PAX Pax World Investments | For Tomorrow®

ESG – Expanding the Horizon of Smart Beta

by Steve Falci, CFA®, Chief Investment Officer
David Loehwing, Director, Sustainability Research

Smart beta and Environmental, Social and Governance (ESG) integration have both gathered strong momentum, with significant asset growth in strategies using each discipline. We believe that there is significant opportunity at the intersection of these two trends. Multifactor smart beta strategies, with their longer-term focus and factor diversification, provide a natural platform for the integration of ESG. The ability to systematize original ESG research and data with a focus on risk and materiality provides the opportunity to create a robust ESG score that has the potential to bring an additional source of diversification and risk control to multifactor smart beta strategies. Integrating a robust ESG score with multiple time-tested factors can provide investors with a unique, strong alternative in the smart beta arena.

Two Converging Trends

Smart beta, also known as strategic beta and factor investing, continues to capture the attention of investors as a transparent, lower cost investment approach with the potential to deliver excess returns above those of traditional market capitalization weighted indices. Supported by academic and practitioner research, these strategies focus on factors that have demonstrated the ability to add value over market cycles.[1] As of June 30, 2016, Morningstar estimated that $490 billion was invested in smart beta strategies in the US.[2] The *Financial Times* reported that in the first quarter of 2017 smart beta funds continued to grow, attracting $24 billion in new money, nearly half the $57 billion raised in all of 2016.[3]

Initially focused primarily on single factors, smart beta strategies incorporating multiple factors, are now gaining significant traction. Morningstar estimates that there are almost 200 multifactor smart beta exchange traded funds (ETFs) with assets of $36 billion, and more than one-third of the 200 were launched in the last year.[4] In their recent survey of asset owners on smart beta, FTSE Russell notes "the headline trend belongs to multifactor combinations: 64% of respondents who are currently implementing a smart beta index are using a multifactor strategy. That is more than triple the rate in the 2015 survey."[5]

Similarly, integrating ESG issues into investment analysis and portfolio construction has gained significant traction in recent years. The growing interest in sustainable investing has been spurred

CONTINUED

by research that suggests ESG factors can contribute to better investment decisions (see below). US SIF, The Forum for Sustainable and Responsible Investment, estimates that assets managed in the U.S. that incorporate ESG in some fashion have grown from a little over $2 trillion in 2005 to approximately $8.1 trillion in 2016.[6]

At the intersection of these two trends, we believe there is a significant opportunity to further improve investment outcomes. Multifactor smart beta strategies are diversified and focus on longer-term investment horizons. They provide exposure to multiple drivers of return, in contrast to single factor smart beta strategies that are more narrowly focused and often used to gain shorter-term, tactical exposures. Similarly, one of the defining tenets of ESG integration is its investment materiality over the long term.

While ESG integration has received more traction in fundamental analysis, the increased ability to quantify ESG metrics through improving sources of data and systematic modeling of fundamental ESG research can lead to the creation of robust quantitative ESG scores.

We believe a well-constructed ESG score can buttress a sound multifactor smart beta strategy with an additional element of diversification and risk control and provide investors with a strong, unique option in the smart beta marketplace.

"We believe a well-constructed ESG score can buttress a sound multifactor smart beta strategy with an additional element of diversification and risk control."

Evolution of Smart Beta

Smart beta refers to systematic strategies that weight securities based on fundamental factor(s)—rather than market cap—that have demonstrated the capacity to add value over the long term. This investment approach is an increasingly popular and attractive hybrid between active and passive management that brings some of the advantages of passive management as well as some of the advantages of market-tested factors or fundamental weightings vs. pure market capitalization weighted indices.

Smart beta strategies aim to exploit long-established anomalies in investment factors that have demonstrated the ability to add long-term value above market indices. These factors generally fall into six broad categories:

- **Value**
- **Size**
- **Quality**
- **Momentum**
- **Low Volatility**
- **Dividend Yield**

These factors are rooted in sound investment theses and are supported by robust academic and practitioner research. Foremost in this body of research is the work of Eugene Fama and Kenneth French that first established the grounding for size and value factors in the early 1990s. More recently they have expanded their model explaining stock returns to include quality-related factors focused on firm profitability and investment.[1]

Initially, smart beta strategies consisted primarily of mutual funds and ETFs that weighted holdings based on one factor. These funds and ETFs provided investors with an alternative to market capitalization weighted indices and a vehicle to tactically manage exposure to a factor in a larger portfolio or asset class. While demonstrating the ability to deliver outperformance over longer time periods, they can have significant near-term deviation from market benchmarks.

CONTINUED

Factors can also become overvalued and can subject single factor strategies to significant periods of underperformance.

Multifactor smart beta strategies help address some of these challenges through:

- **Diversification.** Investing in a combination of factors provides diversified sources of return, lower tracking error, and potentially more consistent benchmark-relative returns. Through diversification, multifactor smart beta strategies can minimize the impact of a single factor being out of favor for a long period.

- **Rebalancing to target factor weights.** In addition to diversification, valuation risk can be managed through rebalancing. Rebalancing enables multifactor strategies to reduce exposure to factors that have outperformed and are moving toward full or overvaluation, while at the same time increasing weight to underperforming factors that are out of favor.

As sustainable investors, we believe a multifactor approach to smart beta provides the opportunity to create sound investment strategies based on a creative combination of fundamental factors. The longer-time horizon implied by multifactor strategies is in-line with the horizon of sustainable investors and differentiated from single factor smart beta ETFs, which are often used to manage tactical portfolio exposures. As such, we believe they provide a solid foundation for the addition of an ESG score or scores that can provide an additional source of information and diversification.

Evolution of ESG Integration

Integrating ESG factors into portfolios has evolved over the last 15 years. Initially, ESG considerations emphasized investor's values and were often incorporated into the investment process via exclusionary screens. More recently, sustainable investor focus has shifted to the materiality of ESG issues to a stock's risk and opportunities. Integrating ESG considerations in fundamental analysis has provided an additional lens for analysts and portfolio managers to view risk and opportunities in security selection.

While the natural parallels between fundamental financial and ESG analysis first accelerated the evolution of ESG integration in fundamental investment processes, the increase in the quantity and quality of sustainability disclosure and the availability of ESG data has more recently provided a foundation for the integration of ESG factors in systematic portfolios. An extensive body of research now supports the investment merits of including ESG in investment processes and provides guideposts to evaluate, quantify and rank stocks based on their ESG profiles. Quantitative rankings of company ESG profiles facilitates the incorporation of ESG in the optimization process for a smart beta strategy.

Broad performance studies have established a solid philosophical grounding for the merits of including ESG in investment decisions.

- The Morgan Stanley Institute for Sustainable Investing published a study in 2015 that reviewed the performance data for over 10,000 mutual funds and almost 2,900 separate accounts and concluded that sustainable investment funds "usually met and often exceeded the performance of comparable traditional investments" both on an absolute and risk-adjusted basis.[7]

CONTINUED

- Gunnar Friede et al reviewed 2,200 academic studies examining the relationship between ESG and corporate financial performance and found that approximately 90% of the studies report the relationship between ESG and corporate financial performance was positive or not negative.[8]

While the above-mentioned studies reinforce the basic premise for ESG integration, another set of studies provides specific guidance on *how* investors can systematically integrate ESG to build better portfolios. These studies provide important insights on the relationship between ESG issues and individual company performance in addition to ESG integration as a potential source of risk reduction:

ESG and company performance. Two studies by Harvard Business School professors have shed important light on ESG and company performance.

- A 2011 study by Eccles, Ioannou and Serafeim provides evidence, over a sample of 180 companies, that companies they defined as having "high sustainability" characteristics significantly outperformed lower sustainability companies over the long-term (study period 1993-2009), both in terms of investment performance and corporate financial metrics.[9]

- Serafeim, Kahn and Yoon, in their 2015 study, emphasize the importance of focusing on ESG factors that matter most or are *material* for a company. They found "that firms with good performance on material sustainability issues significantly outperform firms with poor performance on these issues."[10]

ESG and risk. There is a substantial set of research focused on the relationship between ESG and risk. The following two notable studies by investment managers provide direction on the benefits of ESG as a potential source of portfolio risk reduction.

- Michelle Clayman and Indrani De of New Amsterdam Partners demonstrated in a 2014 study that there was a strong negative correlation between ESG ratings and stock volatility, and excluding the worst ESG stocks from the investible universe tends to improve risk-adjusted returns.[11]

- AQR Capital Management's Jeff Dunn, Shaun Fitzgibbons and Lukasz Pomorski, in a 2017 paper, found that stocks with the worst ESG profiles have both total and stock specific volatility that is up to 10-15% higher than stocks with the best ESG profiles and that poor ESG profiles predict future statistical risks.[12]

These studies not only support the potential benefits of including an ESG factor rating in a multi-factor smart beta portfolio, they also inform the development of a robust ESG scoring process. It is our belief that seasoned fundamental sustainability analysts can apply their experiences to research and evaluate data and weight it based on materiality and risk to construct effective ESG ratings.

Constructing a Robust ESG Score

Over the last few years, Pax has developed an ESG rating framework, the Pax Sustainability Score (the Score), to quantitatively rank the ESG profiles of companies in the Russell 1000 Index,[13] allowing us to incorporate ESG information into factor-based portfolios. The Score is a proprietary ranking of companies' ESG profiles developed by Pax's Sustainability Research Team that combines multiple sources of third-party ESG data with original research and analysis. Importantly, the scoring framework is informed by key elements in the body of ESG research papers and shaped by the team's

CONTINUED

50 plus years of collective experience performing fundamental ESG research on how sustainability impacts a company's financial performance. The Score is designed to capture material information regarding a company's risk and performance potential. Key elements include:

- **Industry focus.** Companies are ranked relative to similar companies across industry groupings, providing a perspective on which companies are leaders and laggards given their similarities in business models and operating environments.
- **Focus on material ESG factors.** While there may be a broad array of ESG factors across the market, focusing on factors that are most material to ESG performance industry-by-industry and company-by-company allows the emphasis to be placed on those ESG factors that are most likely to be impactful to an individual company's financial performance.
- **Emphasis on management of ESG-related risks.** The factors and weights are focused on exposure to, and management of, material risks industry-by-industry. As our own experience and insights from research indicates, one of the stronger signals in ESG data is risk management or mitigation.
- **Involvement in ESG controversies.** Assessing the number, breadth and severity of ESG-related controversies at companies provides an additional lens on company risk. Controversies are a strong indication of potential limitations or ineffectiveness of a company's sustainability policies and programs.
- **ESG trajectory.** Adjusting a company's sustainability score upward if its ESG profile has been improving, and lowering the score if a company's profile has declined, can help add value. We incorporated this element into our scoring framework based on insights from MSCI's 2012 paper "Optimizing ESG Factors in Portfolio Construction" and 2015 paper "Can ESG Add Value?" These studies found that an ESG momentum strategy tended to deliver better risk-adjusted performance relative to other approaches that incorporate ESG information.[14]
- **Proprietary gender score:** Studies[15] have found that the presence of women in corporate leadership positions is positively correlated with measures of financial performance such as return on equity (ROE)[16] and return on invested capital (ROIC).[17] The gender factors and scoring framework used in the Pax Gender Leadership Score are incorporated into the Pax Sustainability Score. The Gender Leadership Score has had a positive impact on the performance of the **Pax Ellevate Global Women's Index Fund** since it was reorganized as an index fund in June of 2014.

"Integrating a proprietary ESG score with time tested financial factors can provide an opportunity for investors to gain unique beta exposure in their equity allocations."

Through our ESG-related advocacy and engagement and involvement in sustainable investing industry initiatives, we often gain insights into how ESG risks are evolving and how companies are responding to those challenges. When appropriate, we modify our scoring model to take these new issues into account.

Bringing it All Together: Integrating ESG into Multifactor Smart Beta Strategies

Integrating a proprietary ESG score with time tested financial factors can provide an opportunity for investors to gain unique beta exposure in their equity allocations. A multifactor smart beta strategy with ESG integration is meant to serve as a long-term investment strategy that

CONTINUED

combines diverse financial factor exposures with an additional element of diversification and risk mitigation derived from ESG factors.

For example, when we worked with our partner the Aperio Group to design our first multifactor smart beta fund, the **Pax ESG Beta Quality Fund**, we sought to construct a large cap core strategy that was consistent with key elements of our investment philosophy including investing in higher quality, lower risk companies that are attractively priced. Through research and back-testing we designed a strategy with an emphasis on four factors—Earnings Quality, Profitability, Beta and Earnings Yield. By overweighting these factors, the portfolio is designed to be invested in companies that, in aggregate, have more consistent earnings, higher quality earnings, are more profitable, have lower risk and are reasonably priced. With the addition of the Pax Sustainability Score, the portfolio also tilts toward companies that demonstrate ESG strength. We believe the Score provides another source of diversification and risk management.

Diversification

One way to evaluate the Score's potential as a diversifying factor is to consider its correlation to financial factors used in the multifactor strategy. Table 1 provides a point in time look at the correlation of the Pax Sustainability Score to Barra risk factors.[18] The low or negative correlation across the four factors (Earnings Quality, Profitability, Earnings Yield and Beta) in the Pax ESG Beta Quality Fund and the Pax Sustainability Score is a strong indication that integrating the ESG score provides an additional diversifying element to this multifactor strategy. Moreover, the low or negative correlations across all the Barra factors point to its potential as a diversifying element across a wide variety of multifactor strategies.

TABLE 1: Correlations of Barra Factors with Pax Sustainability Score

	Pax Sustainability Score
Beta	-0.04
Dividend Yield	0.11
Earnings Quality	0.12
Earnings Yield	0.07
Growth	-0.11
Leverage	-0.01
Liquidity	-0.01
Long Term Reversal	0.00
Management Quality	0.21
MidCap	-0.20
Momentum	0.05
Profitability	0.04
Prospect	-0.03
Residual Volatility	-0.08
Size	0.26
Value	-0.04

Represents factors included in Pax ESG Beta Quality Fund

Source: MSCI Barra, Aperio Group. As of 2/13/2017. Correlation values range from -1 and 1.[19]

CONTINUED

Risk reduction

There are also indications that the Pax Sustainability Score is a source of risk reduction. To examine this, we looked at 14 monthly observations of rankings since the Score's inception in early 2016. We segmented the ESG Scores into quintiles (top quintile represents companies with the best ESG profiles) and used the Barra Risk model to forecast risk for each quintile using two measures of risk: forecast total risk and predicted beta.

The results in Table 2 show that the top two quintiles, the stocks with the highest Scores, have the lowest forecast total risk and lowest predicted beta. Conversely, the bottom two quintiles demonstrated the highest risk on both measures.

TABLE 2: Risk measurements of Russell 1000 Index companies by Pax Sustainable Score quintiles over 14 month period.

Quintiles Pax Sustainability Score	% Absolute Total Risk	Portfolio Predicted Beta
Quintiles 1 (Best ESG)	18.46	0.96
Quintiles 2 (6 to 8 ESG)	17.31	0.98
Quintiles 3 (4 to 6 ESG)	19.49	1.01
Quintiles 4 (2 to 4 ESG)	20.73	1.04
Quintiles 5 (Poor ESG)	19.66	1.05

Lowest Risk
Highest Risk

Source: Barra, Pax World, Factset. Analysis based on average of 14 monthly observations from February 2016 to March 2017. Companies in the Russell 1000 Index are scored on a scale from 1-10 (10 is best).

While a limited sample size, these results are in-line with the academic and practitioner research that has shown ESG to be a source of risk reduction. Given that the Barra Risk model is used to forecast risk in the portfolio optimization process, the lower element of forecast risk embedded in the Score is incorporated in portfolio construction today. These results also support the strategy design decision to remove the higher risk, bottom quintile ESG stocks from the investable universe and optimize the portfolio to an aggregate Score of at least 7 out of 10.

Factor Investing Fueled by ESG

While still in the early stages, we firmly believe the future is bright for the intersection of ESG and smart beta. As integration of ESG scores evolve, we look forward to exploring in more depth how ESG may be incorporated as an explicit factor in risk models and more precisely attributing ESG's contribution to returns.

We are confident that multifactor strategies that are structured around a carefully selected mix of proven investment factors with an additional source of diversification and risk mitigation through the integration of a well-constructed, robust ESG score can provide investors with a unique, sound alternative to obtain smart beta exposure.

Pax ESG Beta Quality Fund
The Fund follows a multifactor-investing strategy focused on ESG, quality and value factors.
• Pax Sustainability Score • Profitability • Earnings Quality • Low Volatility • Earnings Yield

Pax ESG Beta Dividend Fund
The Fund follows a multifactor-investing strategy focused on ESG, dividend yield and dividend sustainability factors.
• Pax Sustainability Score • Dividend Yield • Earnings Quality • Profitability • Management Quality

Profitability is a combination of profitability measures that characterize the efficiency of a firm's operations and total activities.

Earnings Quality explains stock return differences due to uncertainty around company operating fundamentals (sales, earnings, cash flows) and the accrual components of their earnings.

Low Volatility explains common variations in stock returns due to different stock sensitivities to market or systematic risk that cannot be explained by the US Country factor.

Earnings Yield describes stock return differences due to various ratios of the company's earnings relative to its price.

Dividend Yield captures differences in stock returns attributable to stock's historical and predicted dividend-to-price ratios.

Management Quality captures common variation in stock returns of companies experiencing rapid growth or contraction of assets.

---

1 Eugene Fama and Kenneth French, "The Cross Section of Expected Stock Returns," *Journal of Finance*, June 1992.
Eugene Fama and Kenneth French, "A Five Factor Asset Pricing Model," *Journal of Financial Economics*, Volume 16, Issue 1, April 2015.

2 Morningstar, "A Global Guide to Strategic Beta Exchanged Traded Products," September 2016.

3 *Financial Times*, "2000% Rise in New Money Allocated to Smart Beta Funds," May 14, 2017.

4 Barron's, "Multifactor ETFs are Gaining in Popularity," July, 9 2016.

5 FTSE Russell, "Smart Beta: 2017 global survey findings form asset owners," May 2017.

6 US SIF, "Report on Sustainable and Responsible and Impact Trends Investing 2016."

7 Morgan Stanley Institute for Sustainable Investing, "Sustainable Reality: Understanding the Performance of Sustainable Investment Strategies," March 2015.

8 Gunnar Friede, Timo Busch, Alexander Bassen, "ESG and Financial Performance: Aggregated Evidence from More Than 2000 Empirical Studies," Journal of Sustainable Finance & Investment, October 2015.

9 Robert G. Eccles, Ioannis Ioannou and George Serafeim "The Impact of a Corporate Culture of Sustainability on Corporate Behavior and Performance" 2015.

10 Mozaffar Khan, George Serafeim and Aaron Yoon, "Corporate Sustainability: First Evidence on Materiality" 2015.

11 Indrani De and Michelle R. Clayman "The Benefits of Socially Responsible Investing: An Active Manager's Perspective," 2014.

12 Jeff Dunn, Shaun Fitzgibbons, and Lucasz Pomorski "Assessing Risk through Environmental, Social and Governance Exposures," 2017.

13 The Russell 1000 Index measures the performance of the 1,000 largest U.S. companies, as measured by market capitalization. It is a subset of the Russell 3000 Index, which measures the largest 3,000 companies. The Russell 1000 Index is comprised of over 90% of the total market capitalization of all listed U.S stocks. . One cannot invest directly in an index.

14 Zoltan Nagy, Doug Cogan, Dan Sinnerich, "Optimizing ESG Factors in Portfolio Construction," MSCI, December 2012.
Zoltan Nagy, Altaf Kassam, Linda-Eling Lee "Can ESG Add Value?", MSCI June 2015.

15 See, for example, Francesca Lagerberg, "The value of diversity," September 29, 2015, Grant Thornton; Morgan Stanley, "Why It Pays to Invest in Gender Diversity," n.d.; Corinne Post and Kris Byron, "Women on Boards and Firm Financial Performance: A Meta-Analysis," *Academy of Management Journal*, October 1, 2015; and the Credit Suisse Research Institute, "The CS Gender 3000: Women in Senior Management," 2014.

16 Return on Equity (ROE) is the amount of net income returned as a percentage of shareholders equity. REO measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

17 Return on invested capital (ROIC) is a profitability ratio. It measures the return that an investment generates for those who have provided capital, i.e. bondholders and stockholders. ROIC tells us how good a company is at turning capital into profits.

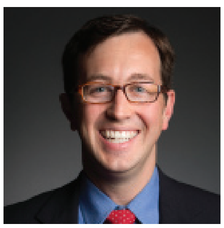
18 The Barra Risk Factor Analysis is a multi-factor model created by Barra Inc., which is used to measure the overall risk associated with a security relative to the market.

19 Correlation is a statistic that measures the degree to which two securities move in relation to each other. Correlation values range from -1 and 1. A perfect positive correlation of 1 implies that as one security moves, either up or down, the other security moves in lockstep, in the same direction. A perfect negative correlation means that two assets move in opposite directions, while a zero correlation implies no relationship at all.

Pax World Management LLC

Pax World Management LLC, investment adviser to Pax World Funds, is a pioneer in the field of sustainable investing. Pax World integrates environmental, social and governance (ESG) research into its investment process to better manage risk and deliver competitive long-term investment performance. For over 45 years, Pax World has made it possible for investors to align their investments with their values and have a positive social and environmental impact. Today, its platform of sustainable investing solutions includes a family of mutual funds, as well as separately managed accounts.

Steve Falci, CFA® is Chief Investment Officer at Pax World Management LLC where he oversees the investment management of Pax World Funds, the development of fund strategy and the collaboration between investment analysis and environmental, social and governance-based research to enhance the firm's sustainable investing strategy. Steve has 30 years of experience in investment management. Prior to joining Pax World, he served as Head of Strategy Development, Sustainable Investment at Kleinwort Benson Investors, where his duties included strategic direction, product development and identifying new market opportunities in the sustainable investment business. Steve previously served as Chief Investment Officer, Equities at Calvert Group and was a Principal and Senior Portfolio Manager at Mellon Equity Associates. Steve serves on the board of directors of the US Forum for Sustainable and Responsible Investment (US SIF). He also serves on the Investment Committee for Mercy Investment Services. Steve has a Bachelor's of Science in Economics and a Master's of Business Administration from the Stern School of Business at New York University and a Master's of Arts from Pittsburgh Theological Seminary. Steve is a CFA® charter holder.



David Loehwing, is Director of Sustainability Research at Pax World Management LLC. He is responsible for environmental, social, and governance-related research on prospective and current investments, and is involved in Pax World's efforts to promote sustainable business practices through stakeholder engagement. David is also a member of the Pax ESG Beta Quality Fund and the Pax ESG Beta Dividend Fund portfolio management team with a specific focus on the proprietary Pax Sustainability Score. He has been responsible for this aspect of the Fund since June 2016. David has worked in the sustainable investing field since 1998. Before joining Pax World, Mr. Loehwing served as Senior Social Research Analyst at Citizens Advisers, and as a Senior Account Manager at the Investor Responsibility Research Center (IRRC). He is also a former member of the Evangelical Lutheran Church in America (ELCA) Advisory Committee on Corporate Social Responsibility (ACCSR) and the Sustainable Investment Research Analyst Network's (SIRAN) steering committee. David is a graduate of Bowdoin College.

The statements and opinions expressed are those of the authors of this report. All information is historical and not indicative of future results and subject to change. This information is not a recommendation to buy or sell any security.

You should consider a fund's investment objectives, risks, and charges and expenses carefully before investing. For this and other important information, please obtain a fund prospectus by calling 800.767.1729 or visiting www.paxworld.com. Please read it carefully before investing. An investment in the Pax World Funds involves risk, including loss of principal.

Past performance is no guarantee of future results. Diversification does not eliminate the risk of experiencing investment loss.

RISK: Equity investments are subject to market fluctuations, the fund's share price can fall because of weakness in the broad market, a particular industry, or specific holdings. The Fund does not take defensive positions in declining markets. The Fund's performance would likely be adversely affected by a decline in the Index. Investments in emerging markets and non-U.S. securities are generally less liquid and less efficient than investments in developed markets and are subject to additional risks, such as risks of adverse governmental regulation, intervention and political developments. There is no guarantee that the objective will be met and diversification does not eliminate risk. The Pax ESG Beta Dividend Fund is new and has a limited operating history.

Effective June 30, 2016 the Pax Growth Fund (the "Predecessor Fund") was renamed the Pax ESG Beta Quality Fund (the Fund). The Predecessor Fund is treated as the survivor of the renaming for accounting and performance reporting purposes. Accordingly, all performance and other information shown for the Fund for periods prior to 6/30/2016 is that of the Predecessor Fund.

PAX
Pax World Investments

Pax World Investments
30 Penhallow Street, Suite 400
Portsmouth, NH 03801
800.372.7827
info@paxworld.com
www.paxworld.com