As investors seek to increase returns in today’s low-yield environment, some are discovering that Smart Beta may be an avenue to grow portfolios while potentially limiting additional fees and risks. Here we present case studies describing how investors seek to use Smart Beta to:

- Strengthen passive portfolio
- Foster an alternative to active management
- Improve portfolio mix and risk profile
- Seek specific fixed-income exposures
In recent years, passive portfolios built using methodologies other than market cap-weighting have emerged. These new strategies have provided investors with the opportunity to improve performance potential over traditional indexing portfolios without paying the fees associated with active management.

In equity markets, these portfolios are primarily constructed to capture premia associated with well-known factors, such as value, size, quality, low volatility and momentum. In fixed income, these portfolios are largely built around traditional sources of premia ie. Credit premium, term premium and liquidity. We refer to these alternatively weighted or factor-based portfolios as Smart Beta.

Smart Beta offers a blend of passive and active investing, thus creating a third approach to investing. It involves active performance within a relatively low cost, passive-like vehicle structure. Performance benefits include the potential for higher returns, improved downside protection and better overall risk-adjusted performance. The opportunity to capture these benefits in a portfolio that retains many of the advantages — transparency, consistency and predictability — that investors value in traditional passive investing is compelling.

The following pages share ways that our clients have implemented Smart Beta strategies to improve their portfolios. Our observations suggest that investors who closely align factor and strategy selection with their beliefs and performance goals, invest in strategies that they fully understand and form reasonable expectations of performance over an appropriate investment horizon are best positioned to have a successful experience with Smart Beta strategies.
Strengthen Passive Equity Portfolio by Capturing Value and Low Volatility Factors

**Investor Profile**
- $20 billion US sovereign wealth fund
- Implemented Smart Beta to improve the performance potential of their passive US large-cap equity portfolio and keep management fees low

**Scenario**
This plan sponsor conducts a thorough asset class review annually, using a cyclical rotating approach that ensures each asset class is reviewed every five years. The primary objective of this review process is to identify whether they would like to continue having an allocation to the asset class, and if so, what strategies they would like to employ for this part of the portfolio.

Recently, the review focused on the investor's US large-cap equity portfolio. At the time of the review, this $2.3 billion portfolio was invested in a passive S&P 500 Index strategy (Figure 1). Once the investment staff and board decided that they would maintain exposure to this asset class, they explored various ways to invest these assets, considering both passive and active management.

The staff solicited ideas from a broad range of asset managers, using this process as an opportunity to learn about market-wide strategy developments, including Smart Beta. During this research stage, which spanned several months, the investment staff provided periodic updates to board members, sharing the various ideas in an effort both to keep them informed of progress as well as improve their investment acumen.

The plan sponsor, with the help of a consultant, ultimately concluded that they would retain a passive approach to their US large-cap equity portfolio, but would diversify their existing allocation by investing a portion of the assets in Smart Beta strategies.

**Factor Selection and Rationale**
The investor wished to capture value and low volatility factor premia with its Smart Beta allocations.

Factor selection was based on the following:
- The investor’s belief in the investment thesis and intuition of these factors
- The performance expectations of these factors were aligned with their goal of delivering at least the same return as the cap-weighted benchmark, but with lower volatility

**Strategy Selection**
To achieve the objective, the investor moved from an S&P 500 Index Strategy to allocations of:
- 70% Russell 3000 Index Strategy
- 23% FTSE RAFI US 1000 Index Strategy (Smart Beta: value exposure)
- 7% MSCI USA Minimum Volatility Index Strategy (Smart Beta: low volatility exposure)

**Performance Evaluation**
The investor revised its investment policy statement to incorporate these new indices, and performance evaluation of this implementation is focused on the effectiveness of State Street Global Advisors (SSGA) at tracking the returns of the individual indices. With respect to evaluating the decision to move to these new indices, they are using a multi-year investment horizon and thus are not concerned about any periods of interim underperformance relative to the initial portfolio.

1 As of May 31, 2015.
Case Study | Smart Beta Client Experiences

**Alternative to Active Management at a Lower Fee Structure**

**Investor Profile**
- $2 billion US nonprofit organization
- Analyzed the risk exposures of its active equity portfolio, which lead to the consideration of a Smart Beta strategy to increase active risk and improve flexibility at lower cost

**Scenario**
Depending upon the allocation structure, portfolios that utilize multiple active strategies may encounter unappealing side effects from over-diversification. While an active strategy may demonstrate high tracking error or active share on a stand-alone basis, adding other diversifying strategies to the mix may lead to an overall portfolio that is costly and has relatively low active risk. Further, this low tracking error may be largely explained by a small number of common risk factors. Investors should understand overall portfolio-level risk exposures, particularly if they are utilizing higher cost active managers.

A US nonprofit organization recently asked SSGA to conduct a risk-based analysis of its foundation’s public equity portfolio. This investor has a preference for active management and thus has a range of active strategies within its portfolio. We evaluated the investor’s portfolio-level holdings as of December 31, 2014, using the MSCI All Country World Index as the benchmark. See Figures 2 and 3 for summary statistics of this analysis.

**Notable Observations**
- The overall active risk of the portfolio is 1.05 percent. We believe this is a low level of active risk for an active portfolio
- Of that risk, factor risk accounts for what we believe to be a high amount of active risk (67 percent). Stock-specific risk is low (33 percent)
- The portfolio has a large exposure to small-cap stocks. It also has exposure to higher volatility stocks and a negative exposure to value equities, meaning that it tilts towards expensive stocks
Next Steps/SSGA Recommendations

Our analysis suggests that the investor’s aggregate portfolio has low tracking error, which may be undesirable relative to the high active risk and management fees associated with each of the underlying strategies. Additionally, a large portion of this aggregate portfolio’s active risk is explained by factor risk. Certain desirable risk factor exposures, such as an overweight to small caps, can be captured more cost-effectively with a Smart Beta portfolio. Replicating this analysis using other historical dates can provide insights as to the persistence of these exposures, as would complementing this work with a returns-based analysis.

We recommended that the investor investigate alternative ways to design its equity portfolio in a manner that retains active management while also improving flexibility and transparency and reducing costs. For example, the number of active managers may be reduced to mitigate over-diversification. Further, a portion of this active portfolio may be reallocated to Smart Beta strategies that provide certain desirable factor exposures that may not be reflected in the portfolio of active managers, such as value and low volatility. This structural design allows for potentially higher active risk, greater flexibility, more control and simplicity.

Figure 2: Analysis of Investor’s Equity Portfolio

Risk Statistics

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio Total Risk (%)</td>
<td>9.18</td>
</tr>
<tr>
<td>Benchmark Total Risk (%)</td>
<td>9.33</td>
</tr>
<tr>
<td>Beta</td>
<td>0.98</td>
</tr>
<tr>
<td>Active Risk</td>
<td>1.05</td>
</tr>
<tr>
<td>Factor Risk (%)</td>
<td>67</td>
</tr>
<tr>
<td>Specific Risk (%)</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: SSGA, Axioma, as of September 30, 2014.

Figure 3: Analysis of Investor’s Equity Portfolio

Active Style Factor Exposures

<table>
<thead>
<tr>
<th>Factor Exposure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
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<tr>
<td>Short-Term Momentum</td>
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<tr>
<td>Exchange Rate Sensitivity</td>
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</tr>
<tr>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Liquidity</td>
<td></td>
</tr>
<tr>
<td>Medium-Term Momentum</td>
<td></td>
</tr>
<tr>
<td>Volatility</td>
<td></td>
</tr>
</tbody>
</table>

Source: SSGA, Axioma, as of September 30, 2014.

Factor Exposures are as of the date indicated, are subject to change, and should not be relied upon as current thereafter.

\(^2\) As of December 31, 2014.
Case Study | Smart Beta Client Experiences

Improve Portfolio Diversification While Maintaining Risk Profile and Fee Structure

Investor Profile
• $4 billion US corporate defined contribution plan
• Implemented Smart Beta to replace portions of their active and passive equity strategies with the goal of improving performance potential without a material increase in management fees

Scenario
The equity component of this DC plan is structured using a variety of “white label” funds, or non-branded multi-manager funds, that provide participants with exposure to various equity market segments around the globe. For example, this plan offers US large-cap, US small-cap and international all-cap equity funds. The plan sponsor, with the help of its consultant, creates the allocation strategies for each of these funds. They recently worked on a project focused on improving each fund and identified the following goals:
• Retain active performance potential
• Maintain or reduce expected volatility
• Retain similar levels of active share
• Retain high conviction active strategies
• Potentially reduce management fees and manager monitoring requirements

In the initial stages of this project, the plan sponsor’s consultant introduced the concept of Smart Beta investing and its potential benefits to the investor. These discussions eventually evolved into research that examined the most compelling and durable Smart Beta equity factors as well as the various types of indices and strategies in the marketplace. Based on this research, the investor decided that Smart Beta would play a prominent role in the funds going forward.

From a factor selection standpoint, the investor was most interested in targeting defensive-oriented factors. However, they did not wish to invest in a single low volatility strategy, as they were not comfortable with the sector biases present in many of the offerings reviewed. Instead, they wanted a multi-factor defensive Smart Beta strategy that had better diversification properties. The investor particularly liked the idea of a strategy that favored higher quality companies.

Factor Selection and Rationale
The investor wished to capture quality and low volatility factor premia with its Smart Beta allocations.

Factor selection was based on the following:
• The investor’s belief in the investment thesis and intuition of these factors
• The performance expectations of these factors were aligned with their goal of adding more defensive, volatility-reducing portfolio exposures

Strategy Selection
The investor selected SSGA High Quality Low Volatility Strategies (a rules-based, SSGA’s suite of Smart Beta strategies that specifically target quality and low volatility factors) because of their:
• Ability to deliver the targeted factor exposures predictably and consistently
• High transparency in the investment process; it’s also easy to understand and explain
• Lower management fees relative to more active factor-based defensive strategies

After modeling various potential allocations to the strategy within each of the equity funds under review, the investor decided to invest 25 percent in the Smart Beta strategy for each fund. In certain funds, the decision was to replace a portion of the traditional passive allocation to improve the performance profile. In one fund, the investor replaced portions of active allocations to reduce management fees and manager monitoring resources but retain active performance potential. Figures 4 and 5 illustrate examples of these changes.
Performance Evaluation
A key objective in the allocation changes was to improve the performance outcome of each of the funds. As a result, the plan sponsor is concentrating its performance evaluation at the fund level, where the benchmarks remain the respective market-cap weighted indices. The underlying strategies in each fund will be monitored over time for both their individual performance and their contributions to the overall performance at the fund level. Given the lower beta profile of the SSGA US Small Cap High Volatility Low Quality Low Volatility, the client understands that its attractive downside protection comes at the expense of lower upside capture at times. However, the investor desires this profile as it complements other higher volatility allocations in the fund.

4 As of December 31, 2014.
Case Study | Smart Beta Client Experiences

Improve Performance Potential of Fixed-Income Assets for DB Matching While Preserving Credit Constraints

Investor Profile
- Well-funded US defined benefit (DB) pension scheme
- Due to the regulatory environment, the plan faced investment policy constraints with respect to credit ratings
- Implemented Smart Beta fixed income approach to improve the performance potential of a portfolio designated to match assets and liabilities (a matching portfolio), which was primarily invested in US corporate bonds

Scenario
A well-funded US DB scheme with 85% in matching assets and 15% in growth assets approached SSGA to help redesign their fixed-income investment strategy.

The plan's funding status was highly dependent on credit spread. As a result, the plan's board wished to explore ways to improve the performance on their assets relative to their liabilities, without jeopardising their well-funded status. For regulatory reasons, credit ratings were explicitly constrained in the plan's investment policy. The plan was already well-funded. Therefore, the investor did not want to materially deviate from the core universe of investment grade corporate bonds or employ a strategy that could expose them to significant short-fall risk.

SSGA’s smart beta fixed income team tailored a corporate bond strategy designed to extract the credit risk premium to fit the investor’s specific requirements. The strategy is applied only A-rated names from the investment grade bond universe, and targeted 5 to 20 year securities. The team applied the Smart Beta approach to this subset while maintaining the duration target and credit constraints of the plan.

In general, Smart Beta quantifies the portion of the credit risk premium related to default risk for each issuer. The strategy then compares each issuer’s fair value spread (FVS) based on its fundamentals and probability of default, with the current spread in the market. This way, the strategy can identify bonds where default risk is mispriced relative to fundamentals, and can create a credit portfolio tilted towards bonds priced most cheaply relative to fundamental risk.

Quality-tilted portfolios typically tilt towards the 50 to 100 most attractive bonds in the universe with the overweight being funded from the rest of the portfolio on a pro-rated basis.

Factor Selection and Rationale
The investor appreciated that the portfolio’s excess return potential founded on a quantitative estimation of credit risk (default probability), as well as on a market-based estimation of value. The combination of these factors in the methodology provided comfort that the systematic, Smart Beta could deliver upside potential while not exposing the matching portfolio to undue short-fall risk.

We selected the factors quality and value based on the following:
- The investor’s belief in the intuition behind the quality and value factors to capture the mispricing of credit risk.
- The performance expectations of these factors aligned with the investor’s goal to improve return potential while continuing to match assets and liabilities.
**Notable Observations**
Waiting on perf data to 30-June.

**Next Steps/SSGA Recommendations**
The SSGA Smart Beta Corporate approach is a flexible approach that can be applied to most credit sectors and benchmarks. While the approach determines its own estimates of credit quality for each issuer, the methodology can be applied in conjunction with standard issuer credit ratings that are typically referenced in clients’ investment guidelines. For example, the approach could also include parameters that the portfolio is 20% A-rated, or 10% BBB-rated.

In this example SSGA worked very closely with the DB Pension scheme to design and implement the Smart Beta methodology to meet its specific investment goals and guidelines. The flexibility of the approach and the intuition of the quality and value factors allow for significant opportunities to apply this strategy for other investors across the corporate bond universe.

![Figure 6: Corporate Bond Issuers](image)
Ranked by Reward for Inherent Default Risk

Source: SSGA, as of August 31, 2014.
Allocations are as of the date indicated, are subject to change, and should not be relied upon as current thereafter.
Glossary

Active Risk  A type of risk that a fund or managed portfolio creates as it attempts to beat the returns of the benchmark against which it is compared.

Benchmark Total Risk  A measure of looking at all the different risks that could be involved that would affect the potential returns on the mutual fund by comparing it to the benchmark, (a standard such as NASDAQ) with which it is to be compared.

Beta  Measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole.

Credit Risk Premium  The return in excess of the risk-free of return that an investment is expected to yield.

Default Risk  The event in which companies or individuals will be unable to make the required payments on their debt obligations.

Factor Risk  Any risk, especially a macroeconomic situation, that may affect an asset or investment. Examples include inflation and interest rates.

Fair Value Spread (FVS)  The estimated value of all assets and liabilities of an acquired company used to consolidate the financial statements of both companies.

FTSE RAFI US 1000 Index  An index of stocks based on the largest 1,000 fundamentally ranked companies.

Fundamentals  The qualitative and quantitative information that contributes to the economic well-being and the subsequent financial valuation of a company, security or currency.

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MSCI All Country World Index  A market capitalization weighted index designed to provide a broad measure of equity-market performance throughout the world. It is maintained by Morgan Stanley Capital International and is comprised of stocks from both developed and emerging markets.

MSCI USA Minimum Volatility Index  An index that aims to reflect the performance characteristics of a minimum variance strategy applied to the US large and mid cap equity universe.

Portfolio Total Risk  Portfolio risk means how likely it is that a collection of financial assets will lose value. As a general rule, the riskier the assets, the higher the potential losses and gains. Quantifying risk allows investors to build a portfolio that suits their tolerance for loss, while trying to maximize gains.

Russell 3000 Index  A market capitalization weighted equity index maintained by the Russell Investment Group that seeks to be a benchmark of the entire US stock market.

S&P 500 Index  An American stock market index based on the market capitalization of 500 large companies having common stock listed on the NYSE or NASDAQ.

Short Fall Risk  The risk of falling short of any investment target.

Small-cap Stocks  Refers to stocks with relatively small market capitalization; between $300 million and $2 billion.

Smart Beta  A set of investment strategies that emphasize the use of alternative index construction rules to traditional market capitalization based indices.

Specific Risk  Risk that affects a very small number of assets. It relates to risks that are very specific to a company or small group of companies. This type of risk would be the opposite of an overall market risk, or systematic risk.

Tracking Error  A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark.

US Corporate Bonds  A bond issued by a corporation in order to raise financing for a variety of reasons such as to ongoing operations, M&A, or to expand business.

US Corporate Defined Contribution Plan  A type of retirement plan in which the employer, employee or both make contributions on a regular basis.

US Defined Benefit Pension Scheme  A type of pension plan in which an employer/sponsor promises a specified monthly benefit on retirement that is predetermined by a formula based on the employee’s earning history, tenure of service and age, rather than depending directly on individual investment returns.

US Large-cap Equity  A term used to refer to companies with a market capitalization value of more than $10 billion.

Value Equities  The value of the company’s shares and loans that the shareholders have made available to the business. It is calculated by taking enterprise value, adding redundant assets, and then subtracting debt net of cash available.
About Us
For nearly four decades, State Street Global Advisors has been committed to helping our clients, and those who rely on them, achieve financial security. We partner with many of the world’s largest, most sophisticated investors and financial intermediaries to help them reach their goals through a rigorous, research-driven investment process spanning both indexing and active disciplines. With trillions* in assets, our scale and global reach offer clients access to markets, geographies and asset classes, and allow us to deliver thoughtful insights and innovative solutions.

State Street Global Advisors is the investment management arm of State Street Corporation.

* Assets under management were $2.24 trillion as of December 31, 2015. AUM reflects approx. $22.0 billion (as of December 31, 2015) with respect to which State Street Global Markets, LLC (SSGM) serves as marketing agent; SSGM and State Street Global Advisors are affiliated.

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State Street Global Advisors Worldwide Entities


Our Smart Beta Capabilities
With over 20 years of experience managing Smart Beta portfolios, and nearly $90 billion¹ in Smart Beta assets under management, State Street Global Advisors is an industry leader in Smart Beta solutions and research, and ultimately a trusted partner for our clients.

¹ As of March 31, 2015.
Case Study  |  Smart Beta Client Experiences

This document provides summary information regarding the Strategy. This document should be read in conjunction with the Strategy's Disclosure Document, which is available from SSGA. The Strategy Disclosure Document contains important information about the Strategy, including a description of a number of risks.

Although subject to the risks of common stocks, low volatility stocks are seen as having a lower risk profile than the overall market. However, a portfolio comprised of low volatility stocks may not produce investment exposure that has lower variability to changes in such stocks’ price levels.

Value stocks can perform differently from the market as a whole. They can remain undervalued by the market for long periods of time.

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Bonds generally present less short-term risk and volatility than stocks, but contain interest rate risk (as interest rates raise, bond prices usually fall); issuer default risk; issuer credit risk; liquidity risk; and inflation risk. These effects are usually pronounced for longer-term securities. Any fixed income security sold or redeemed prior to maturity may be subject to a substantial gain or loss.

Government bonds and corporate bonds generally have more moderate short-term price fluctuations than stocks, but provide lower potential long-term returns.

SSGA does not yet manage actual assets to this strategy. A complete list of the firm’s composites and their descriptions is available upon request.

Investing involves risk including the risk of loss of principal.