

# The Last Smart Beta Paper You'll Ever (Have to) Read



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Institutional investors could be forgiven for rolling their eyes at yet another article on “smart beta.” Indeed, the hype around this topic over the last few years has been intense. Smart beta products seem to launch daily, webinars on the topic are offered weekly, and papers roll out monthly. Proponents of smart beta argue that it is the new cure-all. Replace your passive managers! (Solve the problems of cap-weighted indexes.) Replace your

active managers! (Solve the problems of high fees.)

We believe that smart beta will follow a path similar to other strategies that once promised to revolutionize portfolio management. What does this path look like? A handful of strategies will be great successes, enhancing investment outcomes for the pioneers who embrace them. A much wider range of me-too strategies, attempting to ride the coattails of the latest trend, will leave behind a trail of disappointed investors. But even if smart beta products disappoint, eventually many of the key underlying ideas will have a lasting impact on the way institutional investors manage portfolios. This makes the key concepts behind smart beta important — even for those who will never buy the products being hawked so aggressively today.

## Smart beta basics

The key insight of smart beta is that strategies built around factors such

as value, momentum, carry, and low volatility can offer attractive, sustainable expected returns that diversify the returns from a traditional portfolio driven by the performance of stock and bond markets.

Yet many smart beta approaches are constrained by being long-only, limited to equities, and focused on a single factor. Such approaches may eventually outperform traditional cap-weighted indexes. But with only modest risk-adjusted excess returns (information ratios), they are likely to suffer short periods of sharp underperformance and protracted stretches of flat or negative excess returns. Hence, their long-term results net of transaction costs and fees are likely to disappoint — even if the latter are modest.

## Smarter than smart beta

Strategies that transcend the limitations of basic smart beta hold greater promise. For example, long-short approaches that seek to isolate specific factors without incurring market exposure have compelling diversification potential. Strategies outside equities, notably within fixed income, offer the possibility of outperforming widely followed indexes that often bear little relation to the goals of the investors who use them. Lastly, approaches that combine multiple factors have strong potential to deliver better risk-adjusted returns than single-factor portfolios. We believe this potential is best realized in integrated approaches that combine multiple factors, where unintended risks can be mitigated by the manager at the portfolio level, rather than in an

**Figure 1: Some Key Factors**

| Beta       | Implementation   | Why can it work?  |
|------------|--|---|
| Value      | Buy “cheap” assets   | Mean-reversion; tendency of market to extrapolate bad news                                  |
| Momentum   | Buy assets with strong near-term performance                           | Market tendency to trend more often than not; investors are slow to process new information |
| Size       | Buy assets with lower market capitalization                            | Less established companies viewed as less desirable; investors overpay for large issuers    |
| Volatility | Buy assets with low realized or expected volatility                    | Investors overpay for more volatile “lottery-like” investments                              |
| Quality    | Buy assets with stable earnings, low operational or financial leverage | Power of compounding through a market cycle and avoid large losses                          |
| Carry      | Buy assets with high current income                                    | Positive return if market conditions remain stable or little changed                        |
| Liquidity  | Buy less-liquid investments  | Investor preference for more liquid assets; market compensation for providing liquidity     |

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uncoordinated grab-bag of single-factor strategies.

Another major step in moving beyond basic smart beta is to acknowledge that any strategy deviating from a market-cap-weighted index is inherently active. This means investors should beware of “index-like” smart beta strategies that seem to dominate the space. Indexes are based on a clear set of construction rules that are transparent and static. But these are not desirable characteristics for active strategies. Transparent rules mean that others in the market can

## The key concepts behind smart beta are important — even for those who will never buy the products hawked so aggressively today.

learn and take advantage of your positioning. Static rules mean that the investment process can’t adapt to changing market conditions or crowded trades. (Although smart beta is sometimes compared to traditional quantitative equity or to the “enhanced index” strategies that gained popularity in the early 2000s, those approaches typically benefit from dynamic portfolio management by a team of specialists who continuously review and refine their models — and neither approach

publicizes its investment model for all to see.)

Investors who acknowledge that smart beta strategies are active approaches are more likely to focus on strategies that incorporate some degree of active skill, whether that comes from better or more differentiated factor definitions, implementation improvements in areas such as trading and transaction cost control, forward-looking insight, or better portfolio construction through risk management or factor timing.

### Putting smart beta concepts to work

Amidst the cacophony of voices opining on smart beta, it’s easy to forget that most investors pursuing the strategy are trying to accomplish one of three simple goals:

*Enhance returns in a world of diminished expectations.* The biggest bang for the smart beta “buck” may be in fixed income or commodities, where we believe traditional benchmarks are often mis-aligned with investor objectives.

*Improve transparency or reduce costs.* Consider replacing or complementing relatively costly, opaque hedge-fund strategies with factor-driven alternative beta strategies that offer more efficient access to many of the key drivers of

hedge-fund returns and differentiation.

*Improve portfolio construction and risk management.* Thoughtfully constructed low-volatility strategies — those that are conscious of sector risk and don’t rely on unintuitive, over-engineered optimizations — may be useful. Or, investors can adapt the ideas underlying smart beta to improve their current portfolios. This is the investor objective where we think smart beta will ultimately have the biggest impact — that is, once managers stop launching products or writing papers (sorry!) and allow their clients to actually consider what the key ideas mean.

Because factors are important drivers and determinants of portfolio performance, investors should build portfolios that are well diversified across those factors. Moreover, since factors — like markets — tend to go through up and down cycles, investors can use factor analysis to add value through active rebalancing or strategy timing.

Our take-away advice to investors is to look beyond smart beta. Stop reading papers, ignore most of the new products coming out, and focus on what these ideas mean for your portfolio and objectives. In today’s challenging investment landscape, you might uncover a few nuggets of hope buried beneath the hype.

To learn more about our research on this topic, visit [https://www.wellington.com/beyond\\_smart\\_beta](https://www.wellington.com/beyond_smart_beta)

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# SMART BETA ON THE MOVE

Smart beta strategies continue to grow as an increasing number of investors recognize that risk factors and style premia are long-term, persistent sources of return. While a definition around rules-based, passive implementation is taking hold, many providers are building dynamic strategies that are based on systematic frameworks. **By Howard Moore**

“It was a great year in 2015,” says Lynn Blake, chief investment officer of global equity beta solutions at State Street Global Advisors (SSGA). Total assets grew by 9 percent in the US, reaching more than \$566 billion in December, according to Morningstar. European growth was more dramatic, with a 29 percent rise and assets reaching \$41 billion. The investment thesis of capturing risk factor returns in a rules-based systematic way is gaining much wider traction, and investors are embracing the concepts in a much more sophisticated way as well. “As investors begin to understand how smart beta works, the difference we see now is less interest in single factor strategies, and much more in those that are multi-factor,” she says, referring to those that blend risk

factors for greater diversification, downside protection, and the potential for better risk-adjusted returns.

Smart beta is a term used to describe systematic, rules-based factor investing, which explicitly allocates to securities that demonstrate the properties of acknowledged factors. Grounded in academic theory, tested and proven to have generated durable investment premiums through time, the most common and acknowledged factors include low volatility, size, momentum, and value. Smart beta is usually implemented passively, using indices tilted toward specific factors, typically single but sometimes in combination, and is distinguished from indices that are weighted by the market capitalization of the underlying securities. It gets more sophisticated from there, and some providers use a broader set of styles to extract return premia. They are implemented differently than the classic smart beta factors as well, and include



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**“The whole notion of factors is changing for the better the way that institutions build active portfolios in general.”**

value, momentum, carry and defensive, which itself includes low risk, low beta, and high quality. The idea of style premia recognizes a broader implementation of systematic sources of return along that spectrum.

Alternative beta strategies are pure plays on factors, detached from the direction of the market and from each other. They can be combined flexibly with traditional market betas and alpha sources for different objectives. Their low correlation to markets and to other factors make them potentially valuable building blocks for constructing more effective investment portfolios. This is true for exposures in equities, fixed income and increasingly in absolute-return oriented alternative beta strategies that include factors like value, momentum, and carry.

“There’s a lot of steam gathering behind smart beta assets,” says Dan Draper, managing director of global ETFs at Invesco PowerShares. They’ve had a 25 percent annual growth rate over the past three years, compared to about 11 percent for the broader ETF industry. “It’s an amazing development when you consider that many of the world’s largest fiduciaries that use ETFs are benchmark-constrained, and for them to reallocate and tilt the portfolio with factors demonstrates remarkable interest in the strategies,” he says.

“There has definitely been more interest and increased adoption,” says Conor McCarthy, director of client investment solutions at Wellington Management. One positive byproduct of smart beta is that investors of all types are thinking of risk exposures more thoughtfully and now have a heightened level of awareness with the whole notion of factors and how they impact a portfolio.

“We definitely see increasing interest, pretty much across the board,” says Ronen Israel, principal and portfolio manager at AQR. “More people are thinking about their portfolios and allocations from a style perspective and moving from traditional active management to get exposures to these types of returns in ways that are more efficient, transparent and at a fairer fee.” It comes in several different forms, including the long-only, single-style equity strategies, which is what most people refer to as smart beta; the long-only equity, multi-style versions; and there are the long/short multi-style, multi-asset class versions as well.

## Factor Focus

Historically, growth- and income- oriented strategies have attracted the most assets, but now the established industry-consensus factors—value, small cap, momentum, quality and especially low volatility are coming into their own. “Overall, there is a movement among investors who in the past would have followed styles—value, growth, large cap, small cap, sector and region—are now allocating risk more precisely through factors and producing better outcomes. “Low volatility and quality have been attractive places to be in the last three to four years,” says Draper. This has been especially true since December 2015, when challenging earnings announcements and estimates were announced. “A lot of investors want to own the highest quality companies, which are generally evaluated by the income statement, balance sheet and cash flow metrics,” he says.

Others agree. The past year has seen the greatest interest in low volatility and the combination of low volatility with momentum and low volatility with quality. “Tilting toward low beta stocks is not a big surprise when the market becomes volatile and investors start to look for downside protection,” says Blake. However, most of the growth has been in two-, three- and even four-factor strategies. “The benefit of multi factor is diversification,” she says.

On the long-only side, there recently has been some increased interest in defensive strategies. “That could be because of recent market volatility,” says Israel. Investors are looking to capture the risk-adjusted return advantage of those strategies, which hold safer, lower risk securities and can still generate equity-like returns. “Similarly, we see increased interest in diversifying sources of return, as well as long/short strategies, which are also uncorrelated,” he says.

In the current market environment with likely sluggish equity returns, slow growth, low inflation, and probably limited policy tightening, there is likely more risk to the downside. “It’s looking like a pretty choppy ride ahead,” says Blake. These multi-factor strategies can be a way to get more from the core, standing in for some traditional cap-weighted passive investments. “In these markets, value and size tend to perform relatively poorly, while low volatility, quality and even momentum can perform

# SMART BETA IS JUST THE FIRST WAVE OF THE FACTOR REVOLUTION



By Jennifer Bender, PhD  
Head of Research for Global Equity Beta Solutions, State Street Global Advisors

## What's driving the interest in Smart Beta?

There are two big trends driving interest. One is that we're living in a lower-for-longer return environment. Investors across the board are going to have more challenges achieving their investment objectives when the equity risk premium is expected to be near low single digits. So they need to make their risk budgets and manager fees work harder to reach their goals. That has implications for how they are structuring their portfolios and their expectations of high-fee active managers.

Secondly, looking at portfolio diversification in a way that goes beyond asset class labels to understand the underlying risk drivers of return has provided a powerful lens for building more capital-efficient portfolios. The tools have improved significantly over the years to help investors better understand how much of their active return is coming from true, skill-based alpha, and how much from a risk exposure that can be replicated in a more cost-efficient Smart Beta strategy. This is why Smart Beta is upending traditional active management and raising the bar on active managers to demonstrate their value-add.

## How do you define Smart Beta?

While Smart Beta has become a popular marketing term over the last few years, it is important to note that it is part of a broader discipline of factor-based investing, which is really revolutionizing how investors think about building portfolios. Factor investing is grounded in years of academic research and covers a wide spectrum of approaches and applications. It is based on the principle that there are systematic factors such as size, valuation or momentum that deliver a durable premium over the long term versus a market-cap weighted benchmark.

Smart Beta provides a rules-based, transparent way for investors to capture the well-documented factor risk premia across equities and fixed income. For many investors venturing into factor investing for the first time, tilting to one or more of these Smart

Beta factors in their core passive exposures is a way to target incremental returns in a highly fee-productive way. Our ETF structures also lend themselves well to these types of Smart Beta approaches for a broader base of investors looking for a liquid and low-cost way to express these factor tilts.

But Smart Beta is just an entry point on a continuum of factor-based approaches that go beyond stocks and bonds and involve a variety of techniques at both the asset class and the total portfolio levels. Moving along that spectrum, investors can find very sophisticated ways of specifying factors, managing them through time on both the long and the short side and pursuing real skill-based excess returns that can rival those of hedge funds but for lower fees. So Smart Beta as a label is much less important than understanding how a manager is implementing a particular factor investing strategy.

## If the empirical evidence around factor investing has been around for years, why haven't all investors already switched to this approach?

You could argue that the style box approach was an early expression of factor investing insights. But this current wave of more explicitly building portfolios around factor risk exposures rather than asset classes alone represents a significant shift away from traditional investment models and mindsets. That kind of change takes time and education, but the challenges posed by markets are prompting more investors to reconsider business as usual. State Street Global Advisors is particularly well-positioned to guide clients through this transformation as our investment heritage was built on a foundation of systematic, factor-based methodologies. Today we are extending that core expertise and developing the next generation of active, factor-based strategies, leveraging insights from big data and new analytic tools, and aiming to revolutionize the investment management industry as we know it.

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For more information about smart beta and the factor investing revolution, please visit [www.ssga.com](http://www.ssga.com)

Among the factors that the strategy considers is momentum. This emphasizes investing in securities that have had higher recent price performance compared to other securities, which is subject to the risk that these securities may be more volatile and can turn quickly and cause significant variation from other types of investments. Factor-based investing also considers the value factor. A value style of investing emphasizes undervalued companies with characteristics for improved valuations, which may never improve and may actually have lower returns than other styles of investing or the overall stock market.

Investing involves risk including the risk of loss of principal.

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Dan Draper  
Invesco Powershares

**“It’s an amazing development when you consider that many of the world’s largest fiduciaries that use ETFs are benchmark-constrained.”**

well, so having those factors in your portfolio, along with a little bit of value, which is a pretty cheap trade right now, is a nice diversifier,” she says.

### **Active, Passive and Dynamic**

Some believe that smart beta is a threat to active management. Historically, the appeal of moving away from traditional active strategies was reflective of the underperformance and high fees of active managers. “But now we’re seeing more sophisticated analysis across active portfolios that shows strong index-like characteristics with tilts towards size and value,” says Blake. “We find that many active portfolios have relatively low active risk, and as a result, limited alpha potential.” A factor-based, smart beta portfolio can replicate those types of exposures more efficiently with lower fees. As a result, investors have a better understanding of what really drives their portfolios’ performance and what it should cost. They are looking for where they can replace factor exposures with smart beta strategies and search for managers who can deliver true alpha and real outperformance. “Overall, that will generate better returns and be a much better value,” she says.

Some of the smart beta approaches select securities based on specific criteria, weight them according to strict methodologies and rebalance once a year, with no deviation. “They may be based on indices over very broad universes that are not really implementable, for example, and which may not really control for time-varying risk exposures,” says Israel. One simple example is the rules-based Fama-French factors. “They build portfolios that are dollar-long, dollar-short, but dollar-long, dollar-short isn’t always market neutral—it depends on the market exposure, or beta, of your long side versus your short side,” he says. At times, they can take on tremendous market exposure which is not what they intend to do. “When you start with a rules-based concept, these types of issues are going to crop up,” he says.

“We don’t rebalance on a set schedule—we rebalance when the portfolio you would build today is sufficiently different than the portfolio you currently hold,” says Israel. There are periods when there is a greater need to rebalance to maintain the portfolio’s characteristics. Some of these factors can

be affected by market volatility and other changes, and when the underlying holdings have changed significantly. In a multiple style context, for example, the weighting of the styles must be maintained. “Market changes may trigger rebalances, versus just waiting until the next scheduled rebalance,” he says. “We’re not going to deviate from a systematic framework—but even within that systematic framework there’s still going to be a dynamic element which allows us to more effectively capture these ideas.”

“The whole notion of factors is changing for the better the way that institutions build active portfolios in general,” says Adam Berger, asset allocation strategist at Wellington Management. Investors have a greater awareness of what factors are at work in their portfolios and what factors are driving the portfolio over time. “It’s partly about identifying overweights, areas where you have too much exposure to a single factor, and underweights, factors that in theory could be diversifying and sources of new return that you’re not adequately exposed to,” he says. On a strategic level, it’s about getting that balance right, and on a tactical level, managing it. That could be as simple as a rebalancing rule, but it also might extend to making tactical tilts in your manager lineup or in factor exposures to take advantage of opportunities in the market. “We spend a lot of time looking at what we call risk factor outliers, which is a whole different avenue of strategy development that takes advantage of opportunities that come up where one particular risk factor, maybe in a single sector or country, for example, becomes particularly cheap and represents a buying opportunity—or on the flip side, gets expensive and represents a selling opportunity,” he says.

After the financial crisis, investors are more focused on transparency and fees—asking if they are paying the right fee for what they’re getting. These strategies capture the same long-term sources of return, but in more efficient ways. “This all supports the smart beta-style premia type strategies, which are transparent by design,” says Israel. But even more important, the economic intuition and the sources of return are very transparent. “It’s not about hiring a specific manager and their magic—or idiosyncratic skill—which often can be a non-

*(continued on page 8)*



# MEASURING PORTFOLIO FACTOR EXPOSURES

## A Practical Guide

By Ronen Israel, Principal and Adrienne Ross, Vice President

### Why Should Investors Care About Factor Exposures?

Investors have become increasingly focused on how to harvest returns in an efficient way. A big part of that process involves understanding the sources of risk and reward in their portfolios. “Risk-based investing” generally views a portfolio as a collection of return-generating processes or risk factors. The most prevalent and widely harvested of these factors is the equity market (equity risk premium); but there are also others, such as value and momentum (often referred to as “style premia”).<sup>1</sup>

However, measuring exposures to risk factors can be a challenge. Investors need to understand how factors are constructed and implemented in their portfolios.

They also need to know how statistical analysis may be best applied. Without the proper model, rewards for factor exposures may be misconstrued as “alpha,” and investors may be misinformed about the risks their portfolios truly face (and the fees they pay for them). Ultimately, investors with a clear understanding of the risk sources in their existing portfolio, as well as those under consideration, may have an edge in building more efficient portfolios.<sup>2</sup>

### How to Measure Factor Exposures

A common approach to measuring factor exposures is linear regression analysis;

it describes the relationship between a dependent variable (portfolio returns) and explanatory variables (factors). Regression analysis can be done on any type of portfolio, using one factor or many. Ideally, the factors used should be similar to those present in the portfolio, or at least one should account for those differences in assessing the results (we will come back to this). The regression framework for risk factor decomposition is shown in Exhibit 1.

We can use this framework to examine the exposures of a hypothetical long-only equity portfolio that aims to capture returns from value, momentum and size style premia.<sup>3</sup> In practice an investor may not

know the portfolio exposures in advance, but since our goal is to illustrate how to best apply the analysis, we will proceed as if we do.

As our explanatory variables, we use the well-known long/short academic factors: HML, UMD,

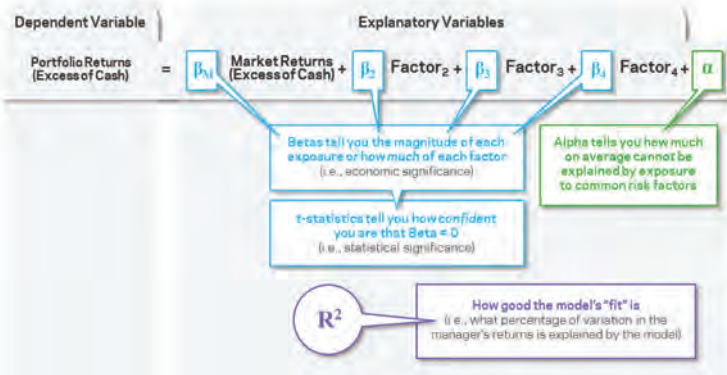
and SMB.<sup>4</sup> We use a regression model to assess drivers of portfolio returns. Specifically, we measure each factor’s contribution to portfolio returns by multiplying the factor’s beta by its respective average risk premium over the sample period (see Exhibit 2).

The results shown in Exhibit 2 are consistent with our intuition: the portfolio had positive exposures (betas) to value (HML), momentum (UMD), and size (SMB).<sup>5</sup> And because these factors each delivered positive returns over this period, this positive exposure benefited the portfolio – with value, momentum and size contributing 2.4%, 0.5% and 1.2%, respectively, to the portfolio’s excess of cash returns.

Without the proper model, rewards for factor exposures may be misconstrued as “alpha,” and investors may be misinformed about the risks their portfolios truly face (and the fees they pay for them).

### Exhibit 1: A Framework for Measuring Factor Exposures

#### Regression Approach:



For illustrative purposes only. All variables are in excess of cash. Long-only explanatory factors should be excess of the market and long/short factors are self-financed, so are already in excess of cash.





**Exhibit 2: Decomposing Hypothetical Portfolio Returns by Factors****Hypothetical Results**

January 1980–December 2014



Notes: All returns are arithmetic. Numbers may not tie out due to rounding.

Sources: Israel and Ross (2015), AQR, Ken French Data Library. AQR analysis based on a hypothetical simple 50/50 value and momentum long-only small-cap equity portfolio, gross of fees and transaction costs, and excess of cash. The portfolio is rebalanced monthly. The academic explanatory variables are the contemporaneous monthly Fama-French factors for the market (MKT-RF), value (HML), momentum (UMD) and size (SMB). The market is the value-weight return of all CRSP firms. Hypothetical data has inherent limitations some of which are discussed herein.

Another important output from Exhibit 2 is the alpha estimate, which potentially provides insight into manager “skill.” It’s important that investors are able to distinguish whether a manager is actually providing alpha above and beyond their factor exposures. But doing so requires using the correct model. Without the proper model, rewards for factor exposures may be misconstrued as alpha. This can lead to suboptimal investment choices, such as paying high fees for a manager that seems to deliver “alpha,” but really just provides simple factor tilts.

To understand this, suppose we were to look at our test portfolio against a model with the equity market as the only factor (the well-known CAPM). Against this model it would seem that a large portion of portfolio returns are dominated by “alpha,” but as we just saw, roughly 4% of the portfolio’s returns are driven by style exposures (2.4%+0.5%+1.2%=4%). These results have important implications — if investors don’t control for multiple exposures in a multi-factor portfolio, then excess returns will look as if they are mostly alpha.

It’s also important to note that “alpha” depends on what is already in the portfolio.

For any portfolio, positive expected return strategies that are uncorrelated to existing exposures can be a significant source of improvement. For example, to an investor who has passive equity market exposure, adding new sources of portfolio returns, such as value and momentum, will

For any portfolio, positive expected return strategies that are uncorrelated to existing exposures can be a significant source of improvement.

have the same effect as adding alpha to the portfolio — even if a regression containing the market, value and momentum would explain that alpha away.<sup>6</sup>

## Common Pitfalls in Measuring Factor Exposures

So far we have focused on how to apply the regression framework, but there are many pitfalls associated with regression analysis. They are nuanced and detailed, but they really do matter; they relate to errors in interpretation and factor design differences.

### Errors in Interpretation

#### Focus too much on betas and not on t-statistics

Many investors focus only on betas in assessing factor exposures but fail to account for the reliability (or statistical significance) of these estimates. Just because a portfolio has a high beta coefficient to a factor doesn’t mean it’s statistically different than a portfolio with a zero beta, or no factor exposure. As such, it’s important to look at the t-statistic for each beta; a portfolio exposure that is only economically meaningful (large beta) but not reliable (insignificant t-statistic) could impact the portfolio in a big way, but with a high degree of uncertainty.

### Comparing betas for portfolios with different volatilities

Since volatility varies considerably across portfolios, comparisons of betas can be misleading. For the same level of correlation, the higher a portfolio’s volatility, the higher its beta.<sup>7</sup> When investors fail to account for different levels of volatilities between portfolios, they may conclude that one portfolio is providing more exposure than another, which is true in notional terms — but in terms of exposure per unit of risk, that may not be the case.

### Failure to consider the R<sup>2</sup> measure

The R<sup>2</sup> measure provides insight into the overall explanatory power of the regression model; it indicates how much of the variability in returns is accounted for by the factors used. Generally, the higher the R<sup>2</sup> the better the model is in explaining portfolio returns.

### Factor Differences

In addition to the statistical issues described above, there are other questions to consider when doing regression analysis. Investors should ask themselves: what exactly are these factors I’m using and are they applicable to my portfolio? The answers to these questions affect beta and alpha estimates. Factor loadings are highly influenced by the design and universe of factors used, and alpha estimates reflect implementation differences associated with capturing the factors. We cover these considerations in detail below.

### Is the implementation comparable?

Academic factors, such as the Fama-French factors used here, do not account for implementation costs. They are gross of fees, transaction costs and taxes. They do not face any of the real-world frictions that implementable portfolios do. Differences in implementation approaches may be reflected in regression results. Even if a portfolio does a perfect job of capturing the factors, it could still have negative alpha in the regression model, which would represent implementation differences associated with capturing the factors.<sup>8</sup>

### Are the universes the same?

Academic factors span a wide market capitalization range and are, in fact, overly reliant on small-cap or even micro-cap stocks. These factors include the entire CRSP universe of approximately 5,000 stocks. Many practitioners would agree that a trading strategy that dips far below the Russell 3000 is not a very implementable one, and this is likely where most

of the bottom two quintiles in the academic factors fall.

### Is the portfolio long-only or long/short?

Long-only portfolios are more constrained in harvesting style premia as underweights are capped at their respective benchmark weights. In contrast, long/short factors (and portfolios) are purer in that they are unconstrained. These differences should be understood when performing and interpreting factor analysis.

### Is the portfolio based on multiple measures for each style?

Often, multiple measures can be used and applied simultaneously to form a more robust and reliable view of a factor. For example, while stocks selected using the traditional academic book-to-price value measure perform well in empirical studies, there is no theory that says it is the best measure for value.

### Does the portfolio have risk-controlled exposures?

Academic factors typically do not have any explicit risk controls. For example, in the

case of stocks, academic factors often do a simple ranking across stocks, and in doing so implicitly take style bets within and across industries (also across countries in international portfolios), without any explicit risk controls on the relative contributions of each. In contrast, factors implemented by practitioners may differentiate stocks within and across industries (i.e., industry views). They are designed to capture and target risk to both independently. As another example, practitioners also use risk targeting when constructing factors; this approach dynamically targets risk to provide more consistent realized volatility in changing market conditions. Finally, practitioners can also build market (or beta) neutral long/short portfolios, whereas academic factors are often dollar neutral, allowing for unintended, time-varying market bets.

## Conclusion

Regression analysis can help investors better understand the risk factors present in their portfolios, which has multiple benefits. It can help investors evaluate fees, by estimating what portion of returns can be attributed to systematic factor exposures

versus idiosyncratic sources of return which should command a premium. It can also lead to improved portfolio construction and diversification, by identifying the sources of return that are missing from, and most likely additive to, their existing portfolios.



AQR is a global investment management firm that employs a systematic, research-driven approach to manage alternative and traditional strategies.

We manage over \$141 billion for institutional investors and investment professionals.<sup>9</sup>

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1 Style premia are sources of returns that are well researched, geographically pervasive and have been shown to be persistent across both time and multiple asset classes. There is a logical, economic rationale for why they provide a long-term source of return (and are likely to continue to do so). See Asness, Moskowitz and Pedersen (2013); Asness, Ilmanen, Israel and Moskowitz (2015); and "How Can a Strategy Still Work if Everyone Knows About It?" September 23, 2015 for more information.

2 For more information on measuring portfolio factor exposures, see Israel and Ross (2015).

3 The portfolio is constructed with 50/50 weight on simple measures of value (book-to-price, using the Asness and Frazzini (2013) HML Devil methodology of current prices) and momentum (12 month price return, skipping the most recent month) within the small-cap universe.

4 For simplicity, we use academic factors, instead of practitioner factors, sourced from Ken French's data library. HML is a portfolio that goes long stocks with high book-to-market values and short stocks with low book-to-market values; UMD goes long stocks with high returns over the past 12 months (skipping the most recent month) and short stocks with low returns over the same period; SMB goes long small-market-cap stocks and short large-market-cap stocks.

5 Note that if we were to use HML Devil (using current prices) instead of HML (using lagged prices) we would see a higher loading on UMD. See Israel and Ross (2015) and Asness and Frazzini (2013) for more information on how HML can be viewed as an incidental bet on UMD, which affects regression results by lowering the loading on UMD (as HML is eating up some of the UMD loading that would otherwise exist).

6 Berger, Crowell, Israel and Kabiller (2012).

7 Based on a univariate regression.

8 Note that our hypothetical portfolio is also gross of fees, transaction costs and taxes, which makes the use of academic factors in the analysis less problematic (compared to looking at a live portfolio that faces real world frictions).

9 As of December 31, 2015.

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There is a risk of substantial loss associated with trading commodities, futures, options, derivatives and other financial instruments. Before trading, investors should carefully consider their financial position and risk tolerance to determine if the proposed trading style is appropriate. Investors should realize that when trading futures, commodities, options, derivatives and other financial instruments one could lose the full balance of their account. It is also possible to lose more than the initial deposit when trading derivatives or using leverage. All funds committed to such a trading strategy should be purely risk capital. © AQR Capital Management, LLC. All rights reserved.

(continued from page 4)

transparent idea, it's about building portfolios that seek to capture clear and economically intuitive ideas," he says. "Because these are systematic sources of return, versus idiosyncratic, they should come at a fairer fee than active management."

### Index and Portfolio Construction

Smart beta strategies can still leverage a single factor, but because they're generally not correlated to one another, when combined, the diversification helps to drive higher risk-adjusted returns over time and eliminates issues of timing and market cycles. "We did see outflows in value-tilted strategies," says Blake, which is not surprising given the current market environment. "It's not the best time to sell when at a low," she says. Long term, the value factor has experienced excellent excess performance, but to achieve it, an investor needs to be in for the long haul. "We encourage our clients to stick through the tough periods," she says.

Any portfolio manager would acknowledge that timing factors in the short run is nearly impossible, just as market timing is nearly impossible. There certainly are periods when factor pricing and valuations relative to historical numbers can be an indication—although not a prediction—of when to buy and when to sell," says Blake. Low volatility stocks, for example, look a little expensive in the current volatile market, and quality stocks look a little cheap. Factors like momentum, size and value look well-priced. "That's one element to building top-down strategies that try to give exposure across many factors," she says. "The idea is to create diversified portfolios across factors with a long-term horizon to capture any sort of associated risk premia, because timing is so challenging."

There are different techniques used to build them. Factors can be equal-weighted, against low volatility, low valuation and high quality, for example, as in SSGA's multi-factor SPDR MSCI Quality Mix ETFs. SSGA also uses a proprietary strategy that evaluates stocks across three factors, tilting toward those that have the highest scores while underweighting those with the lowest. In December 2015, SSGA launched three Russell 1000 Focus factor funds developed with the Alaska Permanent Fund. "It was a collaborative process," says Blake. All three of the multi-factor ETFs have the same diversified base exposure, which is a combination of value, quality and size, but each has an additional factor overlay of yield for income generation, volatility for drawdown protection, and momentum for growth. "Investors can trade among the three US equity multifactor strategy depending on their objectives and the market cycle," she says.

### Methodologies

Once the methodology is determined, an index does not have any judgment that goes into its construction or how it evolves over time. "It's actually perceived as a positive if a smart beta strategy stays static and the rules never change and if it is completely transparent," says Berger. But moving away from that paradigm by having some flexibility to adjust and allow the rules to evolve over time can result in more durable portfolios. "In most cases, an index is fine for a strictly passive portfolio, but as soon as it's active—as smart beta is—a lot of those index characteristics can actually hurt you," he says.

"In the case of low volatility, there's a very good reason we don't pursue the basic minimum variance approach," says McCarthy. There are a number of minimum variance strategies that seek to build

### ESTIMATED NET FLOWS

| Strategic Beta/Other Fund*      | 2011                    | 2012                    | 2013                    | 2014                    | 2015                    |
|---------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Strategic Beta, Return-Oriented | \$24,026,271,862        | \$25,645,462,692        | \$62,376,042,925        | \$58,664,830,649        | \$57,302,068,529        |
| Strategic Beta, Risk-Oriented   | \$984,020,493           | \$4,758,736,113         | \$5,158,999,262         | \$2,065,748,872         | \$10,679,438,336        |
| Strategic Beta, Other           | (\$862,723,923)         | \$4,127,433,254         | \$2,359,064,316         | \$7,340,974,413         | \$4,936,970,006         |
| <b>Strategic Beta, Total</b>    | <b>\$24,147,568,432</b> | <b>\$34,531,632,059</b> | <b>\$69,894,106,503</b> | <b>\$68,071,553,934</b> | <b>\$72,918,476,871</b> |

Source: Morningstar. \*Strategic Beta/Other Fund: Strategic Beta, Return-Oriented, Strategic Beta, Risk-Oriented, Strategic Beta, Other.

the lowest beta portfolio possible, which gives rise to a beta exposure that moves around through time and can contain unintended risk, such as regional, sector and security concentration risks, for example. “Very importantly, it misses the point that the low volatility anomaly itself is actually more of a high volatility phenomenon,” he says. Avoiding the highest volatility stocks is just as important, if not more so, than selecting those with the lowest volatility. “Rather than building a portfolio that seeks the lowest beta stocks regardless of fundamental attractiveness and taking on unwarranted sector, liquidity and crowding risks, we target a constant portfolio beta of 0.75, and use our alpha models to find the most attractive stocks within a broad low volatility stock universe. This allows us to build low volatility portfolios with attractive fundamentals that have produced very sound risk-adjusted returns,” he says.

“There’s considerable subjectivity embedded in the methods used by smart beta developers, so this is not a passive exercise” says McCarthy. There are a lot of decisions being made on the front end in terms of factor definition, portfolio construction and rules around rebalancing. “All these things require practitioner judgments at the outset, and the choices, and ultimate returns, will therefore vary greatly by provider,” he says. “We have many discussions with clients about creating custom blends of factors. For clients seeking particular factor exposures, we are able to customize portfolios to include those exposures with an awareness of the markets in which they are expressed,” says Berger. “There is a lot of potential there.”

“These ideas are intuitive, they are well understood by definition and they are simple in most respects, but the craftsmanship is where you can

really differentiate a good long-term source of return or not,” says Israel. “We spend a tremendous amount of time focusing on implementation—how do we take these ideas and translate them into the most effective portfolios possible.” That starts with defining exactly what will be captured with a focus on diversifying multiple styles and multiple asset classes, when possible, versus just one, then integrating those elements into one portfolio. “We take these ideas and try to diversify them with each other and across different dimensions in portfolio construction, because we believe this leads to more effective versions of factor and style premia strategies,” he says. Risk management is a large element as well, especially in the long/short versions of these strategies. “You might need what we jokingly refer to as LSD—leverage, shorting and derivatives,” he says. “There may be a need to use them as tools to accomplish a strategy’s objectives, and they’re effective tools, but ones that need to be carefully managed.” There is also a focus on trading, particularly in ways that lowers the cost of implementation and that extracts as much of the return as possible. “In many ways, this is what separates something that looks good on paper versus something that looks good in an investor’s portfolio,” he says.

### Strategies for Current Markets

“Since early December, we’ve seen a flight from momentum and a real factor rotation,” says Draper. For example, the spread between momentum and value was at its widest going into the fourth quarter of 2015. “That was largely encouraged by loose monetary policy in most of the developed world,” he says. Also, the technology, biotech, healthcare and other high-growth sectors, represented by momentum, have had a great multi-year run. “We’ve



Conor McCarthy  
Wellington Management

**“There has definitely been more interest and increased adoption.”**

### U.S. NET ASSETS

| Strategic Beta/Other Fund*      | 12/11                    | 12/12                    | 12/13                    | 12/14                    | 12/15                    |
|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Strategic Beta, Return-Oriented | \$181,806,213,099        | \$232,269,833,194        | \$367,980,403,330        | \$457,444,019,231        | \$496,981,829,350        |
| Strategic Beta, Risk-Oriented   | \$1,069,094,349          | \$6,001,416,586          | \$12,458,158,680         | \$15,513,105,512         | \$25,925,430,682         |
| Strategic Beta, Other           | \$27,065,920,975         | \$32,941,659,526         | \$38,917,723,675         | \$44,495,352,666         | \$43,403,652,208         |
| <b>Strategic Beta, Total</b>    | <b>\$209,941,228,423</b> | <b>\$271,212,909,306</b> | <b>\$419,356,285,685</b> | <b>\$517,452,477,409</b> | <b>\$566,310,912,240</b> |

Source: Morningstar. \*Strategic Beta/Other Fund: Strategic Beta, Return-Oriented, Strategic Beta, Risk-Oriented, Strategic Beta, Other.





Ronen Israel  
AQR Capital Mgt

**“We definitely see increasing interest, pretty much across the board.”**

seen large flows rotate from various momentum strategies, mostly moving into low volatility and quality,” he says. “We have yet to see a movement into value, and we’re expecting to see renewed interest at some point.” Investors are still looking closely at balance-sheet and earnings quality, even though valuations look good on a relative return basis. “Until we see that movement into value, it does seem that low volatility and quality are the points of destination right now,” he says.

“In what many believe will be a low return world going forward, many investors are focused on absolute return strategies that can deploy alternative risk premia along with sources of alpha,” says McCarthy. Many asset owners with exposures to hedge funds are looking for substitutes—or, more often, complements—to those they already use, with a different degree of liquidity, transparency, and fee structure, especially if they’re looking to scale up the programs. “Having strategies that use alternative beta as the core and have similar diversification and risk-return profiles as hedge funds is attractive to those wanting to do more on the alternative side but wrestling with some of the challenges. Our ALTA strategy, for example, addresses this very need,” says Berger.

### Innovations

Traditional bond indices are often weighted by the size of debt issuance, with the most indebted countries representing the largest index exposures. An example is Japan, which represents 28 percent of the World Government Bond Index and is paying zero to negative yields on the 10-year. “In that context, is a 28 percent allocation ideal?” asks McCarthy.

Wellington Management’s Global Strategic Sovereign strategy combines a subset of healthy sovereign exposures that are risk weighted to target a better risk-return profile. First, by independently evaluating key factors like the credit profile and potential change for each sovereign, relative valuation, and liquidity, a subset of eight to 15 countries emerges. “We then combine this perspective in a more risk-weighted construction, providing what we view as a better market exposure” says McCarthy. “We’re not just simplistically saying, ‘Okay, here’s the sovereign universe, we’re going to cast the weightings of the various constituents in a way that is more risk weighted,’ which is one approach you could take.”

“There’s value in using risk weight, but the challenge is to get a risk estimate for these countries,” says Berger. One way is to assess the volatility of the markets historically, but that approach may miss forward-looking risks or opportunities in a particular country’s debt that’s not reflected in its recent performance. Without that oversight, it’s like the computer programming notion of “garbage in-garbage out”. “If you’re starting with data that’s missing some fundamental risk, you’re going to end up with a very skewed portfolio,” Berger says. “So that’s where our insight comes in—we’re not simply risk-weighting everything, we’re evaluating the countries according to what we think is an accurate measure of the risk and building a portfolio from there.”

In October 2015, PowerShares launched five Tactical Sector Rotation Portfolio ETFs, based on Dorsey, Wright & Associates’ indexing methodology for sector selection and weighting. “The innovation was to offer dynamic asset allocation within an ETF, and we also added a cash component that enables higher volatility sector weights to move to cash if necessary for better downside risk management,” says Draper. “Not only are you getting those different sectors which have momentum, but you’re also receiving a risk premium through the rebalance.” This is done through DWA’s methodology, in a tax-efficient ETF wrapper.

“We would make an unconditional, long-term argument that these things should be part of an investor’s portfolio,” says Israel. One could also make a conditional argument that the need for diversifying sources of return may be even more important in a world with lower prospective returns in traditional asset classes and where increased volatility is likely. “The need for strategies that diversify away from traditional asset class exposure may be even more important, and people are responding to that,” he says. “They are looking at their portfolios and thinking about reducing some of that traditional asset class exposure by putting on uncorrelated sources of returns—ones they think are intuitive, have long-term persistence and can be captured at a fair fee.”

“Each time we apply the idea of style premia in various markets, we find that the investment thesis holds up, which is a nice out-of-sample test, and it gives us more confidence that these are truly persistent sources of return,” says Israel. ■