index multiplied with the individual stock factor exposures. The factor exposures are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

Figure 5: Style Factor Active Returns of the Bloomberg ANR Improvers TR Index



Source: Bloomberg. Note: active factor returns are the sums of the active factor exposures of the Bloomberg ANR Improvers Total Return index multiplied with the individual factor returns. The factor exposures and returns are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

The BANR Index has a very interesting, if not unexpected, set of style factor exposures as shown in Figure 4. On the positive side, the index has a consistent active exposure to valuation, residual volatility, leverage, and liquidity[10]. On the negative side, the index has a consistent active exposure to profitability, growth, and long-term reversal. Finally, its exposures to factors like market beta, momentum, earnings yield, and dividend yield have evolved over time.

On its surface, this factor combination seems like an unfavorable mix. On the positive exposure side, residual vol and high leverage were historically associated with negative expected returns[11]. On the negative exposure side, profitability and growth are usually deemed to be good things. On this basis, one would have naturally expected the BANR index to underperform relative to the benchmark over the past 20 years. But there is a coherent explanation for its outperformance.

The factor footprints of the BANR index are consistent with a strategy that identifies turnaround companies and makes contrarian bets. These are usually companies that either are in recovery after having fallen on hard times or on the upcycle of cyclical sectors. As a result, these companies typically have seen their growth rates slow, near-term profitability diminish, and as cash flow deteriorated, their debt-to-asset or -net sales rise.

Whereas the long-term reversal[12] factor bets on stocks recovering from a long-term decline (trailing five years stock price change), the BANR index identifies short-term cycles, resulting in a negative correlation. As a result, the companies' book equity typically remains sound and they are priced cheaply, even if earnings (hence earnings yield) may have taken a beating.

The BANR index also has a consistent positive exposure to residual (or idiosyncratic) volatility. Individual companies can struggle in the short term for idiosyncratic reasons, as will be shown in the next section. For instance, the chocolate maker Hershey's can struggle because of surging cocoa prices while Netflix can suffer from slowing subscriber growth and the market doubting its ability to crack down on "password sharing".

These positive exposures to residual volatility and the relative concentration of the portfolio likely together contributed to the large, positive, and persistent selection effect as in Figure 3. If the exposure to the turnaround risk factor carries a systematic positive risk premium and the relative concentration of the portfolio does not fully offset the idiosyncratic exposures, this should be the expected resultant factor exposures.

One natural question arises from the above: are analysts simply following stock price momentum or fundamental momentum? Figure 4 shows this is true to a certain extent. ANR improvers indeed load positively the momentum factor, however this does not always happen! The BANR Index has a positive active exposure to the momentum factor with uneven size until 2017, after which it has largely disappeared. Meanwhile, the BANR index

[10] The positive active exposure to liquidity like the size exposures (not shown) is a mechanical result of the minimum $10MM 90-day ADTV liquidity screen during the index construction.
[11] Ang et al 2009 documents that stocks with high past idiosyncratic volatility earn low future average returns. Historically, leverage along with profitability and earnings variability are typically included in definitions of quality factors.
[12] Kelly et al 2021 argues that momentum and long-term reversal factors both earn a positive risk premium because they predict higher future market betas hence systematic risk exposures.

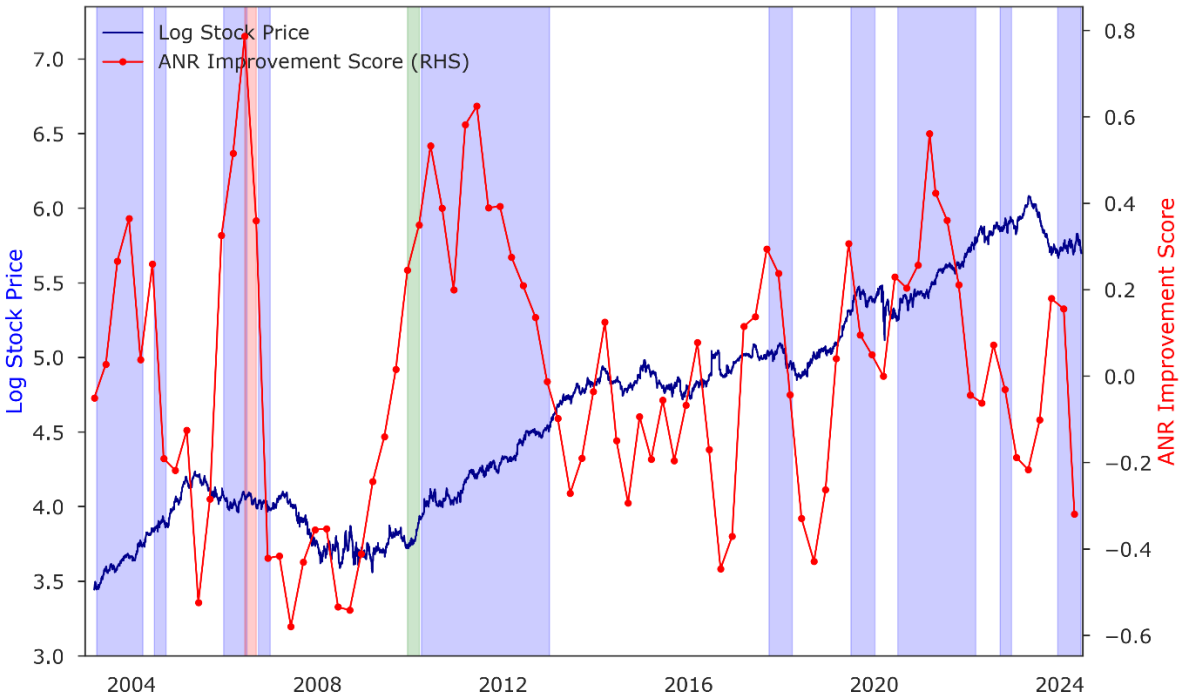
consistently has a *positive* exposure to value and a *negative* exposure to growth[13] that have both grown stronger over time.

How ANR Improvers Signal Works

While the above section has focused on analyzing the ANR improvers through the lens of equity factors, it is may be informative to examine from a bottom-up perspective how the BANR index really selects securities. This is particularly helpful as the index has a relatively high turnover or frequent trading. By looking at concrete examples and trades this section tries to illustrate why and how the ANR improvers signal works.

The two illustrative examples are presented below: Hershey's and Netflix. These two businesses have distinct products, business models and come from contrasting sectors. Hershey's, which was founded in 1894 and went public in 1907, is a century old chocolate maker in the consumer staples sector. Netflix, which was founded in 1997 and went public in 2002, is an internet media company that effectively invented streaming and disrupted how movies and TV shows are made and consumed. Yet they both illustrate how the ANR Improvers signals work.

Figure 6: BANR Index Transactions of Hershey's (HSY US Equity)



Source: Bloomberg. Note: Log Price is the natural log of the gross dividend adjusted stock price (Bloomberg FLDS: RT116). Blue shaded area: the index holds HSY US Equity. Red shaded area: ineligible for selection as ANR score is higher than 4. Green shaded area: ineligible for selection as there are fewer than 10 analysts covering.

Hershey's (HSY US Equity) is a stock that has appeared multiple times in the BANR index since 2003. This should not be surprising for a well-established business with understood business

[13] The growth factor, which in the MAC3 model comprises trailing 1 year revenue growth, trailing 1 year net income growth, and expected short-term and medium-term earnings per share growth, should indeed positively correlate with ANR score momentum, if ANR improvers merely reflect fundamentals momentum or expected growth. Instead, the negative exposure should indicate a degree of surprise.

model operating in a highly cyclical sector. Business will naturally rise and fall due to various macro and micro factors and in tandem analyst ratings. Moreover, Hershey's is not an exciting new business, unlikely to win the raving approvals of analysts hence rendering it more frequently eligible for selection in the BANR index.

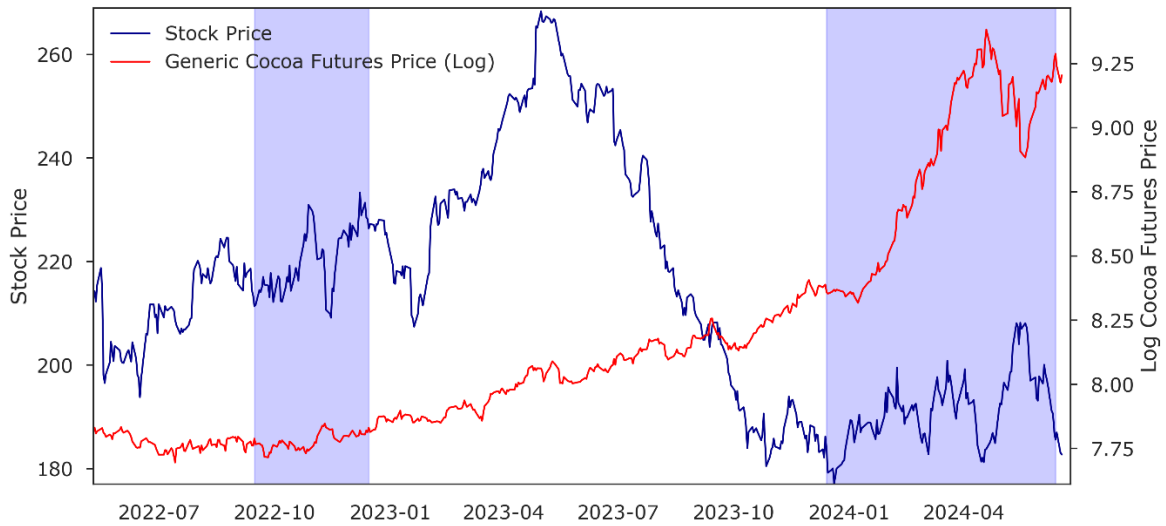
The buy and sell history of HSY in the BANR Index since 2003 is shown in Figure 6 and Table 4. Figure 6 shows how the ANR Improvers signal identifies HSY as buys and sells over time. Whenever the ANR Improvement score shoots up (relative to other eligible securities), the BANR index buys HSY. And as the signal recedes, it is sold. Contrary to casual intuition, this chart shows that the ANR improvement score does not necessarily follow stock price movements. Out of ten completed "trades", seven ended up being profitable and half beat the market. Furthermore, the profitable trades are overall larger than the losses.

Table 4: Bloomberg ANR Improvers Index Transactions of Hershey's (HSY US Equity)

BUY DATE	ANR SCORE	PRICE	SELL DATE	ANR SCORE	PRICE	TOTAL RETURN	BMRK RETURN	PROFIT	OUTPERF
2003/03/31	3.40	19.2	2004/03/29	3.57	25.8	34.76%	33.82%	TRUE	TRUE
2004/06/28	3.77	28.4	2004/09/27	3.43	29.4	3.46%	-2.02%	TRUE	TRUE
2005/12/26	3.63	36.0	2006/06/26	4.16	35.6	-1.35%	-0.48%	FALSE	FALSE
2006/09/25	3.80	33.9	2006/12/25	3.42	32.7	-3.50%	7.16%	FALSE	FALSE
2010/03/29	2.78	31.0	2012/12/31	3.78	55.9	80.40%	29.05%	TRUE	TRUE
2017/09/25	3.29	92.0	2018/03/26	3.19	85.5	-7.07%	7.70%	FALSE	FALSE
2019/07/01	3.11	121.1	2020/01/06	3.00	131.7	8.78%	10.37%	TRUE	FALSE
2020/07/03	3.29	119.6	2022/03/10	3.63	195.7	63.61%	37.64%	TRUE	TRUE
2022/09/15	3.80	211.4	2022/12/15	3.76	226.4	7.11%	-0.29%	TRUE	TRUE
2023/12/14	3.83	183.7	2024/06/13	3.37	185.6	1.04%	15.26%	TRUE	FALSE

Source: Bloomberg.

Figure 7: Hershey's (HSY US Equity) and Cocoa Episode

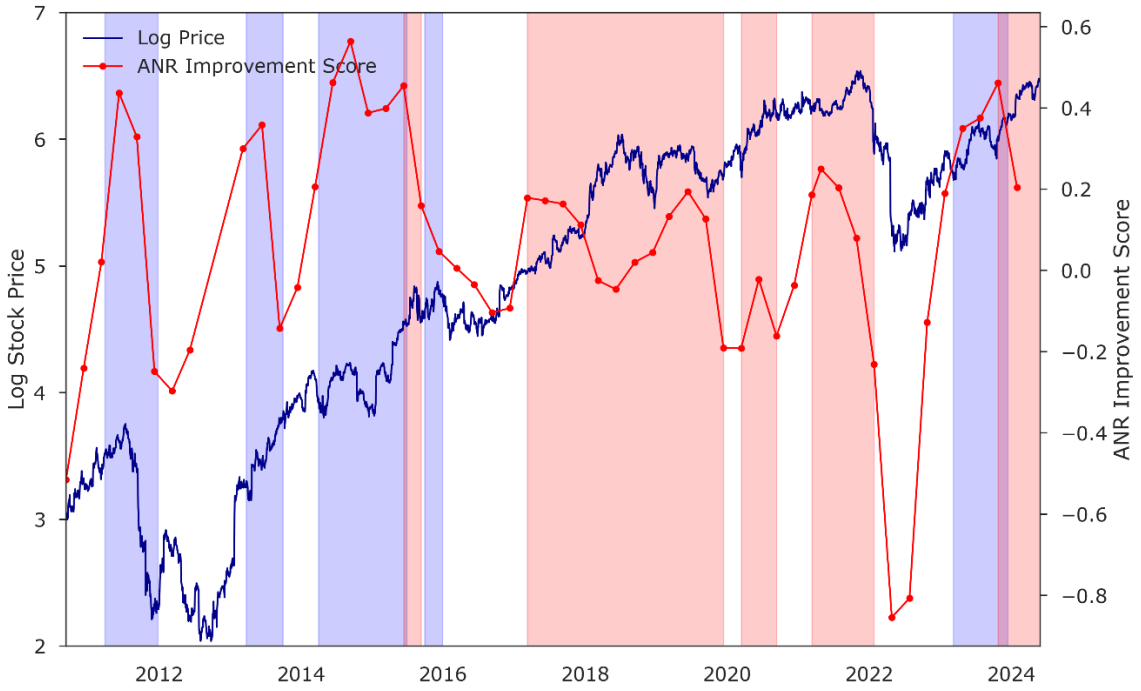


Source: Bloomberg. Note: Blue shaded area: the index holds HSY US Equity.

The most recent trade of Hershey's, which is entered on Dec 14, 2023 and closed out on Jun 13, 2024 rebalance, is worth mentioning. In 2023, adverse climate and crop disease in West

Africa caused the price of cocoa, a main ingredient for chocolate, to skyrocket[14]. In Figure 7, the stock price of HSY is plotted against the log price of cocoa (for legibility). The dramatic rise in cocoa prices clearly hurts Hershey's earnings and share price. However, in Dec 2023, the ANR improvers signal indicates HSY to be a buy, enters the position and holds even as the cocoa price soars even further. In the last few weeks, as the price of cocoa finally started to fall, in the price of HSY started to rise, showing the promise of a profitable trade. Alas, the price of cocoa resumed surging and the trade was closed out for a fortunate modest gain.

Figure 8: BANR Index Transactions of Netflix (NFLX US Equity)



Source: Bloomberg. Note: Log Price is the natural log of the gross dividend adjusted stock price (Bloomberg FLDS: RT116). Blue shaded area: the index holds NFLX US Equity. Red shaded area: ineligible for selection as ANR score is higher than 4.

Table 5: Bloomberg ANR Improvers Index Transactions of Netflix (NFLX US Equity)

BUY DATE	ANR SCORE	PRICE	SELL DATE	ANR SCORE	PRICE	TOTAL RETURN	BMRK RETURN	PROFIT	OUTPERF
2011/03/28	3.07	33.90	2011/12/26	2.85	10.374	-69.40%	-2.04%	FALSE	FALSE
2013/03/25	3.23	25.83	2013/09/30	2.94	44.173	71.03%	9.92%	TRUE	TRUE
2014/03/31	3.26	50.29	2015/06/29	4.05	92.231	83.40%	12.73%	TRUE	TRUE
2015/09/28	3.88	99.47	2015/12/29	3.89	119.12	19.75%	10.65%	TRUE	TRUE
2023/03/09	3.85	297.78	2023/12/14	4.19	469.83	57.78%	22.27%	TRUE	TRUE

Source: Bloomberg.

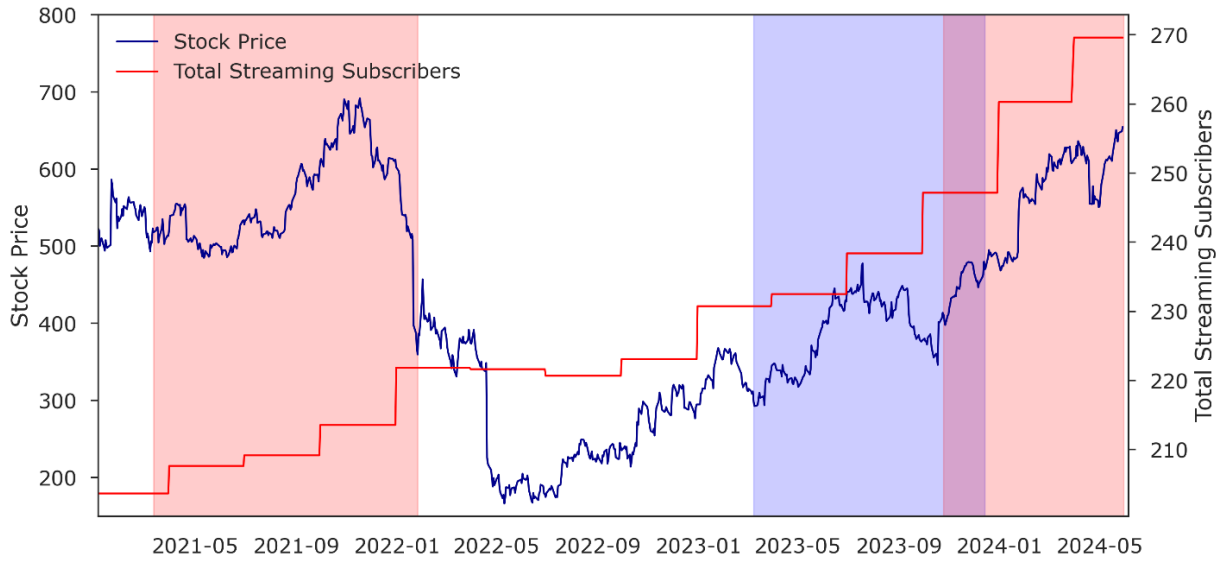
The second example is Netflix. In the past 20 years, NFLX is selected in the BANR index a total of five times, most recently in 2023. As shown in Figure 8, most of the last 10 years during which NFLX is a member of US index, NFLX is not eligible for selection due to its consensus rating being greater than 4, reflecting the company's "darling" status among investors and its membership in the then coveted "FAANG" group.

[14] Climate and crop disease likely only accounted for a portion of the dramatic price action in 2023. Since late 2023, speculative investor activity and hedging by commercial buyers in thin market liquidity likely exacerbated the price rally especially in 2024, when non-commercial investors held some 60% of cocoa futures and options notional exposures according to JPMorgan research.

During the period in which NFLX is eligible for selection, it was in the BANR index for a total of five times, of which four trades were profitable - some even wildly so. However, one trade, in 2011, was terribly unprofitable, down a whopping 69.4% during the period of holding.

The most recent trade in 2023 follows a turbulent 2022 during which Netflix's stock price fell 75% from the Nov 2021 peak due to a small loss of subscribers (contrary to expectations for continued strong growth). The loss of subscribers came because of post-pandemic reversion, increasing competition, cautious consumers, and Netflix's own conservative guidance of weak subscriber growth. This is a distinctly different and idiosyncratic difficulty than the one Hershey's faced in the previous example.

Figure 9: Netflix (NFLX US Equity) and Subscriber Loss Episode



Source: Bloomberg. Note: Blue shaded area: the index holds NFLX US Equity. Red shaded area: ineligible for selection as ANR score is higher than 4.

In this case, Netflix's share price and its ANR improvement score both bottomed around Jun 2022 after which both sharply rebounded. The BANR index picks up NFLX as a buy in Mar 2023 and holds it until Dec 2023, earning a total return of 57.8%. During this period, Netflix announced a plan to grow subscribers by cracking down on "password-sharing" and launching ad-supported accounts, both of which were initially doubted by the market but eventually came to pass. The purpose of recounting these narratives is to highlight the truly idiosyncratic nature of each turnaround story.

The Hit Rates

While the previous section focuses on two specific examples, it has alluded to the "hit rates" or frequencies of profitable trades of the BANR index. How do the hit rates of the BANR index look on a more systematic basis? Moreover, how have the hit rates varied in terms of returns, across time and across sectors? These are the questions that will be tackled in this section.

Table 6: Average Hit Rates

Number of Trades More than	1	2	3	4	5	6	7	8	9	10
Profit Rate	62%	63%	64%	68%	68%	68%	68%	66%	67%	66%
Outperformance Rate	46%	47%	49%	50%	52%	51%	52%	52%	54%	50%
Total Return	6.08%	6.61%	7.74%	9.19%	9.24%	9.38%	9.27%	8.71%	9.20%	8.44%
Excess Return	0.23%	0.17%	1.23%	2.05%	2.35%	2.71%	2.17%	1.69%	1.86%	-0.04%
Avg Holding Period (Days)	199	200	195	196	188	189	192	193	201	191
Number of Trades	507	368	278	207	143	101	68	48	27	13

Source: Bloomberg. Note: each row is the average value across all trades for securities that are traded at least N number of times. Profit rate is the percentage of trades that have a positive total return between buy and sell; outperformance rate is the percentage of trades that have a total return greater than the benchmark UST Index over the same period; excess return is the total return of a trade minus the total return of the benchmark index over the same period.

As shown in Table 6, the BANR index has realized a high hit rate since 2003. To present a full view of the hit rates and average returns, the results are tabulated based on a cumulative distribution basis as the minimum number of trades. For example, securities that traded at least four times, representing approximately 40% of all transactions, had a positive return in 68% of the trades or a hit rate about two out of threes, and beat the benchmark index contemporaneously 52% of the time. An average trade has a holding period of 196 calendar days. Looking across the different minimum number of trades, these statistics seem reassuringly stable.

Table 7: Hit Rates by Sector

SECTOR_NAME	Profit Rate	Outperformance Rate	Avg Return	Excess Return	Holding Period	Number of Trades
Communications	55%	51%	5.46%	0.86%	282	84
Consumer Discretionary	64%	52%	7.77%	2.53%	201	267
Consumer Staples	65%	38%	5.26%	-3.64%	222	229
Energy	68%	57%	9.24%	3.73%	158	129
Health Care	66%	44%	7.45%	0.52%	196	196
Industrials	66%	55%	9.03%	2.52%	188	258
Materials	60%	44%	7.61%	2.35%	167	124
Real Estate	58%	42%	2.35%	-0.37%	176	12
Technology	61%	49%	7.50%	1.45%	193	310
Utilities	72%	48%	8.00%	-0.32%	208	162

Source: Bloomberg. Note: each row is the average value across all trades for securities within a given BICS1 sector.

Across sectors, the hit rates of the BANR index trades are much more varied as shown in Table 7. The percentages of profitable trades seem noticeably higher in certain sectors, such as utilities, energy, industrials, and healthcare, than in sectors like technology, materials, or communications. There is also positive correlation, albeit weak, between hit rates and average returns across sectors. However, there does not seem to be a consistent pattern across average lengths of holding periods or number of trades across sectors.

Finally, the hit rates have also fluctuated greatly from year to year as shown in Table 8, where some years have a hit rate as high as 83% and some as low as 40%. In this case, each trade is assigned a year based on its buy date regardless of length of holding. However, alternative specifications have yielded similar results. Naturally, there is a positive correlation between average hit rates and the average return, but it is not a strong one. This points to the highly dynamic, regime-dependent, and sometimes persistent nature of the ANR improvers or the turnaround factor. While the strategy has yielded strong historical returns, it certainly goes through periods of weaker patches as the amount of turnaround opportunities varies!

Table 8: Hit Rates Over Time

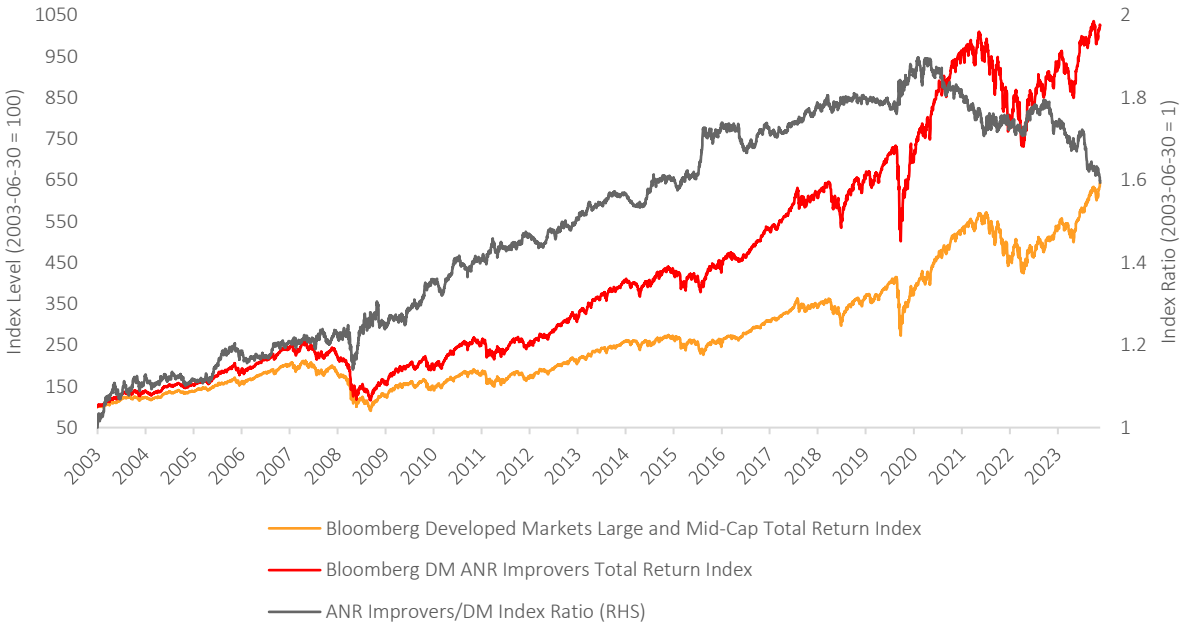
YEAR	Profit Rate	Outperformance Rate	Average Total Return	Average Excess Return	Number of Trades
2003	77.08%	46.88%	14.98%	1.24%	96
2005	66.67%	45.98%	8.24%	2.78%	87
2007	40.00%	49.41%	-4.67%	1.13%	85
2009	83.33%	54.44%	19.11%	4.59%	90
2011	62.64%	42.86%	4.64%	-2.53%	91
2013	81.48%	55.56%	19.16%	5.90%	81
2015	60.23%	54.55%	3.96%	2.05%	88
2017	67.82%	50.57%	6.81%	-0.01%	87
2019	54.10%	36.07%	2.45%	-2.90%	61
2021	47.00%	37.00%	1.61%	-1.18%	100
2023	62.30%	29.51%	5.20%	-7.08%	61

Source: Bloomberg. Note: alternate years displayed for brevity. A trade is assigned a particular year based on the year of the buy date regardless of time of sell date.

ANR Improvers Across the World

Given the discussion about the international differences of ANR scores across countries and the detailed dive into the BANR index in the US, a natural question arises: does the ANR Improvers work similarly outside the US? The short answer is yes! ANR improvers works remarkably consistently across the globe, so long as there is good analyst coverage. For the sake of space, this section will present an example using the Bloomberg Developed Markets Large and Mid-Cap index (DM index) as the selection universe.

Figure 9: Performance of Bloomberg ANR Improvers Index in DM.



Source: Bloomberg, Jun 30, 2003 - May 17, 2024. Note: "index ratio" is the quotient of ANR Improvers index over the DMTR index with both indices normalized to 100 on Jun 30, 2003.

Table 9: Summary Statistics of Bloomberg ANR Improvers Index (DM)

	Bloomberg Developed Markets Large and Mid-Cap Total Return Index	Bloomberg DM ANR Improvers Total Return Index
Time Period	2003-06-30 - 2024-05-17	2003-06-30 - 2024-05-17
Cumulative Return	542.65%	924.46%
Annualized Return	8.94%	11.31%
Volatility	15.87%	15.29%
Downside Volatility	13.06%	12.15%
Sharpe Ratio	0.56	0.74
Dividend Yield	1.80%	1.83%
Max Drawdown	-57.40%	-55.15%
Annualized Excess Return		2.08%
Annualized Tracking Error		4.86%
Information Ratio		0.43
Up Capture Ratio		0.96
Down Capture Ratio		0.93
Correlation		0.95
Beta		0.92
Alpha		2.87%

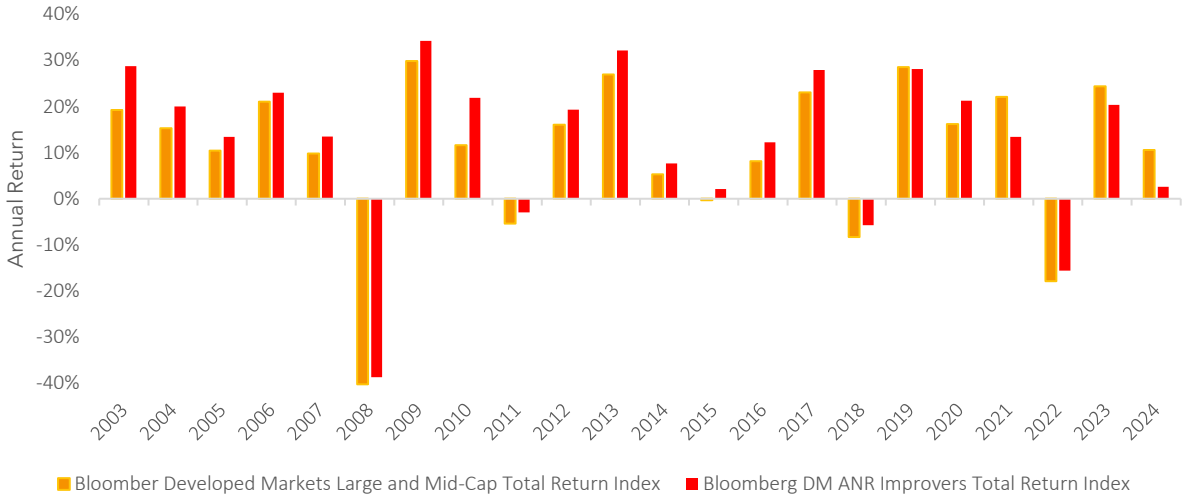
Source: Bloomberg

Given the drastic global differences in liquidity, sector weights, and ANR score coverage, the ANR improvers index for DM is constructed with a slightly different methodology. A less conservative liquidity screen (minimum $2MM 90-day ADTV and $500MM market cap) is applied. In terms of selection rule, the top third of each (BICS level 1) sector by the highest ANR improvement score (defined as above) are selected. These are further filtered down to the top 100 securities by market cap. As with the BANR index, an equal weighting scheme is applied and reconstituted and rebalanced on the same quarterly calendar. The sector and country weight distributions are shown in the appendix.

As shown in Figure 9 and Table 9, an ANR Improvers total return index for DM ("BANRDMTR index") constructed as described above has significantly outperformed the underlying benchmark universe, which is the Bloomberg DM Large and Mid-Cap Total Return Index (DMTR index) since Jun 2003. If anything, the outperformance is a little more impressive than the US returns, given the relatively weak performance of the global markets in recent years. The BANRDM index realized a higher risk-adjusted return in terms of a higher Sharpe ratio, slightly lower volatility, and maximum drawdown compared to the benchmark.

A similar message about the performance of the BANRDM index can also be gleaned from Figures 9 and 10. In Figure 9, an index ratio of BANRDMTR index over the DMTR index is plotted alongside the levels of the indices. This rises nearly linearly from 2003 until 2020. Since 2020, like the BANR index in the US it starts to struggle against a roaring benchmark. Figure 10, which plots the yearly returns of the DMTR index and the BANRDMTR index, similarly shows consistent outperformance of the ANR improvers index until 2020, after which it only outperforms in 2022 by realizing a smaller drawdown.

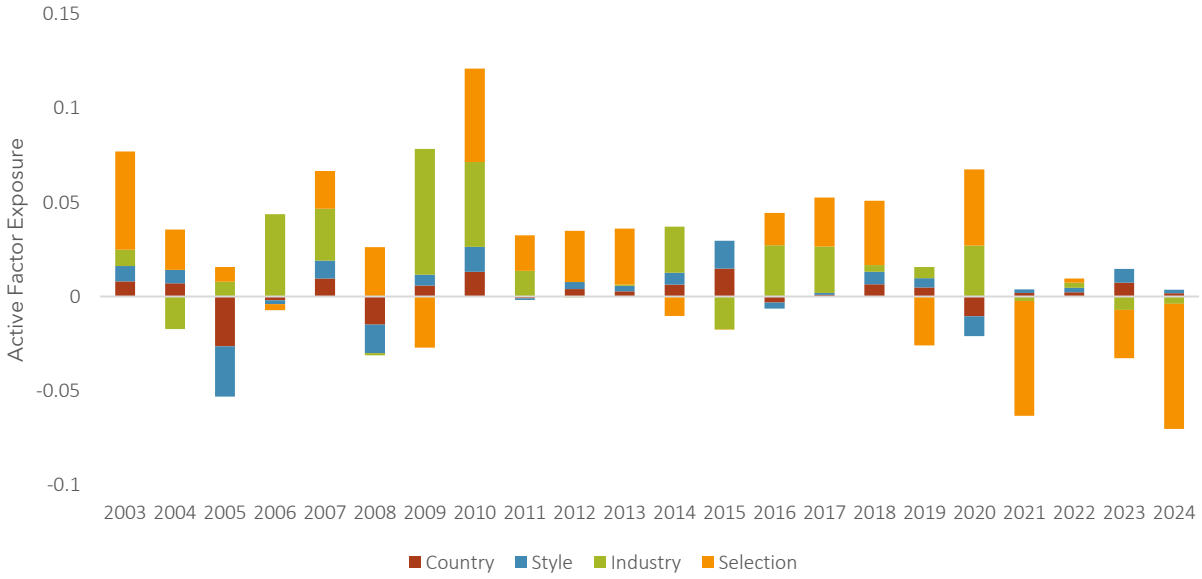
Figure 10: Annual Returns of Bloomberg ANR Improvers (DM) Index



Source: Bloomberg

Finally, it is worth highlighting that like the BANR index, albeit to a slightly lesser extent, the BANRDM index has seen a large, positive, and persistent selection effect contributing to its excess returns over the benchmark index. As shown in Figure 11, in the 20 years between 2003 and 2022, only five years saw a negative selection effect contribution, once again indicating the orthogonality of the ANR improvers signal.

Figure 11: Factor-based Active Return Attribution of the Bloomberg DM ANR Improvers TR Index



Source: Bloomberg. Note: active returns are the differences between the annual returns of the Bloomberg ANR Improvers Total Return index and the annual returns of the Bloomberg DM Large & Mid-Cap Total Return Index.

Conclusion

Despite being one of the most watched metrics for individual stocks, the value of analyst ratings remains often misunderstood. Investors follow analyst opinions closely, but also remain skeptical, often rightly so. It turns out analysts usually are not wrong, but they often can be late. This article provides an overview of analyst ratings for the cross-section of stocks across multiple markets over the long run. It proposes and examines an alternative way to utilize analyst ratings as a systematic signal that takes advantage of the information contained in the ratings. By focusing on unloved stocks that have seen the biggest improvements in the past 6 to 12 months, investors can systematically identify a set of companies, whose bad fortunes may be turning. This strategy has historically realized strong returns and are highly orthogonal to common factor exposures. It presents a valuable addition to investor's overall equity investment allocation.

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Appendix

A. ANR Scores Across Global Markets

Table A1: Summary Statistics of Bloomberg ANR Consensus Scores in Emerging Markets

Year	Bloomberg Emerging Markets Large and Mid-Cap			
	ANR Median	ANR StDev	ANR Improv Median	ANR Improv StDev
2003	3.77	0.85	-0.15	0.65
2005	3.89	0.84	-0.06	0.63
2007	4.05	0.74	0.04	0.63
2009	3.71	0.83	-0.17	0.66
2011	4.07	0.75	0.01	0.53
2013	3.87	0.78	-0.04	0.47
2015	3.88	0.77	0.01	0.47
2017	3.91	0.76	0.01	0.46
2019	4.20	0.74	-0.02	0.44
2021	4.49	0.69	0.05	0.42
2023	4.44	0.69	-0.01	0.38
Average	4.02	0.77	-0.03	0.52

Sector Name	ANR Median	ANR StDev	ANR Improv Median	ANR Improv StDev
Communications	3.97	0.76	0.00	0.44
Consumer Discretionary	4.15	0.66	0.00	0.42
Consumer Staples	3.82	0.77	0.00	0.49
Energy	4.00	0.80	0.00	0.50
Financials	4.00	0.78	0.00	0.47
Health Care	4.12	0.65	0.00	0.44
Industrials	4.00	0.74	0.00	0.48
Materials	4.00	0.81	0.00	0.55
Real Estate	4.20	0.69	0.00	0.42
Technology	3.95	0.70	0.00	0.50
Utilities	4.00	0.75	0.00	0.50

Discussion: ANR consensus scores in the EM are more similar as the US both over time and across sectors. While starting at a level similar as the US, the median ANR consensus rating has increased steadily especially in the last decade, eclipsing even the US. It seems that analysts in Emerging Markets have come to exhibit even an even greater "bullish bias"[15]. In addition, EM consensus analyst ratings have a greater standard deviation or great dispersion of rating in the cross-section.

[15] An alternative interpretation that has been highlighted to the author is that in certain East Asian countries such as South Korea or China, analysts are under career pressures to rate the companies they cover positively as buys, or risk being "blacklisted". Other markets such as Taiwan the investor relations teams are more "Western" in their approach.

Table A2: Summary Statistics of Bloomberg ANR Consensus Scores in Europe Developed Markets and Emerging Markets: Across Countries

Country Name	ANR Median	ANR StDev	ANR Improv Median	ANR Improv StDev
United States	3.95	0.56	-0.02	0.32
Top Europe Developed Markets Countries				
EDM Average	3.68	0.61	-0.02	0.39
France	3.80	0.54	0.01	0.33
Netherlands	3.77	0.49	0.00	0.35
Germany	3.73	0.57	0.02	0.37
United Kingdom	3.67	0.57	0.00	0.35
Italy	3.66	0.61	0.02	0.43
Switzerland	3.66	0.53	-0.01	0.33
Spain	3.45	0.74	0.02	0.38
Sweden	3.40	0.61	0.01	0.41
Top Emerging Markets Countries				
EM Average	4.02	0.77	-0.03	0.52
South Korea	4.57	0.47	0.00	0.31
Brazil	4.11	0.64	-0.01	0.42
China	4.10	0.64	0.00	0.43
Thailand	4.04	0.69	0.06	0.49
India	3.94	0.74	0.00	0.43
Taiwan	3.73	0.72	0.00	0.53
Malaysia	3.67	0.71	-0.04	0.52
South Africa	3.50	0.75	0.00	0.56

Discussion: ANR scores vary significantly across geographical regions and across countries with a given regional market. Statistics of ANR scores for major countries in Europe developed markets (EDM) and Emerging Markets are presented. Each statistic is also presented at the aggregate US, EDM, and EM for easier comparison. At the top level, it is very clear that ANR consensus ratings are highest in the EM, followed by the US, while Europe is the most conservative. Within EDM and EM, there appears to be a great deal of variations in the median consensus ANR scores, especially within the EM, likely reflecting differences in corporate culture, economic and institutional differences. It is reassuring that 1) ANR Improver median scores hug tightly around zero across countries; 2) standard deviations of ANR consensus scores and improver scores are similar across countries.

B. ANR Leaders vs ANR Improvers

This section compares the ANR Improvers strategy with the ANR Leaders strategy, which are the stocks with the highest ANR consensus scores. Should investors buy the highest rated stocks? The main text of the article asserts that "analysts may often be right but late", which has been shown in academic finance articles. A simple demonstration would be to contrast the performances of strategies based on the levels and the changes of the ANR scores with similar construction.

The ANR Leader index is built along a similar methodology as ANR Improvers (details in the main text). Starting with the Bloomberg US Large & Mid-Cap Index, among securities with at least 11 analysts covering, the index selects 50 securities with the highest consensus ANR ratings. Upon selection, index members are weighted two different ways for a full comparison: 1) market capitalization weight with an individual security weight maximum cap of 7.5% and a sector weight maximum cap of 35%; 2) equal weighted.

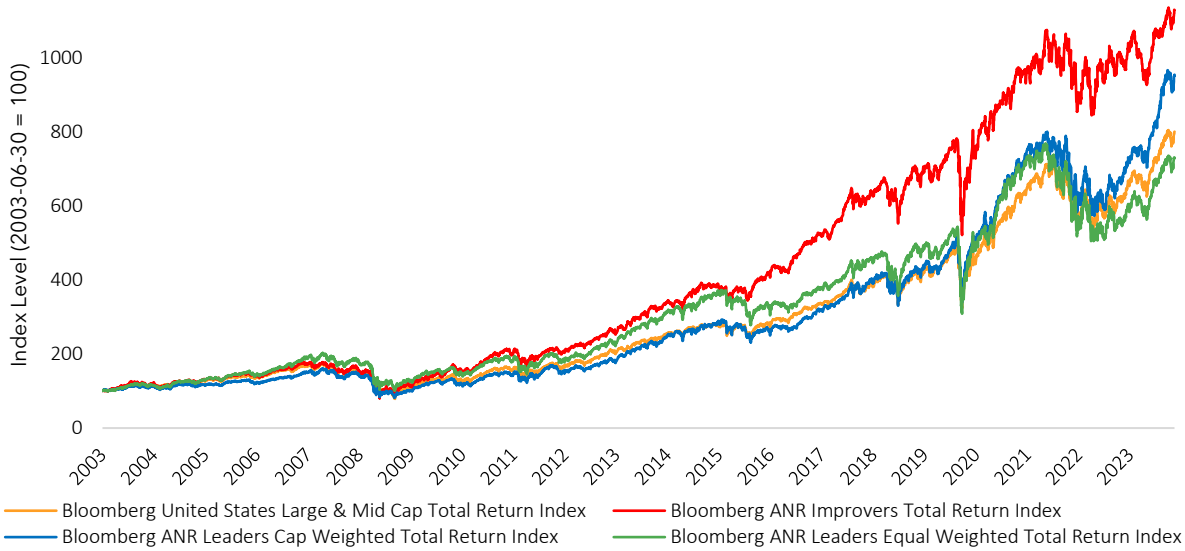
Table B1: Average Analyst Rating Consensus Scores for ANR Leaders Index and ANR Improvers Index

Mean ANR Consensus Score	2003	2005	2007	2009	2011	2013	2015	2017	2019	2021	2023
ANR Leaders	4.51	4.53	4.60	4.63	4.69	4.68	4.71	4.73	4.76	4.80	4.76
ANR Improvers	3.53	3.56	3.54	3.64	3.63	3.60	3.62	3.54	3.57	3.56	3.49

Source: Bloomberg.

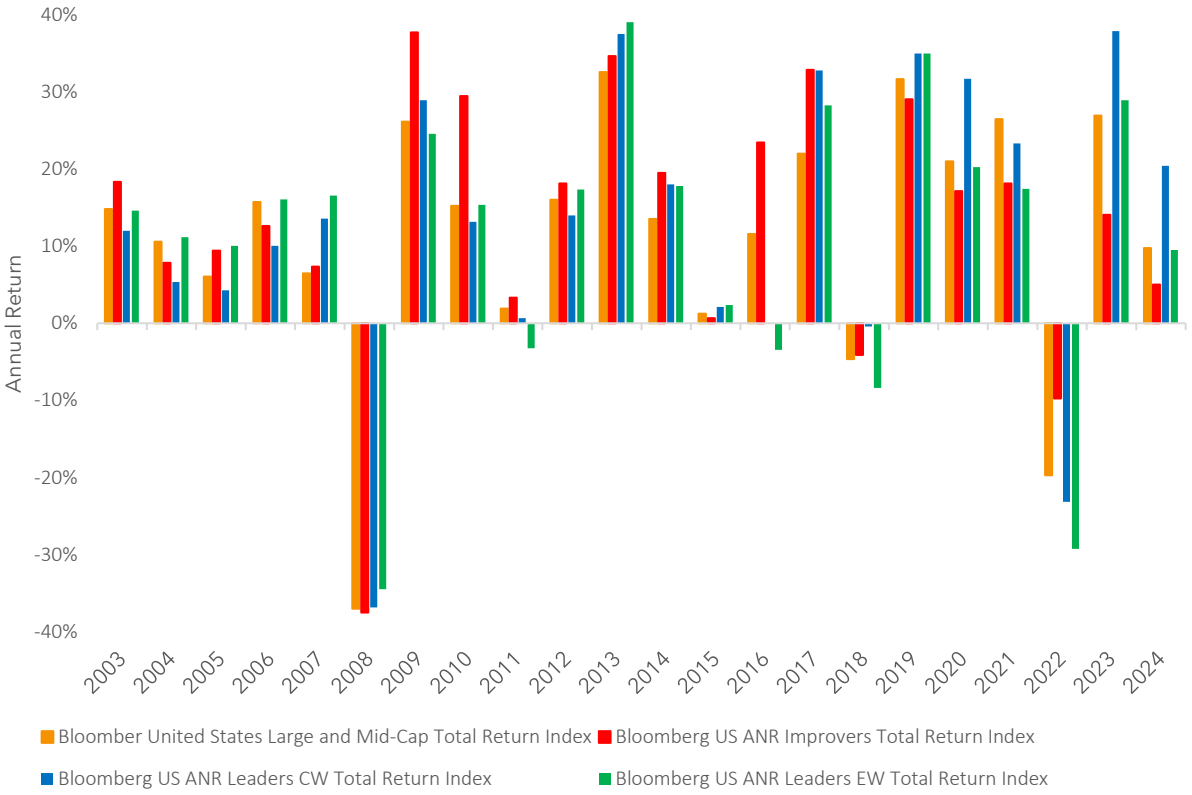
The ANR Leaders Indexes and the ANR Improvers Index have had contrasting performances. As seen in Table B1, the ANR Leaders index members by construction have much higher ANR scores with an average around 4.5 (Buy or Strong Buy) over the past 20 years. These are stocks most beloved by analysts. the ANR Improvers index has an average rating hovering around 3.5 (Hold or worse). Nevertheless, the ANR Improvers index has significantly outperformed both versions of the ANR Leaders Index. Until Mar 2020 ("COVID Crash"), ANR Leaders Index, esp. the CW version, has performed close to the benchmark while ANR Improvers index steadily and significantly outperformed. Since Mar 2020, ANR Leaders CW has staged an eyewatering rally reflecting the strong performance of the most beloved large cap (tech) stocks.

Figure B1: ANR Leaders vs ANR Improvers Performance Comparison



Source: Bloomberg.

Figure B2: ANR Leaders and ANR Improvers Indices Annual Returns



Source: Bloomberg.

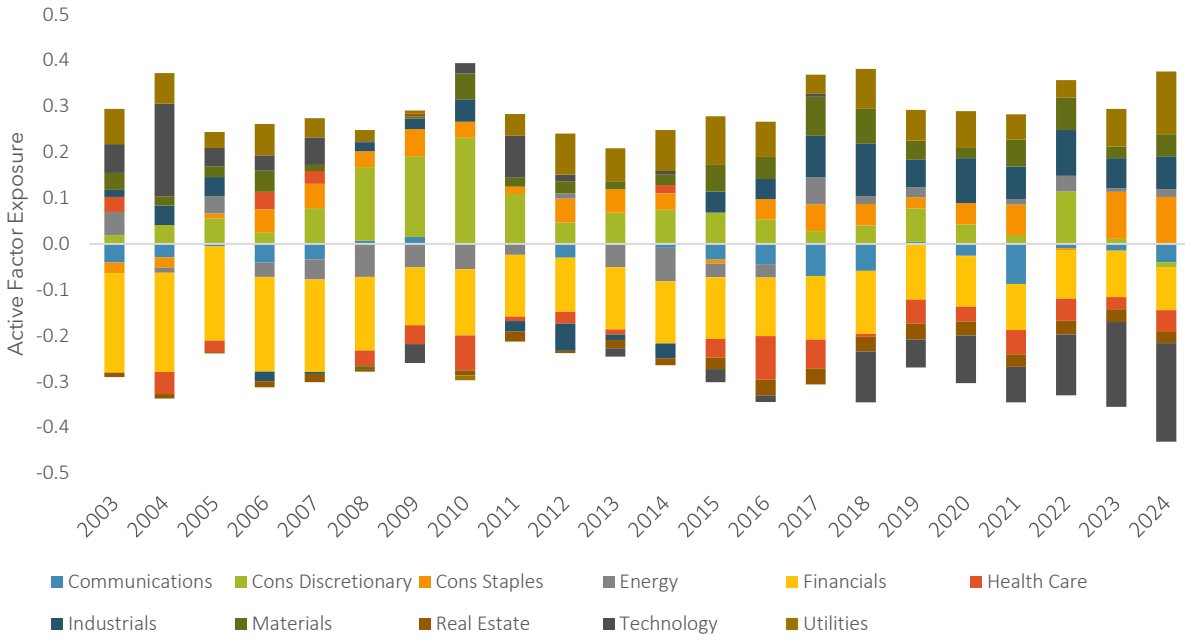
Table B2: Performance Summary Statistics

	Bloomberg US Large and Mid-Cap	Bloomberg Analyst Rating Improvers Index	Bloomberg US ANR Leaders CW Total Return Index	Bloomberg US ANR Leaders EW Total Return Index
Time Period	2003-06-30 - 2024-05-10	2003-06-30 - 2024-05-10	2003-06-30 - 2024-06-11	2003-06-30 - 2024-06-11
Cumulative Return	700.03%	1028.53%	895.19%	633.68%
Annualized Return	10.42%	12.25%	11.60%	9.99%
Volatility	18.86%	19.59%	20.03%	21.34%
Downside Volatility	15.36%	15.53%	15.87%	17.22%
Sharpe Ratio	0.55	0.63	0.58	0.47
Dividend Yield	1.61%	1.68%	1.12%	1.00%
Max Drawdown	-54.86%	-55.10%	-49.05%	-50.04%
Annualized Excess Return		1.80%	1.14%	-0.04%
Annualized Tracking Error		6.14%	5.83%	6.79%
Information Ratio		0.29	0.20	-0.01
Up Capture Ratio		1.01	1.04	1.09
Down Capture Ratio		0.99	1.04	1.10
Correlation		94.98%	95.69%	95.02%
Beta		0.99	1.01	1.07
Alpha		1.94%	0.96%	-0.91%

Source: Bloomberg.

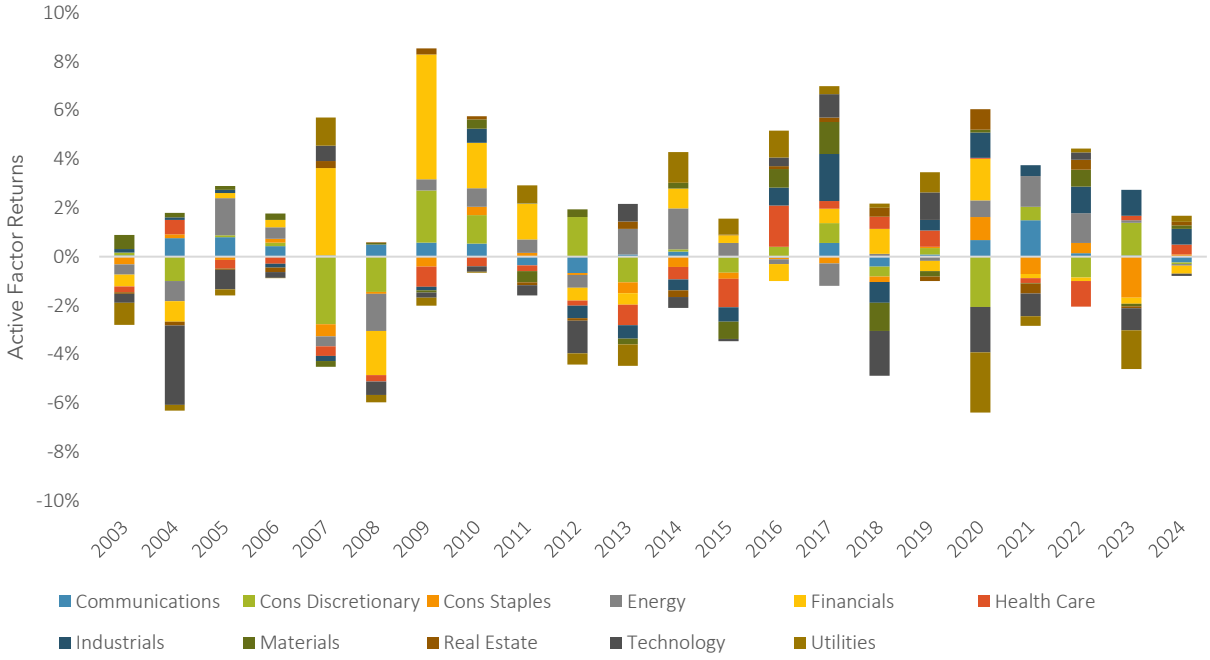
C. Additional US Factor Attributions

Figure C1: Industry Factor Active Exposures of the Bloomberg ANR Improvers (US) TR Index



Source: Bloomberg. Note: active factor exposures are the sums of the active weights of the Bloomberg ANR Improvers Total Return index multiplied with the individual stock factor exposures. The factor exposures are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

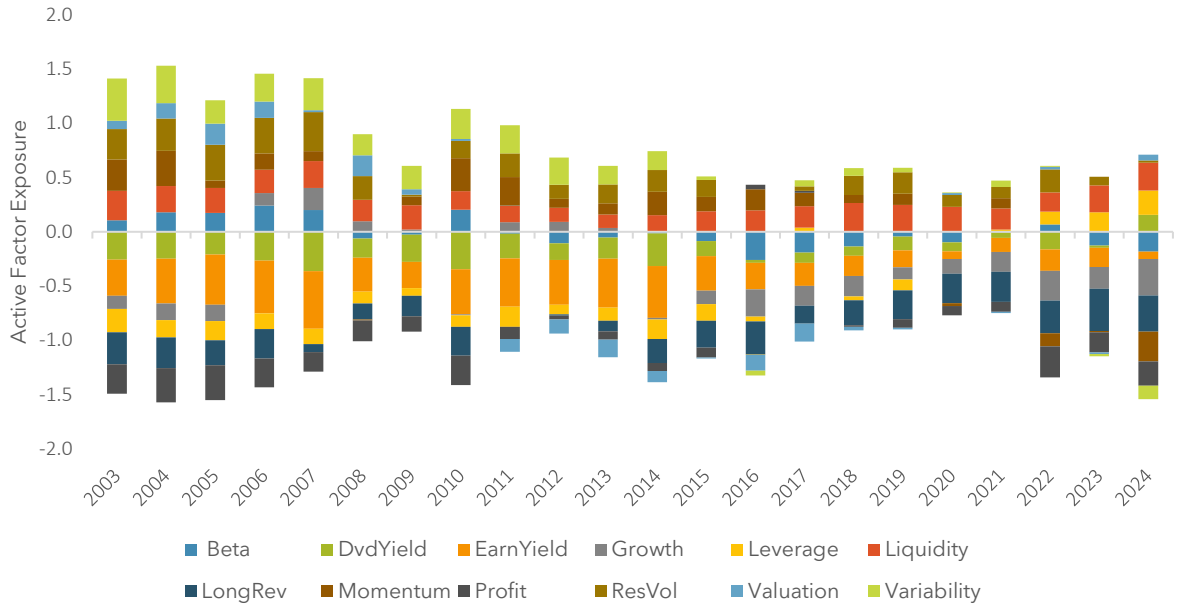
Figure C2: Industry Factor Active Returns of the Bloomberg ANR Improvers (US) TR Index



Source: Bloomberg. Note: active factor returns are the sums of the active factor exposures of the Bloomberg ANR Improvers Total Return index multiplied with the individual factor returns. The factor exposures and returns are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

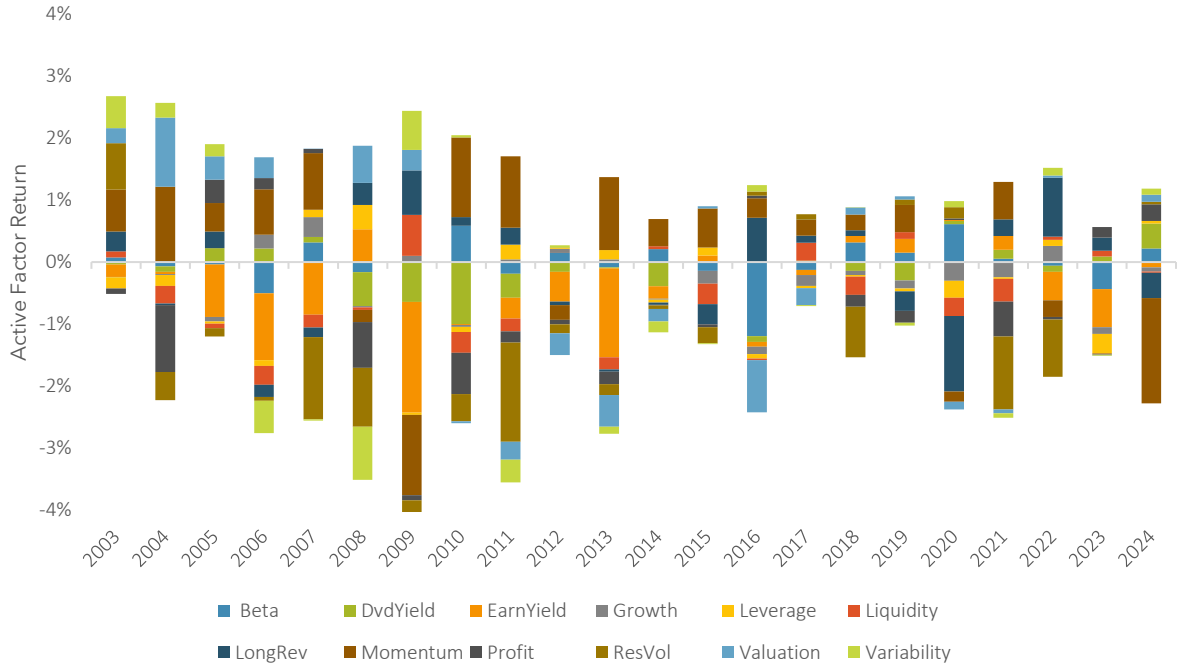
D. Additional DM Factor Attributions

Figure D1: Style Factor Active Exposures of the Bloomberg ANR Improvers (DM) TR Index



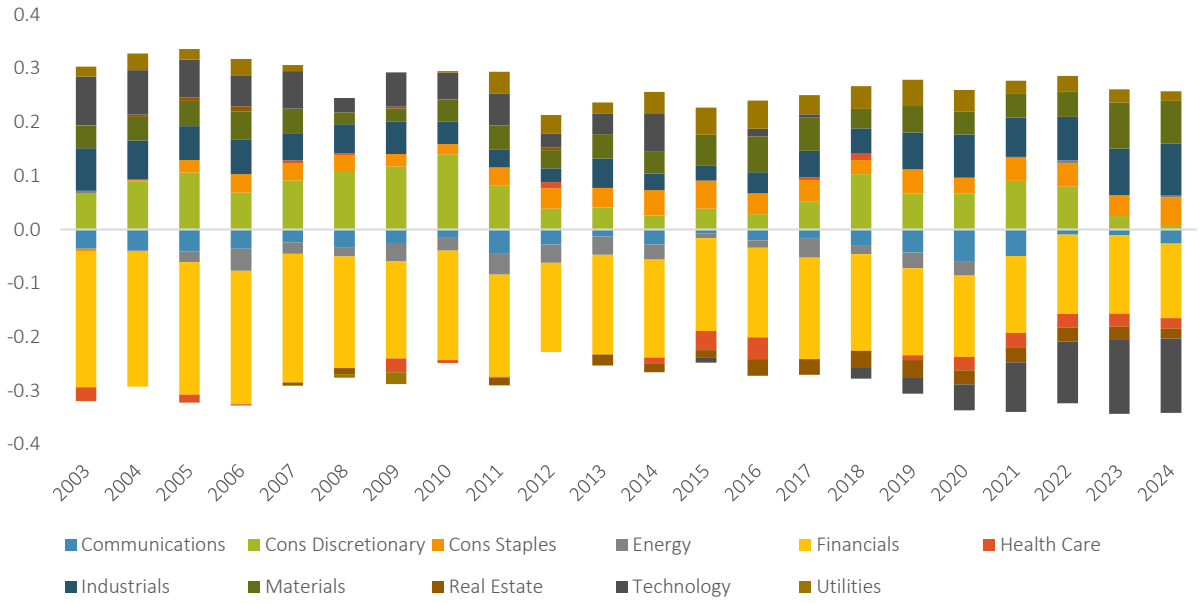
Source: Bloomberg. Note: active factor exposures are the sums of the active weights of the Bloomberg ANR Improvers Total Return index multiplied with the individual stock factor exposures. The factor exposures are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

Figure D2: Style Factor Active Returns of the Bloomberg ANR Improvers (DM) TR Index



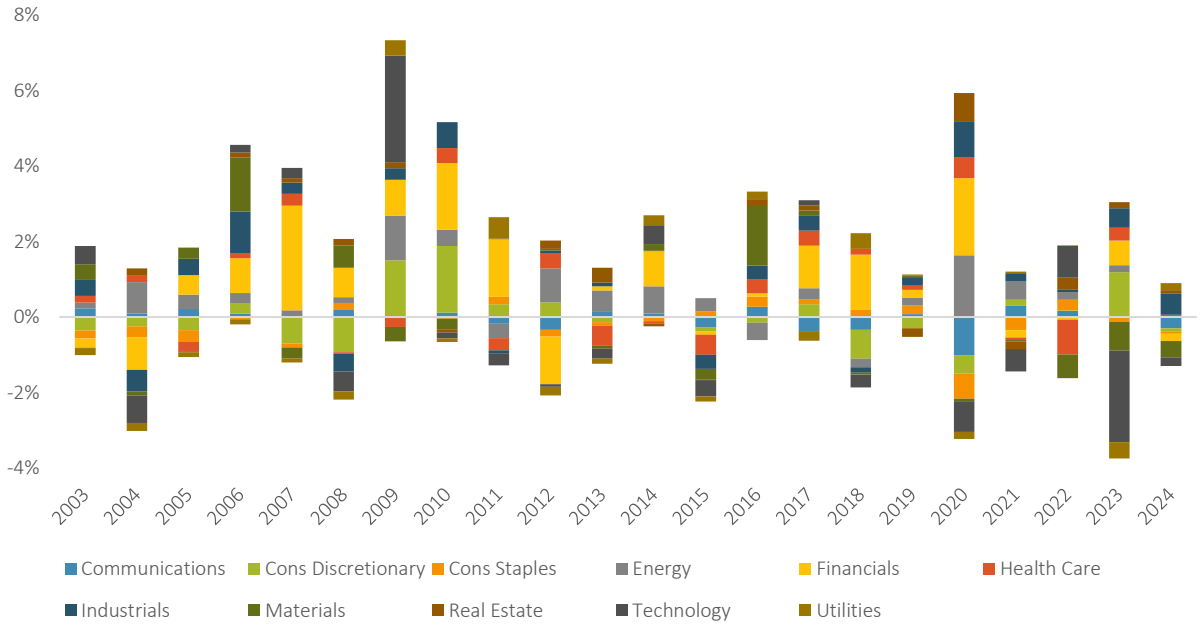
Source: Bloomberg. Note: active factor returns are the sums of the active factor exposures of the Bloomberg ANR Improvers Total Return index multiplied with the individual factor returns. The factor exposures and returns are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

Figure D3: Industry Factor Active Exposures of the Bloomberg ANR Improvers (DM) TR Index



Source: Bloomberg. Note: active factor exposures are the sums of the active weights of the Bloomberg ANR Improvers Total Return index multiplied with the individual stock factor exposures. The factor exposures are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

Figure D4: Industry Factor Active Returns of the Bloomberg ANR Improvers (DM) TR Index



Source: Bloomberg. Note: active factor returns are the sums of the active factor exposures of the Bloomberg ANR Improvers Total Return index multiplied with the individual factor returns. The factor exposures and returns are obtained from the Bloomberg's 3rd generation Multi-Asset Class model (MAC3).

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