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GAME CHANGED, PROBLEMS REMAIN

An Actionable Framework for Evaluating Equity Strategies

By Rob Arnott, Brent Leadbetter, CFA®, and Jonathan Treussard, PhD

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An Actionable Framework for Evaluating Equity Strategies

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A couple of generations ago, stockbrokers attempted to beat the market by picking companies. The advent of mutual funds meant that financial advisors transitioned to picking what they hoped would be successful fund managers. So much of the investing "game" historically has been about trying to outsmart the market and other investors, and that is one very hard game to win. A popular saying in poker, often attributed to Amarillo Slim, is, "If you don't know who the sucker at your table is, it's probably you." Too few investors recognize that, for any investment manager to beat the market, investors on the other side of the trade need to underperform. If you don't know who is supposed to be losing for you to win, you are probably set to lose.

Given these challenges, many financial advisors have turned their focus to systematic strategies—often under the umbrella of smart beta, delivered in the form of mutual funds and exchange-traded funds (ETFs) tracking indexes—in an effort to sidestep the old challenges altogether. We applaud this instinct and welcome the trend, though it has created new complexities and new ways to lose, because this new world requires advisors to pick index-based funds for their clients.

This leaves many to wonder "Where do I even begin?" and "How do I make sense of the information provided by index and fund providers?" In the smart beta and factor game, it is particularly easy to fall victim to the old "proof's in the pudding" argument, when all indexes brought to market are concocted to show stellar backtests before their inception date, when nobody was able to eat the tasty pudding. Data mining is endemic in the quant community, making live results generally far more relevant than backtested performance.

Fortunately, advisors can cut through much of the noise and trickery by asking a few simple questions based on the protocol offered in Arnott et al. (2019):

1. Does a sound economic rationale explain the strategy's excess returns? If one doesn't know why a strategy should have worked, caution is in order.
2. Did rising valuations account for much of the past stellar returns of the strategy? If so, trim future return expectations to account for the higher valuations. (On the flip side, have recent poor returns created bargains that warrant adjusting return expectations up, not down?)
3. To what degree will real-world trading costs, fees, and other expenses (which are as certain as death and taxes themselves) reduce paper portfolio returns? If the results don't adjust for all of these layers of expense, watch out.

When evaluating smart beta and factor strategies, we need to look beyond impressive return histories to avoid engaging in dangerous performance chasing. The above framework aims to help investors avoid performance chasing and instead focus on strategies with robust (i.e., repeatable, in the academic sense of the term) potential for excess returns.

TURNING PAST DISAPPOINTMENT INTO FUTURE OPPORTUNITY

Hsu et al. (2016) show that, between January 1991 and June 2013, value-centric U.S. large-cap mutual fund managers delivered returns of 9.36 percent per annum, beating the S&P 500 Index by nearly 40 basis points (bps). Despite this achievement, the average investor in these funds earned only 8.05 percent, thus trailing the S&P 500 by roughly 90 bps. What accounts for the difference between what fund managers generated and what their investors earned? The answer is, sadly and predictably, performance chasing. By putting more money to work after abnormally strong performance and pulling investment dollars after disappointing performance, investors in U.S. value mutual funds managed to leave 130 bps on the table[1] (see figure 1).

Indeed, past performance and forward return expectations generally move in opposite directions (i.e., stellar performance pushes prices higher and thus lowers future return prospects). This fortunately presents an opportunity: Those

who can manage a little mental jujitsu on themselves (and their clients) may be able to generate tens of basis points by simply reframing conversations about past performance into conversations about current valuations and forward-looking expected returns. Easy, right? Well, maybe not, but still easier than trying to outsmart the market like so many traditional investors used to.

ECONOMIC RATIONALE: WHO IS ON THE OTHER SIDE OF THE TRADE?

If we shouldn't focus solely on past returns, then where should we begin? Our experience tells us that investors should begin their evaluation process by asking whether a strategy anchors on a sound economic rationale. Before investing in any strategy—smart beta, factor-based, or otherwise—we need to identify the source of excess returns. In order for a strategy's past excess returns to persist in the future, a class of investors must exist and be willing to accept the underperformance that comes with being on the other side of the trade. Otherwise, the strategy's excess returns are unlikely to repeat.

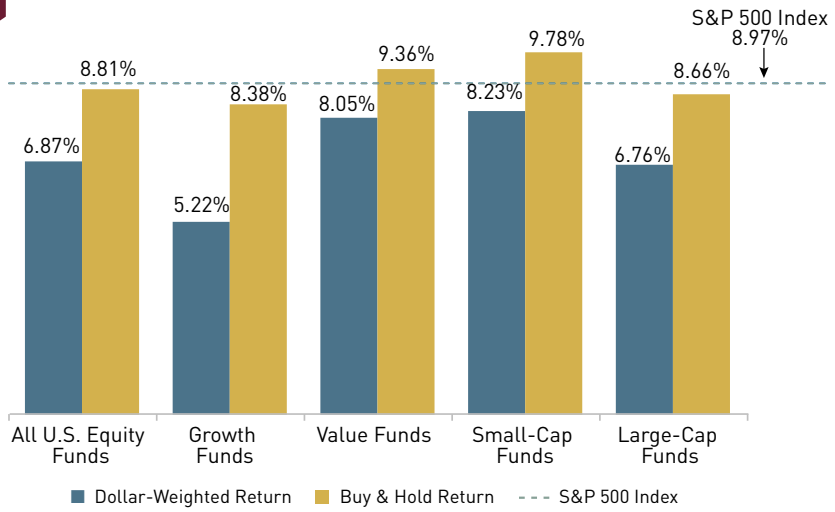
To clarify what we mean by a sound economic rationale, consider the example of a strategy that completely lacks any economic rationale. One of Research Affiliates' senior advisors and partner, Cam Harvey of Duke University's Fuqua School of Business, shared figure 2 at our recent annual Research Affiliates Advisor Symposium in Newport Beach.

At first glance, this appears to be an extraordinarily compelling return simulation. The strategy delivered substantial cumulative returns over a period of more than 50 years. Moreover, it experienced only a modest decline in 2000 during the implosion of the tech bubble, and actually appreciated meaningfully during the 2008–2009 global financial crisis. What's not to like?

The label at the top of figure 2 gives away the problem with adopting this strategy: Going long the stocks of companies that had an "S" in the third place of their ticker symbol and short the stocks of companies that had a "U" in the third place of their ticker symbol. This graph may be the quintessential example of a backtest whose fabulous returns are completely spurious. There is no reason to believe that the strong strategy returns will persist in the future because no one has ever sat down to build a portfolio and said to themselves, "I need to avoid companies that have an 'S' in the third place of their ticker symbol, regardless of how attractive these firms may otherwise be."

Figure 1

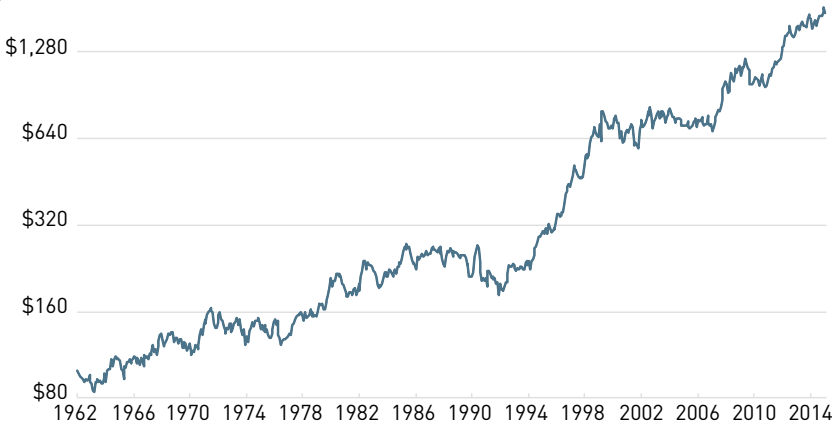
MUTUAL FUND INVESTOR RETURNS 1991–2013



Source: Hsu et al. (2016)

Figure 2

LONG S(3) AND SHORT U(3)—GROWTH OF $100 1962–2015



Note: Strategy return scaled to match S&P 500 Index T-bill volatility during this period.
Source: Arnott et al. (2019)

Let's apply this first test to some of the most popular factor-based strategies: momentum, value, low volatility, and quality:

Momentum: Investors take some time to integrate new information into their valuation models for securities. This non-immediate response to new information arguably creates a momentum effect.[2] The Achilles' heel for momentum is that we're buying stocks after they've become more expensive and selling them after they've become cheaper. It's an anti-value strategy, so its payoff pattern is short and fast; for

buy-and-hold investors, who want to hang onto whatever they recently bought, momentum can be dangerous. High turnover is needed to keep the momentum fresh. Unfortunately, as we will see in our evaluation of trading costs, high turnover strategies, such as momentum, often sacrifice much of their expected excess returns to trading costs and hidden costs (e.g., missed trades).

Value: Investors tend not to incorporate all new information immediately, but once they do incorporate new information, they tend to exaggerate this information's relevance to long-term corporate prospects (alternating between fear and greed). We've described this as market hyperopia, the opposite of market myopia, presuming that recent good (or bad) news presages good (or bad) news far into the future. The market tends to get the direction right, but the magnitude wrong, excessively shying away from companies struggling with bad news and overpaying for companies riding high at peaks in their business cycles.[3]

Low volatility: Just as lottery tickets generate sales despite negative expected returns, highly volatile stocks tend to attract investors that seek abnormally large upside potential, even if the baseline is for relatively uninspiring performance.[4] Low-volatility portfolios may not necessarily prove to be robust sources of absolute excess returns,[5] but they typically are expected to generate risk-adjusted excess returns in the form of attractive Sharpe ratios. The Achilles' heel of low-volatility indexes has tended to be valuations, as we will discuss below.

Quality: The economic rationale for quality as a standalone source of robust returns is less compelling. Why would any investor not want to own quality (e.g., highly profitable) companies? Fortunately, quality tends to supplement value strategies well by reducing exposure to value firms on the brink of insolvency.[6] As with low volatility, the Achilles' heel is valuation. Higher-quality stocks should command higher valuation multiples—but how much higher is too high?

WERE STRONG RETURNS DRIVEN SIMPLY BY RISING VALUATIONS?

Assuming that an investor is considering a strategy with a solid economic rationale, the next step is to determine how much of the strategy's past returns, gross of trading costs, are likely to persist in the future. In particular, what fraction of past excess returns can be attributed to changes in valuations? Indeed, we should view rising valuations as handicapping future potential performance.

A simple mechanism to answer this question is to disaggregate excess returns into two complementary forms of outperformance, which we call "revaluation alpha" and "structural alpha."[7] Revaluation alpha is the share of a strategy's excess returns due solely to the portfolio out(under)performing its benchmark index because it became more (less) expensive relative to that same benchmark. The excess return left over after we account for revaluation alpha is structural alpha (and noise).

Again, a simple example may illustrate most effectively these sources of returns. Suppose we have two strategies, each having doubled the performance of the same benchmark over the evaluation period (see table 1). Each began the period trading at the same valuation level as the market in terms of metrics, such as price/earnings, price/sales, price/cash flow, and price/book value. At the end of the evaluation period, Strategy A has become twice as expensive as the benchmark, while Strategy B's valuation level has remained in line with that of the benchmark. Of the two, which is more attractive on a go-forward basis? Strategy B, of course. All of Strategy A's excess return can be explained by revaluation alpha, and therefore none of A's returns are of the structural nature, and thus less likely to persist in the future. In order for Strategy A to repeat its outperformance relative to the market, its current valuation premium to the market may well need to double yet again, because rising relative valuations fully explained its past excess returns.[8]

Consistent with the tenets of value, we could further make the argument that not only are positive excess returns derived from valuation appreciation less likely to repeat than structural alpha, they could just as easily reverse and turn negative. Continuing our simplified hypothetical, what is to stop Strategy A's valuation from reverting toward par with the benchmark, flipping what had been a performance tailwind into a performance headwind? Buying into strategies that have appreciated in value relative to their market benchmark, even strategies based on robust and academically proven factors, is just a form of performance chasing.

Table 1

REVALUATION ALPHA EXAMPLE

	Beginning Valuation	Ending Valuation	Return	Excess Return	"Valuation Alpha"	"Structural Alpha"
Strategy A	1	2	200%	100%	100%	0%
Strategy B	1	1	200%	100%	0%	100%
Benchmark	1	1	100%			

Source: Research Affiliates. Hypothetical example, for illustrative purposes only.

The flip side is equally relevant. If a strategy has merely matched the market (for example) over the past five or 10 years, but has become materially cheaper relative to the market over that same span, it's a buy, not a sell.

HOW MUCH WILL TRADING COSTS ERODE PERFORMANCE?

Implicit transaction costs are the third variable to consider. How much of a strategy's simulated excess returns are likely to disappear when we actually trade it as a live portfolio? For example, outsized simulated excess returns generated by a strategy that regularly turns over small and illiquid companies may not translate into meaningful outperformance in the real world. Many return simulations are purely theoretical in nature, incorporating few to no assumptions regarding trading costs. Just as the application of a uniform 50-percent reduction to all backtested excess returns can be overly simplistic, we must estimate trading costs based on each strategy's rules and characteristics rather than applying the same cost estimates to all indexes across the board (e.g., equally weighted versus fundamentally weighted indexes).

When discussing the implicit trading costs of a rules-based strategy, the adjective "implicit" is an important modifier, because we must examine costs not captured by the standard, or explicit, costs to which many investors already pay attention. Explicit costs—such as expense ratios, bid-ask spreads, premiums or discounts to net asset value, and implementation shortfall of an investment vehicle relative to the index it tracks because of sampling or asynchronous trading—impact investment vehicles themselves, not the underlying strategies those vehicles follow. In contrast, implicit costs affect not just investment vehicles, but also the indexes tracked by those vehicles. Importantly, implicit costs can result in a meaningful difference between live and simulated returns for indexes.

Aked and Moroz (2015) provides a framework for trading costs for rules-based strategies in which we can estimate implicit costs based on an index strategy's assets under management (AUM), turnover, tilt, coverage, and trading frequency.

Many return simulations are purely theoretical in nature, incorporating few to no assumptions regarding trading costs.

- AUM represents the amount of cumulative assets across all of the mutual funds, ETFs, separately managed accounts, and so forth, following a given index.
- Turnover is the total annual turnover of the strategy, including rebalancing trades as well as positions entirely added and removed.
- Tilt captures a strategy's deviation from a volume-weighted index, which itself represents an ideal index from a trading perspective.
- Coverage is the ratio of the total trading volume of the positions in the portfolio to the total trading volume of the positions in the benchmark.
- Trading frequency represents the number of days across which the strategy spreads it trades each year. The higher a strategy's AUM, turnover, and deviation from a volume-weighted index, the higher its trading costs. The higher a strategy's coverage and trading frequency, the lower its trading costs.

Conveniently, a single equation captures the essence of the model:

$$\text{Implicit Trading Cost} = (\text{AUM} \times \text{Turnover} \times \text{Tilt}) / (\text{Coverage} \times \text{Trading Frequency})$$

The five variables in this model are applied multiplicatively. Assume hypothetical Strategy X has double the AUM, turnover, and tilt of Strategy Y and half the coverage and trading frequency of Strategy Y. Strategy X would not exhibit trading costs double those of Strategy Y. Rather, Strategy X's trading costs would be 32 times as high as Strategy Y's (2^5 = 32). Differences in implicit trading costs between strategies can reach hundreds of basis points and can often dwarf differences in explicit costs such as expense ratios.

APPLYING THIS FRAMEWORK

Investors often focus on returns, whether actual or simulated, and explicit costs, such as expense ratios, when evaluating investment vehicles. We believe the assessments of smart beta and factor strategies by advisors should go beyond return and expense ratio comparisons. We suggest advisors ask three questions when evaluating options for their clients' portfolios:

What is the economic rationale for the strategy? Avoid strategies for which you are unable to identify a reason why investors would take the opposite side of the strategy's trades.

How have valuation changes impacted returns? Request the relative valuation of the strategy at the beginning and the end of the evaluation period from the product provider so you can determine how much of its returns came simply from valuation changes rather than from a structural source that is more likely to repeat. Avoid strategies that derived past excess returns largely from valuation change.

How much will it cost to trade the strategy? Request the total AUM following the strategy, its turnover, tilt, coverage, and trading frequency from the product provider so you can determine the amount by which trading costs will reduce returns. Avoid strategies that will incur implicit trading costs

approaching or exceeding their structural excess return.[9]

Investors who previously did not know where to begin should quickly find themselves ahead of the game after evaluating factor and smart beta strategies using this framework.

Rob Arnott is the founder and chairman of the board of Research Affiliates. He earned a BS summa cum laude in economics, applied mathematics, and computer science from the University of California, Santa Barbara. Contact him at arnott@rallc.com.

Brent Leadbetter, CFA®, is a product specialist for RAFI Fundamental IndexTM strategies. He earned a BA in history from the University of Michigan and an MBA from the Anderson School of Management at the University of California, Los Angeles. Contact him at leadbetter@rallc.com.

Jonathan Treussard, PhD, is a partner and head of product management at Research Affiliates. He earned a BA summa cum laude in economics and international studies from the University of California, Los Angeles and a PhD in economics with a specialization in derivatives theory and life-cycle finance from Boston University. Contact him at treussard@rallc.com.

ENDNOTES

1. The performance gap was more than twice as bad for growth investors, who presumably are more prone to chasing fads and chasing performance.
2. Multiple behavioralists, notably, Barberis et al. (1998) and Daniel et al. (1998), have discussed the biases that lead to investor underreaction and consequently to the momentum effect.
3. Chaves and Arnott (2012) have argued previously that the value effect is driven by routine rebalancing, which takes advantages of the market's excesses.
4. Dorn et al. (2012) show that speculative trading decreases when lottery prizes rise.
5. After all, how can we expect a lower-risk portfolio to have a higher risk premium? This is at odds with basic finance theory.
6. Kalesnik and Kose (2014) provide a deeper look at our views on quality and its role in a value portfolio.
7. This terminology was first introduced in Beck et al. (2016), which asked the surprisingly controversial question of whether investors in smart beta strategies should consider valuations in setting reasonable expectations for future returns. Had the authors asked whether valuations matter in picking single stocks, the same exposition likely would have received a collective yawn, instead of provoking outrage. It bears mention that, despite our own aggressive efforts over the past three years to encourage academe to strip out revaluation alpha, we are unaware of a single factor paper that has done so.
8. Investors often follow a simple heuristic when evaluating simulated returns and apply a 50-percent haircut to the magnitude of any excess returns generated in a backtest. Returning to our example portfolios, a 50-percent haircut would have been perfectly appropriate on average. But simply reducing expected excess returns by 50 percent for each strategy would have resulted in a vastly overoptimistic return expectation for Strategy A and an overly pessimistic return expectation for Strategy B. We could more reasonably assume that 0 percent of A's excess returns will repeat because the simulated alpha all came from revaluation, while we could assume that 100 percent of B's excess returns will repeat, before transaction costs.
9. The Research Affiliates Smart Beta Interactive tool, https://interactive.researchaffiliates.com/smart-beta#!/strategies, lists both valuation and trading cost data for a wide range of representative strategies across value, income, low volatility, quality, momentum, and size factors applied in the U.S., global developed, and emerging markets.

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INVESTMENTS & WEALTH INSTITUTE®
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5619 DTC Parkway, Suite 500
Greenwood Village, CO 80111
Phone: +1 303-770-3377
Fax: +1 303-770-1812
www.investmentsandwealth.org