Causeway Convergence Series:
Value and Earnings Estimates Revisions – A Powerful Pairing

Causeway's dual research perspective combines insights from fundamental and quantitative research, and is the defining feature of our investment philosophy. For nearly 25 years, we have been integrating these complementary investment approaches in a process we call "convergence." This paper is the first in a series, highlighting how new areas of convergence have empowered our portfolio managers to address the challenges of value investing in today's markets.[1]

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The core of value investing involves buying unpopular stocks. But what prevents an unpopular stock from becoming even more unpopular? One of the major pitfalls of a value strategy is buying too early, trying to "catch a falling knife." A stock trading at a single-digit price-to-earnings ratio may seem attractive, but it may not look as cheap if earnings suddenly plummet. Tracking the direction of earnings estimates can improve the successful timing of entry and exit points. In our experience, earnings estimates revisions complement a value-based strategy. Sell-side analysts frequently change their estimates for many reasons such as to reflect an upcoming change in the business cycle, adjust expectations for industry-wide data, or incorporate actual earnings results and management guidance. Earnings estimates revisions tend to be highly correlated with future earnings revisions, which are highly correlated with future stock price moves.

[1] Causeway was founded in 2001. Causeway's founding members began integrating fundamental and quantitative research at their prior firm in 1994. See endnotes of this paper for important definitions.

Value and Earnings Estimates Revisions – A Powerful Pairing

In many cases, we can use earnings revisions to fine tune the trading aspect of our fundamental value strategies, slowing the buying of stocks with earnings headwinds and delaying the sale of those enjoying upward earnings revisions.

To improve the timing of buys and sells, we study the relationship between earnings revisions and stock price for clues on how to avoid the classic value manager mistake of buying too early (before the share price has reached a floor) and selling too early (forfeiting future alpha). In many cases, we can use earnings revisions to fine tune the trading aspect of our fundamental value strategies, slowing the buying of stocks with earnings headwinds and delaying the sale of those enjoying upward earnings revisions. We have found that extremely cheap stocks, however, sometimes warrant buying even as earnings continue to deteriorate, assuming the underlying company has superior financial strength. The converse generally also holds true: if we believe a stock's valuation is likely to de-rate further, and earning revisions remain negative, then we have a signal that patiently waiting is likely to be rewarded with a more attractive entry price.

There are a variety of ways to quantify earnings estimates revisions. One approach is to measure "diffusion" of estimate changes, the ratio of upgrades to downgrades for different income statement items over a period of time. Another approach involves ranking analysts based on their historical efficacy, and upweighting those analysts who have the best results when comparing estimated earnings to actual earnings. Comparing this weighted average to the consensus average may indicate if the company will beat or miss the earnings estimates forecast by analysts. Quantitative analytics firm, Starmine, provides this data as part of its Analyst Revisions Model (ARM) scores. For purposes of this paper, we have constructed a simple measure of earnings revisions which consists of 50% earnings-per-share (EPS) estimate diffusion and

50% Starmine ARM score. Across all stocks in the MSCI World and Emerging Markets Indices, we compare these composite earnings estimates revisions scores to value scores in Exhibit 1.

Exhibit 1 illustrates a consistently negative correlation between earnings estimates revisions and value characteristics. Unsurprisingly, value stocks tend to have earnings estimates that are declining. This may be why they appear "cheap." However, holding aside this typical relationship, let's observe the historical returns of value-based and earnings-revisions-based strategies independently. To test the efficacy of an easily-replicable value strategy, assume we go long the 20% cheapest stocks and short the 20% most expensive stocks in the MSCI

Value and Earnings Estimates Revisions characteristics tend to be inversely correlated

EXHIBIT 1. CROSS-SECTIONAL RANK CORRELATION BETWEEN VALUE AND EARNINGS ESTIMATES REVISIONS
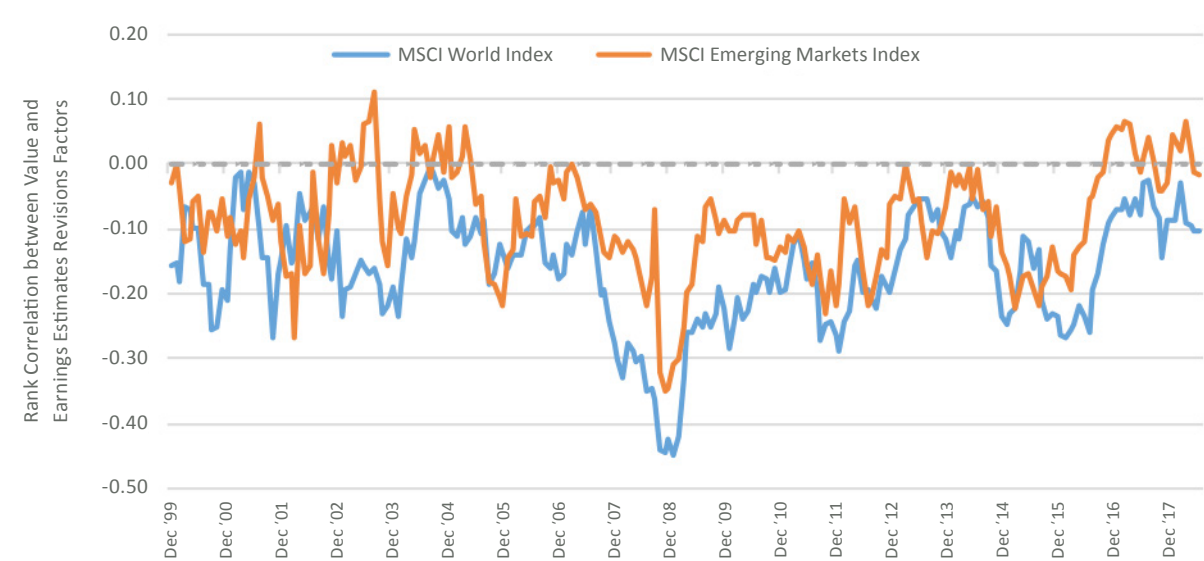
Note: Rank (Spearman) correlations between Value factors and Earnings Estimates Revisions factors within MSCI World Index and MSCI Emerging Markets Index from December 1999 to July 2018. Value factors consist of Forward Earnings to Price, Earnings to Price, Book to Price, Dividend Yield, and Cash Earnings to Price ratios. Earnings estimates revisions factors consist of Starmine Analyst Revisions Model (ARM) score and 3-month diffusion in forward earnings-per-share (EPS) estimates. Source: Causeway Analytics, MSCI, Starmine, FactSet

World and Emerging Market Indices, rebalancing monthly. To test earnings revisions, let's assume we go long the 20% of stocks with the most positive earnings revisions over the past three months while shorting the 20% of stocks with the most negative revisions. The rolling 12-month returns to these strategies are shown in Exhibit 2 for both developed and emerging markets.

Returns to Value and Earnings Estimates Revisions are inversely correlated in DM and EM

EXHIBIT 2A. ROLLING 12-MONTH PERFORMANCE OF VALUE AND EARNINGS ESTIMATES REVISIONS WITHIN MSCI WORLD INDEX
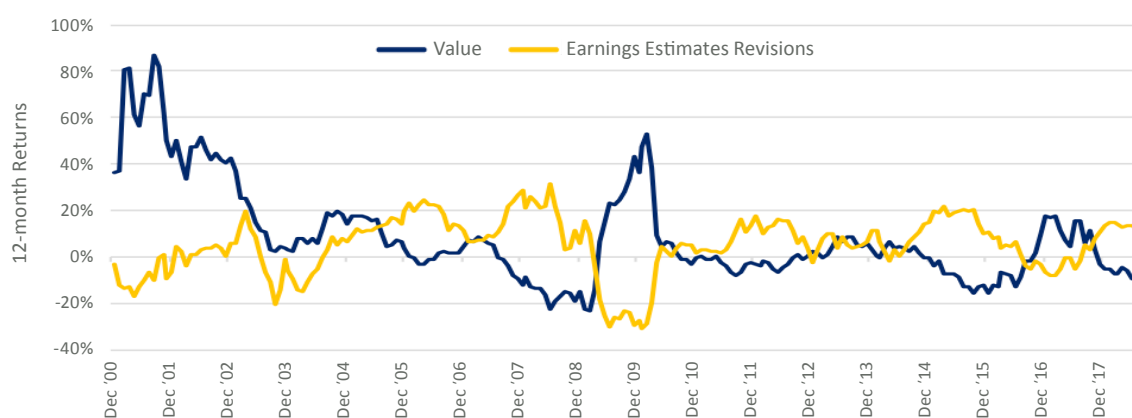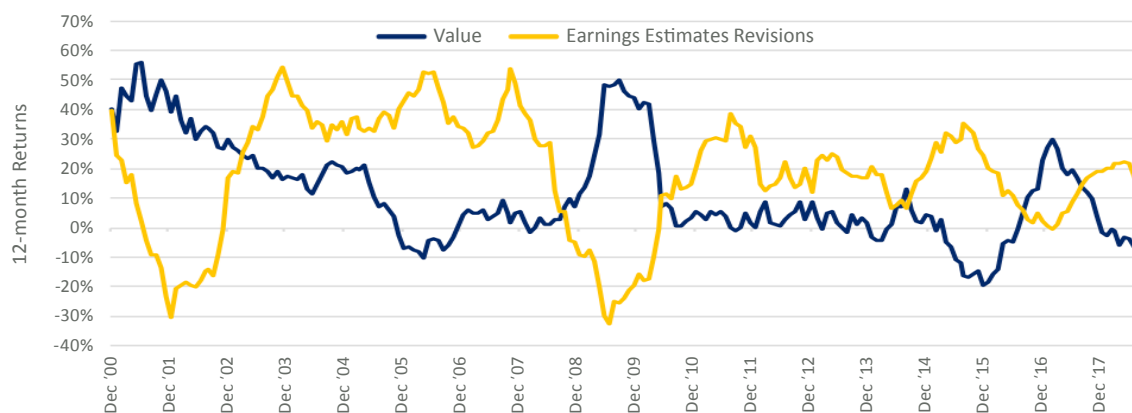

EXHIBIT 2B. ROLLING 12-MONTH PERFORMANCE OF VALUE AND EARNINGS ESTIMATES REVISIONS WITHIN MSCI EMERGING MARKETS INDEX

Note: 12-month compounded interquintile (Q1 – Q5) USD returns to Value and Earnings Estimates Revisions factors within the MSCI World Index (Exhibit 2A) and MSCI Emerging Markets Index (Exhibit 2B) from December 2000 to July 2018. Value factors consist of Forward Earnings to Price, Earnings to Price, Book to Price, Dividend Yield, and Cash Earnings to Price ratios. Earnings estimates revisions factors consist of Starmine Analyst Revisions Model (ARM) score and 3-month diffusion in forward earnings-per-share (EPS) estimates. Performance assumes no transaction costs and includes the reinvestment of dividends and income gross of withholding taxes. Source: Causeway Analytics, MSCI, Starmine, FactSet
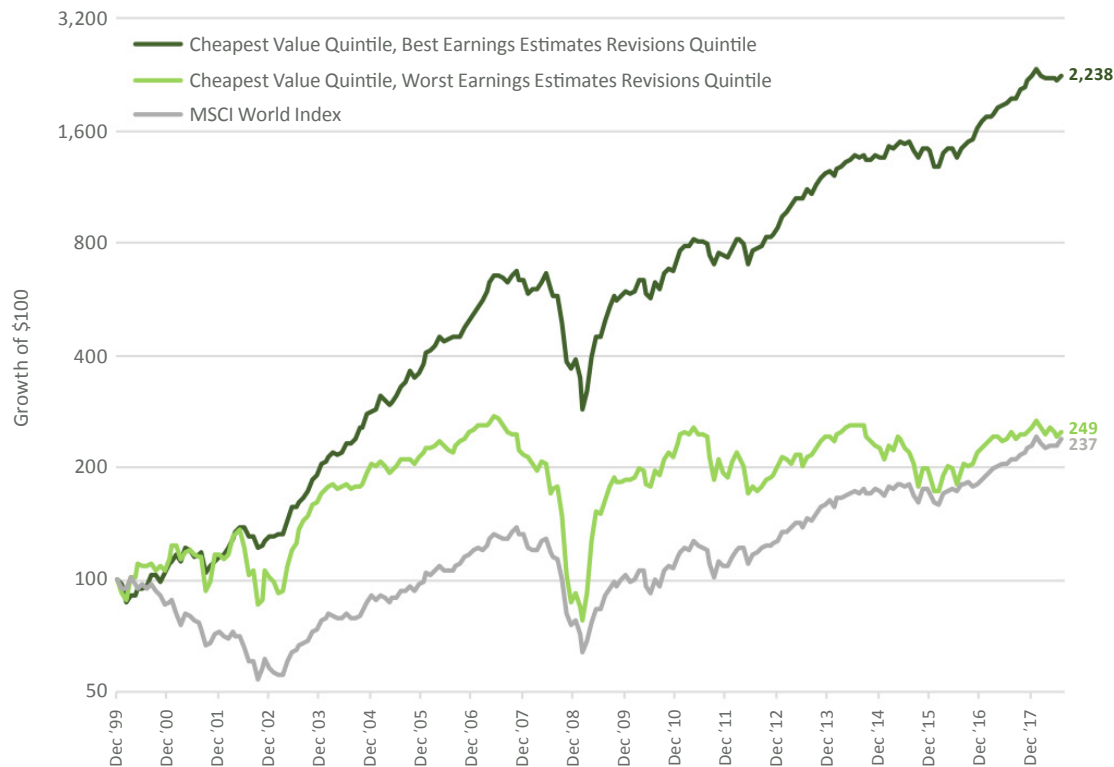
We observe an inverse relationship in the return streams of these value and earnings estimates revisions strategies, and the actual correlations confirm this: -0.56 correlation within the MSCI World Index and -0.59 correlation within the MSCI Emerging Markets Index. In isolation, these strategies perform at very different points in time.

But what if we create a strategy that combines them? Specifically, what if we buy value stocks that are experiencing earnings estimates upgrades? How much better is this strategy than buying value stocks undergoing earnings estimates downgrades? To test this, we quintile our universe by value factors every month, and then within those value quintiles, we sort again by earnings estimates revisions factors. This two-stage sort allows us to examine the incremental power of adding earnings estimates revisions as a stock selection factor. Rebalancing monthly, we then measure cumulative performance and return characteristics of each value/earnings estimates revisions quintile combination since 2000 in Exhibit 3. Once again, we perform this analysis within the MSCI World Index (Exhibit 3A) and MSCI Emerging Markets Index (Exhibit 3B).

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Combining Value and Earnings Estimates Revisions increased risk-adjusted returns

EXHIBIT 3A. CUMULATIVE RETURN CHARACTERISTICS TO VALUE AND EARNINGS ESTIMATES REVISIONS IN THE MSCI WORLD INDEX UNIVERSE

Legend:
- Cheapest Value Quintile, Best Earnings Estimates Revisions Quintile
- Cheapest Value Quintile, Worst Earnings Estimates Revisions Quintile
- MSCI World Index

End values: 2,238; 249; 237

Annualized Active Return	Earnings Estimates Revisions Quintile					
	1	2	3	4	5	Q1-Q5
Value Quintile 1	13.4%	10.8%	4.5%	5.5%	0.3%	13.1%
2	9.7%	4.4%	2.5%	5.4%	2.9%	6.8%
3	3.9%	3.8%	4.6%	0.7%	0.5%	3.4%
4	4.7%	2.5%	2.1%	2.0%	0.4%	4.2%
5	4.7%	0.5%	0.3%	-1.8%	-7.8%	12.5%
Q1-Q5	8.7%	10.3%	4.2%	7.2%	8.1%	

Tracking Error	Earnings Estimates Revisions Quintile					
	1	2	3	4	5	Q1-Q5
Value Quintile 1	9.2%	10.0%	10.0%	12.6%	14.3%	-5.2%
2	7.4%	6.6%	7.2%	8.1%	9.2%	-1.9%
3	7.4%	6.0%	6.2%	5.9%	7.6%	-0.2%
4	6.8%	5.6%	5.4%	5.9%	8.2%	-1.4%
5	9.6%	7.4%	7.0%	8.0%	12.4%	-2.8%
Q1-Q5	-0.4%	2.6%	3.0%	4.6%	1.9%	

Info. Ratio	Earnings Estimates Revisions Quintile					
	1	2	3	4	5	Q1-Q5
Value Quintile 1	1.46	1.09	0.45	0.44	0.02	1.44
2	1.32	0.67	0.34	0.66	0.31	1.00
3	0.53	0.62	0.75	0.12	0.07	0.46
4	0.68	0.44	0.39	0.34	0.05	0.63
5	0.49	0.07	0.04	-0.22	-0.63	1.12
Q1-Q5	0.98	1.02	0.41	0.66	0.65	

Batting Avg.	Earnings Estimates Revisions Quintile					
	1	2	3	4	5	Q1-Q5
Value Quintile 1	67.7%	64.1%	55.2%	55.6%	53.8%	13.9%
2	68.2%	55.6%	52.9%	58.3%	50.2%	17.9%
3	58.3%	55.2%	57.0%	45.7%	52.0%	6.3%
4	60.1%	52.0%	54.3%	53.8%	47.1%	13.0%
5	60.1%	54.3%	54.3%	48.9%	41.3%	18.8%
Q1-Q5	7.6%	9.9%	0.9%	6.7%	12.6%	

Note: All stocks in the MSCI World Index are first sorted into Value quintiles and then Earnings Estimates Revisions quintiles at the end of each month from December 1999 to July 2018. The performance of the equal-weighted portfolio of each quintile combination is tracked for the subsequent month, and then portfolios are rebalanced every month assuming no transaction costs. Value factors consist of Forward Earnings to Price, Earnings to Price, Book to Price, Dividend Yield, and Cash Earnings to Price ratios. Earnings estimates revisions factors consist of Starmine Analyst Revisions Model (ARM) score and 3-month diffusion in forward earnings-per-share (EPS) estimates. Performance includes the reinvestment of dividends and income gross of withholding taxes. Source: Causeway Analytics, MSCI, Starmine, FactSet

EXHIBIT 3B. CUMULATIVE RETURN CHARACTERISTICS TO VALUE AND EARNINGS ESTIMATES REVISIONS IN THE MSCI EMERGING MARKETS INDEX
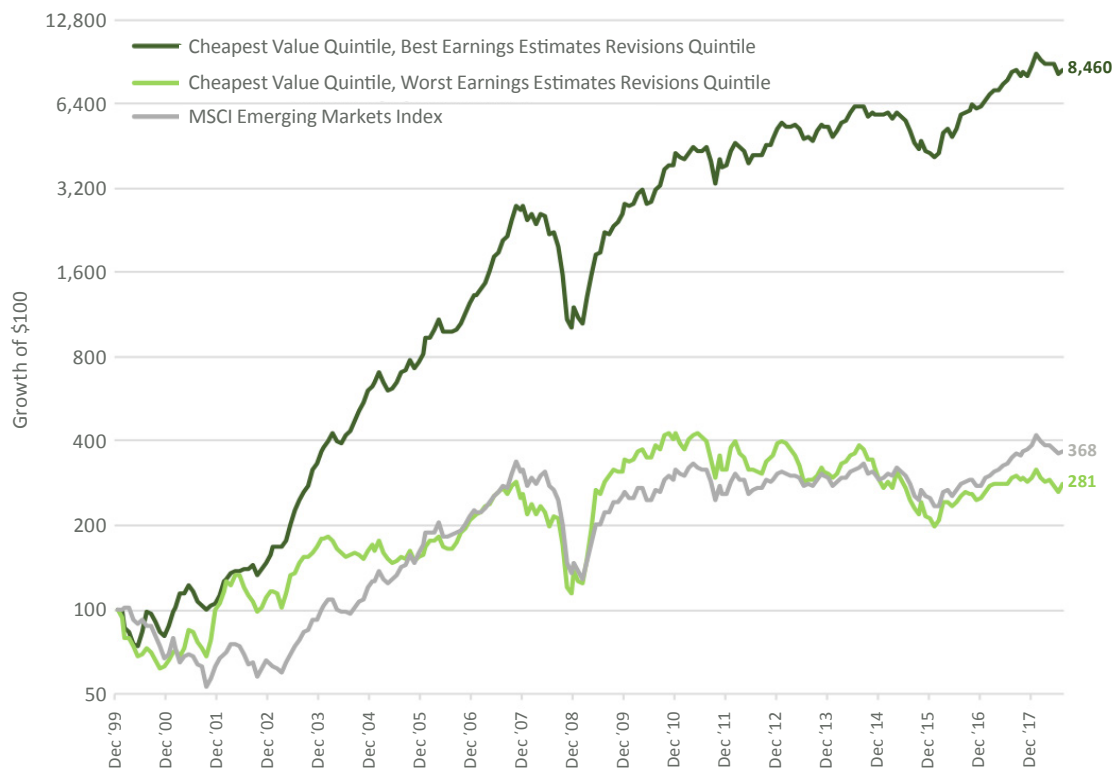
Legend:
- Cheapest Value Quintile, Best Earnings Estimates Revisions Quintile — 8,460
- Cheapest Value Quintile, Worst Earnings Estimates Revisions Quintile — 281
- MSCI Emerging Markets Index — 368

Y-axis: Growth of $100

Annualized Active Return	Earnings Estimates Revisions Quintile					
Value Quintile	1	2	3	4	5	Q1-Q5
1	19.7%	10.8%	8.9%	4.7%	-1.5%	21.2%
2	14.8%	3.3%	4.0%	-4.9%	-2.4%	17.3%
3	11.0%	3.4%	0.0%	-6.1%	-6.1%	17.1%
4	11.1%	0.8%	-4.6%	-4.8%	-8.6%	19.7%
5	8.7%	0.5%	-7.1%	-6.1%	-11.2%	20.0%
Q1-Q5	10.9%	10.3%	16.0%	10.8%	9.7%	

Tracking Error	Earnings Estimates Revisions Quintile					
Value Quintile	1	2	3	4	5	Q1-Q5
1	13.5%	12.0%	12.7%	13.0%	15.9%	-2.3%
2	10.1%	9.8%	10.2%	10.5%	11.7%	-1.7%
3	10.0%	9.7%	11.2%	10.8%	11.1%	-1.1%
4	9.8%	8.5%	8.5%	12.0%	11.2%	-1.4%
5	10.6%	10.8%	10.2%	12.4%	12.2%	-1.6%
Q1-Q5	2.9%	1.1%	2.5%	0.7%	3.7%	

Info. Ratio	Earnings Estimates Revisions Quintile					
Value Quintile	1	2	3	4	5	Q1-Q5
1	1.46	0.90	0.70	0.36	-0.10	1.55
2	1.48	0.33	0.39	-0.47	-0.21	1.68
3	1.10	0.35	0.00	-0.57	-0.54	1.64
4	1.13	0.10	-0.54	-0.40	-0.77	1.90
5	0.83	0.04	-0.69	-0.49	-0.92	1.75
Q1-Q5	0.63	0.86	1.39	0.85	0.83	

Batting Avg.	Earnings Estimates Revisions Quintile					
Value Quintile	1	2	3	4	5	Q1-Q5
1	65.0%	60.1%	55.6%	52.5%	42.2%	22.9%
2	67.3%	54.7%	54.3%	42.6%	43.5%	23.8%
3	66.4%	55.2%	50.7%	40.8%	38.6%	27.8%
4	64.1%	50.2%	45.3%	39.9%	38.6%	25.6%
5	62.3%	51.6%	45.3%	43.0%	36.8%	25.6%
Q1-Q5	2.7%	8.5%	10.3%	9.4%	5.4%	

Note: All stocks in the MSCI Emerging Markets Index are first sorted into Value quintiles and then Earnings Estimates Revisions quintiles at the end of each month from December 1999 to July 2018. The performance of the equal-weighted portfolio of each quintile combination is tracked for the subsequent month, and then portfolios are rebalanced every month assuming no transaction costs. Value factors consist of Forward Earnings to Price, Earnings to Price, Book to Price, Dividend Yield, and Cash Earnings to Price ratios. Earnings estimates revisions factors consist of Starmine Analyst Revisions Model (ARM) score and 3-month diffusion in forward earnings-per-share (EPS) estimates. Performance includes the reinvestment of dividends and income gross of withholding taxes. Source: Causeway Analytics, MSCI, Starmine, FactSet

The active returns of value stocks with the best earnings estimates revisions have outperformed those with the worst revisions by over 13% annually since 2000.

Starting with the results from the MSCI World Index in Exhibit 3A, let's focus on value quintile #1 (the top row of the tables), which represents the cheapest 20% of stocks and the main hunting ground for value investors. Let's compare the return characteristics between those value stocks with the most positive earnings revisions (in dark green) to those with the most negative earnings revisions (in light green). The cumulative return differences plotted in the chart are large. The active returns of value stocks with the best earnings estimates revisions have outperformed those with the worst revisions by over 13% annually since 2000. This strategy delivered higher active returns, lower tracking error, higher information ratios, and substantially higher batting averages – the percentage of months that a strategy is outperforming the benchmark. Moreover, examining the Q1-Q5 column, we find that adding earnings estimates revisions factors significantly improved all return characteristics across all value quintiles, not just within cheap stocks. Turning to the MSCI Emerging Markets Index results in Exhibit 3B, we observe an even larger improvement in return characteristics when we incorporate earnings estimates revisions factors into a value investment strategy.

At Causeway, we believe in the superior long-term outperformance of a value investment approach, but we are also keenly aware of its potential hazards. This is why we incorporate earnings estimates revisions as an input in our investment processes. In strategies that primarily use quantitative methods for stock selection – Emerging Markets, International Small Cap, and Global Absolute Return – we use multiple measures of estimate diffusion and ARM scores in each of our alpha models. And in our more fundamental strategies – International Value and Global Value – we use earnings estimates revisions factors in our weekly screens for new investment ideas. In addition, we monitor the active exposure to earnings estimates revisions

for the portfolio as whole, and we review recent estimate revisions to help time entries and exits for portfolio holdings.

Once we identify an attractive candidate for possible inclusion in a fundamental portfolio, we will begin monitoring its earnings estimates revisions. Occasionally, this will point to additional potential downside in the share price, such as the example in Exhibit 4 below. After its ARM score peaked in February 2018, this US-listed energy services company had its earnings estimates revisions score collapse over 60% in the following months. As the earnings estimates revision scores declined, so did the share price. However, valuation multiples fell much faster than earnings estimates revisions and the sizable valuation de-rating eventually gave us the confidence to begin to add a position in client portfolios, but only at a slow and measured pace. We are waiting for an uptick in earnings estimates revisions to add meaningfully more.

Example #1: US-listed energy services company

EXHIBIT 4. SHARE PRICE AND ARM SCORE SINCE 31-DEC-2017

Source: Starmine, FactSet

In other cases, such as in Exhibit 5, the timing aligns better. After a misunderstood and unpopular acquisition announcement earlier this year, an Asian pharmaceutical company incurred a series of negative earnings estimates revisions. As the revisions bottomed and began to tick upward, we used the brief period of remaining share price weakness in April and May to add to the stock, with the expectation of a subsequent improvement in share price. The sharp upward revisions in earnings estimates conveyed urgency, and we pursued a more rapid accumulation of shares while valuation remained inexpensive.

Earnings estimates revisions are not a substitute for the detailed valuation work that underpins all of our fundamental investment strategies. What revisions can do, however, is provide helpful signals that aid in the timing and pace of purchases and sales. A buy signal becomes even stronger, for instance,

Example #2: *Asian pharmaceutical company*

EXHIBIT 5. SHARE PRICE AND ARM SCORE SINCE 31-DEC-2017
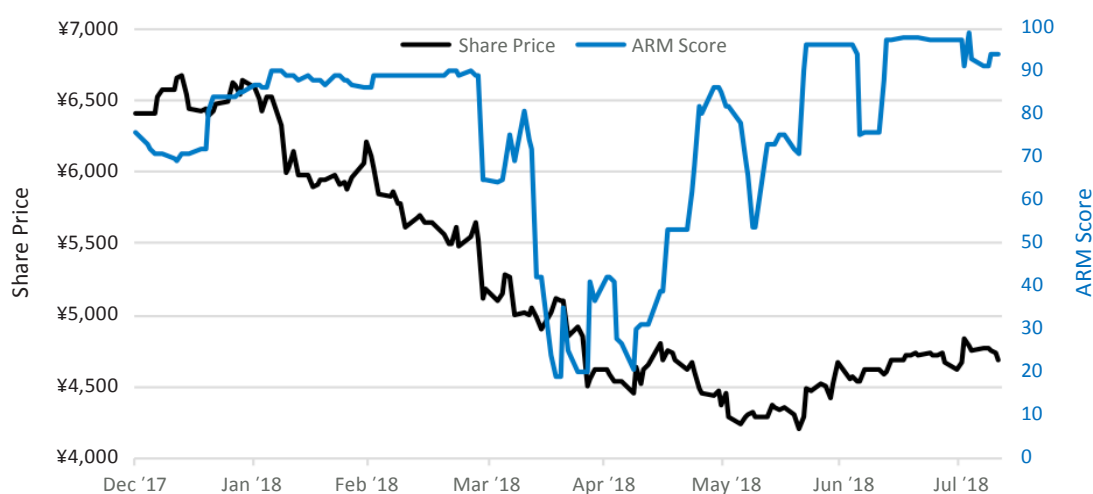
Source: Starmine, FactSet

when revisions turn positive and valuations remain low. Additionally, positive earnings estimates revisions can extend the holding period of a sell candidate, assuming valuation remains reasonable. Overall, we believe this combination of fundamental valuation with quantitative earnings estimates revisions scores enables us to be more effective at gauging the lifecycle of a stock in client portfolios and taking full advantage of the information that exists in the marketplace.