
White Paper

**Environmental, Social
& Governance (ESG)**

June 2020

ESG Index

Construction

A Tool to Build

Sustainable

Capital Markets

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Executive Summary

Investors are increasingly interested in incorporating environmental, social and governance (ESG) considerations into their portfolios — including in policy benchmarks. Yet the ongoing lack of ESG market infrastructure means that not all ESG indices are created equally. In this paper, we examine the Bloomberg SASB ESG Index family as a case study of key considerations facing investors interested in ESG indices.

We also look at R-Factor™, the ESG score that powers those indices. We found that companies that are strong on ESG issues tend to have lower risk than those that are weaker, and that the strongest performers on ESG were rewarded by investors during the period analyzed. When evaluating index construction options, we found that an optimized index designed appropriately has some advantages over indices that employ certain simple weighting or tilting schemes as the method of ESG incorporation, particularly for investors who have multiple objectives or constraints. Collectively, our findings build on emerging literature suggesting that it is possible for index investors to incorporate ESG without sacrificing performance.

Key Takeaways

- 1 The ongoing lack of market infrastructure in ESG poses challenges for investors seeking to incorporate sustainability into their portfolios.
- 2 Companies that are strong at managing ESG issues tend to be associated with lower risk.
- 3 Optimized index construction methods may allow investors to incorporate ESG into portfolios while maintaining characteristics that are otherwise similar to a parent index in key ways.

Introduction

In recent years, institutional and retail investors have shown growing interest in two distinct areas: environmental, social and governance (ESG) investing, and indexing. While the reasons for gravitating toward these areas differ, the simultaneous interest in both has led to a proliferation of ESG indices, and a movement toward adopting these ESG indices as policy benchmarks. Yet the many different investment approaches encompassed under the broad umbrella of “ESG investing” are reflected in the significant variety among such indices, each of which may have distinct ESG data, investment objectives, index construction methods and approaches to impact.

Investors exploring the use of an ESG policy benchmark must consider these differences as part of their due diligence processes. This paper aims to highlight some of the key considerations in the construction of ESG indices, using the recently launched Bloomberg SASB ESG Index family as a case study through which to illuminate these questions. We will:

- 1** Explore the rise of the separate but related phenomena of ESG and index investing
- 2** Examine challenges posed by the ESG data sources that power ESG indices
- 3** Introduce a transparent ESG scoring system developed by State Street Global Advisors that is designed to address these challenges (R-Factor™)
- 4** Highlight key considerations in the construction of an ESG benchmark, using the Bloomberg SASB ESG indices, powered by the R-Factor ESG score, as an example of these decisions in practice, and
- 5** Compare performance and characteristics of the Bloomberg SASB ESG indices to other ESG indices to illustrate the impact of these construction considerations

Growing Investor Preference for ESG and Index Investing

ESG investing — defined as the systematic consideration of ESG information in the investment process — encompasses a wide variety of objectives and approaches. Figure 1 provides an overview of the six most common types of ESG investing.

Figure 1
**Framework for
 Common Approaches
 to ESG Investing**

ESG Investing Approach	Description
Exclusionary Screening	Excludes companies, sectors or countries from the permissible investment universe if involved in certain activities based on specific criteria.
Best in Class	Explicitly aims to improve the overall ESG profile of a portfolio.
Sustainability Themed/ "Thematic" Investing	Selects companies that have the best ESG score or criteria in a particular sector or ESG topic.
ESG Integration	Systematically includes ESG factors into investment analysis and investment decisions, alongside traditional financial factors.
Asset Stewardship	Utilizes the informed exercise of voting rights, coupled with targeted and value-driven engagement, in a program that robustly considers the ESG issues material to portfolio companies.
Impact Investing	Selects assets with an explicit objective of creating impact. (Expected returns may be market or concessionary.)

We see investor interest in ESG motivated by a variety of reasons. In a survey of more than 300 global institutional investors conducted by State Street Global Advisors and published in November 2019, the most significant factors driving institutions to adopt ESG principles included their view of ESG as a fiduciary duty (46 percent of respondents), the desire to meet or get ahead of regulation (46 percent), the desire to mitigate ESG risks (44 percent) and the desire to keep up with market standard setters such as the Principles for Responsible Investment (34 percent). Other common reasons included an organizational commitment to “doing the right thing” and a desire to avoid the reputational risk associated with holding certain assets.

Collectively, the impact of these preferences is significant. The lack of a consistent industry standard on ESG terminology makes sustainable assets difficult to quantify, and so estimates of global sustainable investments vary by source. According to the biannual Global Sustainable Investment Review (2018), sustainable investing assets were \$30.7 trillion at the start of 2018, a 34 percent increase in two years.

Happening simultaneously with the move toward ESG investing is a shift from active to indexed equities. This trend is particularly pronounced in the United States, where in April 2019, assets in indexed equity funds reached parity with those invested in active equity funds for the first time (Morningstar 2019). Downward pressure on fees, coupled with a decade-plus run in which active funds have underperformed broad market benchmarks, have boosted investor interest in index investing as a way to achieve cost-effective diversification and competitive returns.

Investor interest in both ESG and indexing has led to a significant increase in the number of ESG indices and investable products available in the market. The Index Industry Association recorded a 14 percent rise in the number of ESG indices in the year to June 2019. While this represents only a small fraction of the 2.96 million total indices during the period, the number of ESG benchmarks grew quickly while traditional benchmarks contracted, declining 20 percent during the same period (IIA 2019). Assets are moving this direction as well: According to Morningstar (2020), estimated net flows into open-ended and exchange-traded sustainable funds available to US investors totaled \$20.6 billion in 2019, four times the previous annual record for net flows set in 2018.

The ESG Data Challenge

As more investors bring indexed ESG exposure into their portfolios, the ESG data powering those solutions is receiving more attention. Quality data — that which is financially material, consistently reported and comparable across firms — is critical to strong investment analysis. Yet the current landscape of ESG data presents challenges that investors should be aware of as they implement ESG in portfolios.

Unlike traditional financial information, companies are — for the most part¹ — not required to report on the risks and opportunities posed to the business by ESG issues. As a result, companies have discretion over which information on these topics they provide to investors, leading to wide discrepancies in the availability and quality of ESG data.

To address these challenges, third-party ESG data providers have proliferated in recent years, each with its own approach to gathering ESG information about a company, assessing which issues are material, and weighting or otherwise treating its data. These methodologies are a reflection of the perspectives of each data provider — but differences in what each provider believes to be most important result in a low correlation of scores among different providers. Recent research by the IMF comparing the scores of two leading ESG data providers (Sustainalytics and RobecoSAM) on the S&P 1200 Global Index underscores this lack of agreement in scoring (IMF 2019). That work supports some of the earlier findings made by Bender et al. (2019).

Without transparency into the methodologies and materiality frameworks of different ESG data providers, investors have a hard time identifying what the scores represent, or whether their views on ESG align with those of a given data provider. In addition, companies find it challenging to know which sustainability areas matter most to their business. This lack of market infrastructure — the absence of a standard, widely adopted framework for financially material ESG information — is what led State Street Global Advisors to create R-Factor.

R-Factor: A Transparent ESG Scoring System

R-Factor is an ESG scoring system that measures the performance of a company's business operations and governance as it relates to financially material ESG issues facing the company's industry. The score draws on the underlying metrics from multiple ESG data providers and leverages widely accepted, transparent materiality frameworks to generate a unique ESG score for listed companies.

The score differentiates between a broad set of ESG issues, which are industry-specific and geography-agnostic, and traditional corporate governance issues, which are geography-specific and industry-agnostic. This reflects the differing nature of these two topics. For example, the sustainability issues that matter most to the long-term financial performance of an apparel company (e.g., supply chain management, materials sourcing and efficiency) are relevant to companies regardless of where they are based but are different from the issues that matter most to a software company (e.g., data security and customer privacy). Conversely, corporate governance varies significantly across geographies: The expectations of Japanese investors regarding issues such as shareholder rights and board accountability are different from those of US investors. R-Factor takes these differences into account.²

Reflecting these nuances, the overall R-Factor score is based on two sub-models. Each sub-model leverages a transparent materiality framework and maps the underlying metrics of ESG data providers to that framework (Figure 2).

The ESG Model (90 percent of the overall R-Factor score) is based on the materiality framework developed by the Sustainability Accounting Standards Board (SASB).³ It draws on the metrics of three ESG data providers and maps these metrics to 26 "general issues" in SASB's materiality map.⁴ The use of underlying metrics, rather than data providers' aggregate ESG scores, is essential to avoid capturing data providers' individual perspectives on materiality, data treatments and industry-specific adjustments. The scoring model mapped more than 450 raw-level ESG metrics to the 26 general issues and the 200-plus specific sustainability topics within those general issues,⁵ which are outlined in the SASB materiality map. The calculation of the ESG sub-score averages all financially material metrics mapped to relevant general issues across all three data providers and weights each data provider equally. The ESG sub-scores are then normalized to standardize the data.

The CorpGov Model (10 percent of the overall R-Factor score) is based on region- or market-specific corporate governance codes. These codes are sets of principles developed by regulators or investors that describe minimum corporate governance expectations in a given region.⁶ Like the SASB materiality map, these are transparent and widely supported by the investment community. State Street Global Advisors drew upon 15 regulatory codes and two investor-developed codes.⁷ To incorporate the corporate governance codes into R-Factor, the firm mapped the material metrics from ISS Governance to the principles articulated in each of the 17 codes.⁸ This approach ensures transparency and consistency with the governance standards that are appropriate for the legal and regulatory regimes in which each company operates. The CorpGov score of a company is calculated by averaging the scores of all corporate governance metrics that are material for the specific region and for which data are available. The CorpGov scores are then normalized at the universe level.

The final R-Factor scores are based on the aggregation of the normalized scores sourced from the two sub-models. The model merges the two ratings to generate a 0–100 score for a particular company at a specific point in time, and normalizes a final time so that scores are comparable at the total universe level.

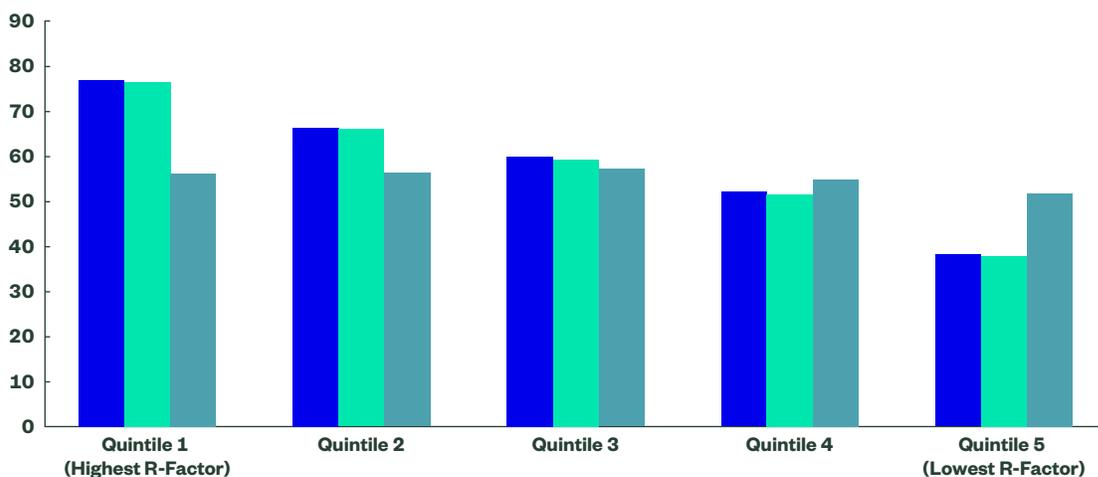
Figure 2
Overview of State Street Global Advisors’ R-Factor ESG Score

	Data Characteristics	Materiality Frameworks Leveraged	Data Sources	Weighting
ESG	Industry-specific, market-agnostic	Sustainability Accounting Standards Board (SASB)	3	90% of overall score
CorpGov	Industry-agnostic, market-specific	17 market-specific corporate governance codes, developed by regulators or investors	1	10% of overall score
R-Factor	Measures performance of a company’s business operations + governance as it relates to the financially material ESG issues facing the company’s industry	Transparent, commonly accepted materiality frameworks	4 data providers	100%

Because the scores are based primarily on the “ESG” sub-model, there is a close relationship between a company’s “ESG” score and its overall R-Factor score (Figure 3).

Figure 3
Analysis of the MSCI World Index Average R-Factor Scores by R-Factor Quintile

■ R-Factor Score
■ ESG Score
■ Corp Gov Score

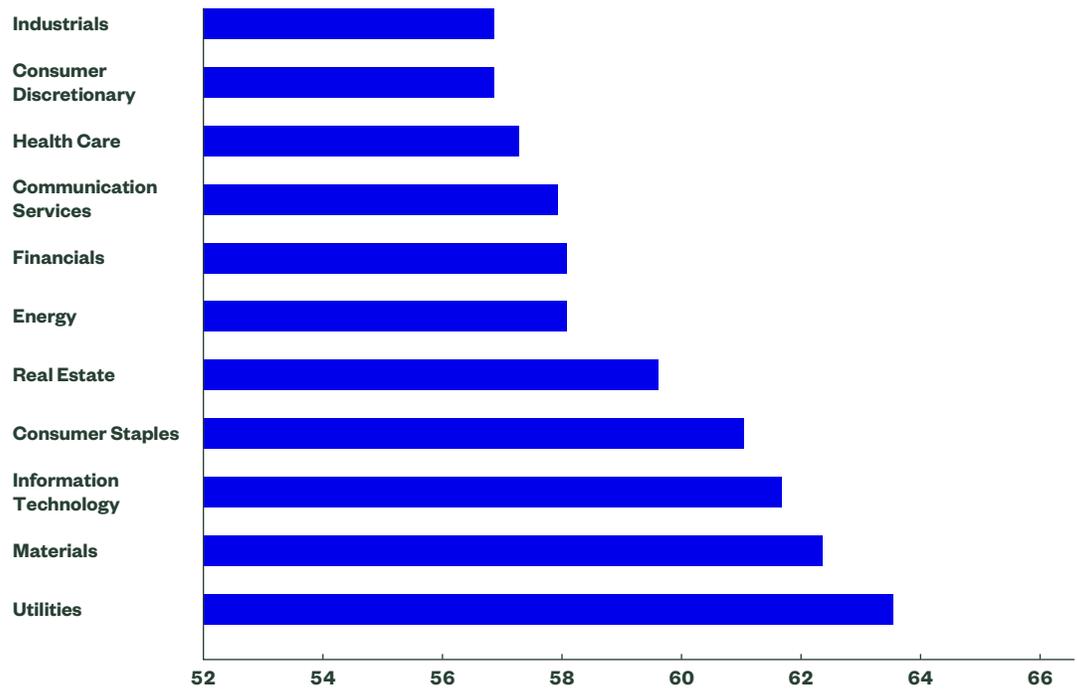


Source: As of September 30, 2019.

To illustrate characteristics of R-Factor scores which may be of interest to investors, we analyzed R-Factor scores for constituents of the MSCI World Index as of September 30, 2019. Our results offer support to some areas of emerging consensus in ESG investing — for example, that companies with larger market capitalizations tend to score better on the management of financially material ESG risks than their smaller peers, and that companies that are relatively stronger on financially material sustainability issues tend to exhibit lower risk than companies that are relatively weaker on such issues as of September 30, 2019. Below, we highlight both descriptive characteristics of R-Factor scores in the MSCI World universe, as well as relationships between R-Factor scores and key investment considerations.

Sectors did not score evenly on sustainability issues, but in general the across-sector score variation wasn't substantial — average R-Factor scores by sector tended to fluctuate around 60 (Figure 4). We observed greater divergence when viewing R-Factor scores geographically: Country averages for constituents of the MSCI World universe ranged from as low as 46 to as high as 78 (Figure 5). We also observed that when examining average scores regionally in developed markets, while there was within-region variation, companies in Europe and the Middle East had higher R-Factor scores on average. This may be a result of both differing expectations around the role of corporations in society, as well as regulatory regimes that require relatively more management and disclosure of certain ESG issues.

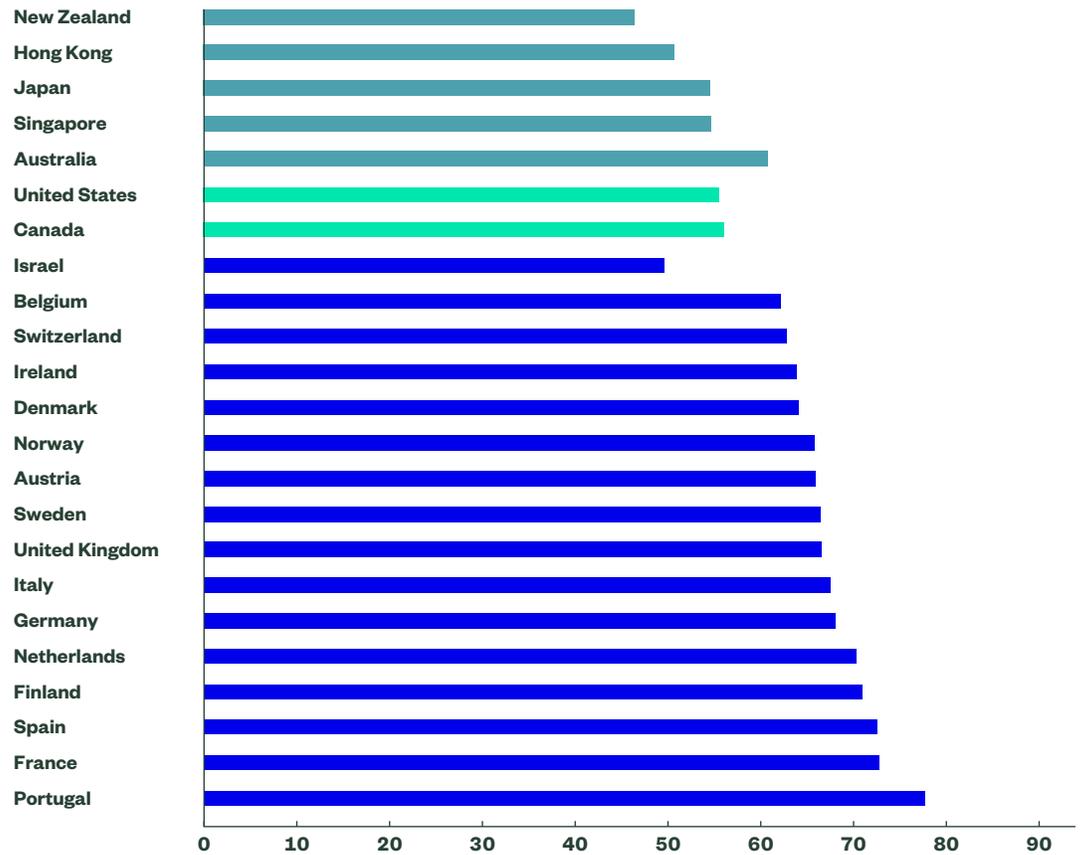
Figure 4
Analysis of the MSCI World Index
 Average R-Factor Score by Sector



Source: As of September 30, 2019.

Figure 5
Analysis of the MSCI World Index
 Average R-Factor Score by Location

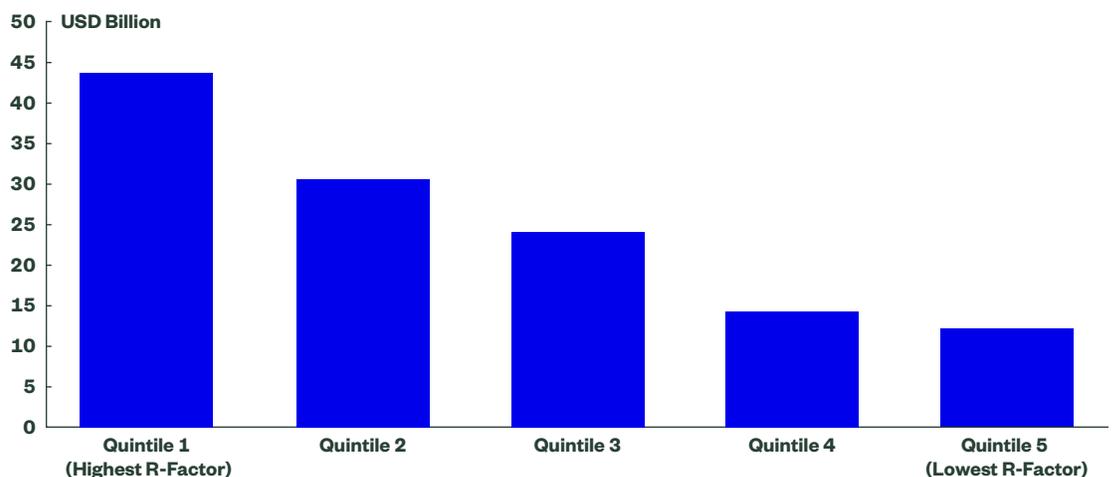
■ Europe & Middle East
 ■ Americas
 ■ Asia Pacific



Source: As of September 30, 2019.

As highlighted above, R-Factor scores supported the assertion that larger companies tend to be stronger performers on the management of financially material ESG risks and opportunities (Figure 6). We observed a monotonically decreasing average market capitalization when examining R-Factor scores in quintiles from high to low. This may be a result of stronger management of sustainability issues; it may also be partly because of the resources available to larger companies, which allow for sustainability teams that are dedicated to putting out the type of disclosures on which R-Factor scores are based.⁹

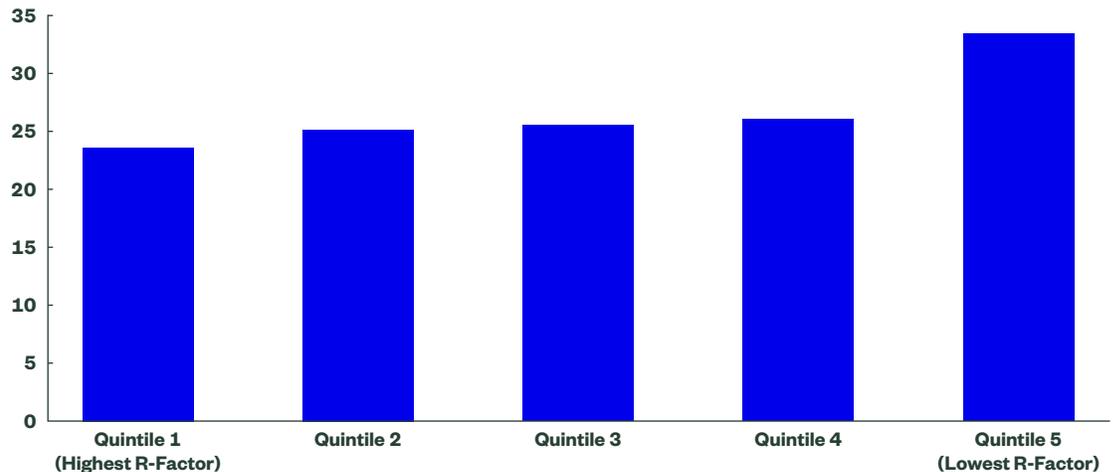
Figure 6
Analysis of the MSCI World Index
 Average Market Cap by R-Factor Quintile



Source: As of September 30, 2019.

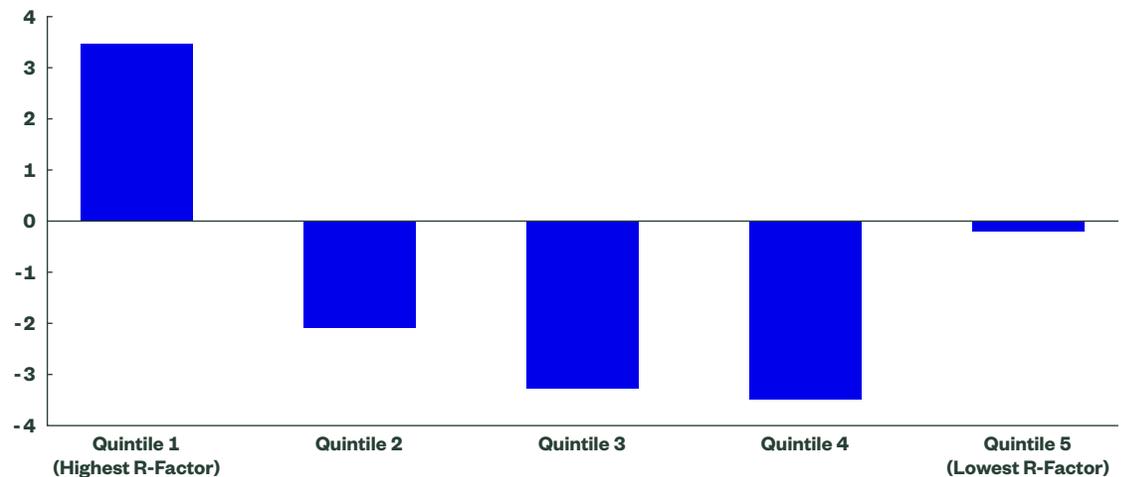
In terms of risk, we found that the firms with the lowest R-Factor scores had exhibited higher risk in recent years, though firms with the highest R-Factor scores did not necessarily experience the lowest risk (Figure 7). This finding corroborates the view of managing portfolio risk by managing ESG risks. We also found that the firms with the highest R-Factor scores — that is, those that were strongest performers on the management and disclosure of financially material ESG issues — had the highest price momentum (i.e., were rewarded by investors over the period we analyzed), though the firms with the lowest R-Factor scores were not necessarily punished by the market (Figure 8). We did not see an apparent pattern between R-Factor scores and valuation, profitability or leverage (see Appendix).

Figure 7
Analysis of the MSCI World Index
 Average Annualized Stock Volatility (%) by R-Factor Quintile



Note: As of September 30, 2019. Volatility was calculated from monthly returns in the previous 60 months.

Figure 8
Analysis of the MSCI World Index
 Average Past Stock Performance (Equity Momentum) by R-Factor Quintile



Note: As of September 30, 2019. Momentum is measured by total return in the past 11 months up to one month ago.

Our data suggest that there is value in considering a company’s performance on financially material ESG issues as part of the investment process. The Bloomberg SASB ESG Indices are an example of how investors can do so in practice.

Constructing an ESG Benchmark: The Bloomberg SASB ESG Index Family

Large-scale asset owners and asset managers investing with an ESG focus require a balanced approach in order to maintain the asset class risk-return characteristics, gain superior ESG characteristics and achieve these investment objectives without taking large unintended exposures to risk factors or sector bets. An indexed approach to ESG investing requires additional focus on diversification and liquidity for it to be used as the basis for index-linked investment vehicles, such as exchange-traded funds (ETFs) and exchange-traded notes (ETNs).

Indexed implementation of ESG investments can be achieved by reweighting a traditional benchmark in such a way that the new index has enhanced ESG characteristics compared with a market capitalization-weighted index, or a market capitalization weighted index with a style overlay. The weighting methodologies of ESG indices have evolved over time and can be grouped in two main categories:

- 1 Heuristic Weighting** Heuristics-based weighting methodologies calculate the index weights of the securities by using simple rules that are applied to all constituents in a systematic way. For example, the index can be created by tilting the market capitalization weight of the securities based on the R-Factor scores of the security.

Investors who have some flexibility with tracking error budgets and the amount of ESG enhancements can benefit from these simplistic heuristics-based weighting methodologies. The simplicity and transparency of the heuristics weighted indices make them an ideal candidate for a passive benchmark.

- 2 Optimized Indices** Optimization-based weighting methodologies are a more technologically advanced approach to deriving index constituent weights using a risk optimizer. An optimizer can produce a portfolio that satisfies the objective of increasing the ESG characteristics of an index while maintaining other desirable risk-return characteristics of the index.

Investors who are seeking multiple investment objectives together with investment constraints such as tracking-error limits, minimum security size and preset levels of ESG enhancements prefer to use the more robust approach of optimization. The ability to implement investment constraints like minimum position size and limits on sector deviations from the benchmark indices make them the preferred approach to develop indices that can be used to create exchange-traded products like ETFs and ETNs.

To understand the impact of the various approaches of weighting, we examined two different weighting methodologies using the constituents of the Bloomberg US Large Cap Index (ticker: B500) and the R-Factor score. The two weighting methodologies were:

Methodology 1 | R-Factor Tilted Index constituent weights are derived from their market capitalization weight using a tilt based on the R-Factor z-score for B500 securities.

Methodology 2 | R-Factor Optimized Index constituent weights are derived using a risk optimizer. The risk optimizer finds the most optimal allocation of assets, often involving trade-offs between multiple and sometimes conflicting goals and constrained resources.

The index characteristics were then compared to the market capitalization weighted parent index. The characteristics we examined were: 1) increase in R-Factor score, 2) ex-post tracking error to the parent index and 3) active sector bets versus the parent index.

Below we provide details about the two different weighting methodologies.

1 R-Factor Tilted Index constituent weights are derived from their market capitalization weight using a tilt based on the R-Factor z-score for B500 securities. The market capitalization weight of the security is:

- Doubled if the z-score for the R-Factor is equal to or above 1
- Halved if the z-score for the R-Factor is equal to or below -1
- Unaltered for securities with z-scores between +1 and -1

$$w_i = \begin{cases} 2 * \text{market capitalization weight}_i, & R \text{ Factor Z Score}_i \geq 1 \\ \text{market capitalization weight}_i, & -1 < R \text{ Factor Z Score}_i < 1 \\ 0.5 * \text{market capitalization weight}_i, & R \text{ Factor Z Score}_i \leq -1 \end{cases} \quad (1b)$$

$$s.t. w_i \geq 0, \sum_i w_i = 1$$

Where

w_i is weight of the security in the index, $\text{market capitalization weight}_i$ is the weight of the security in the market capitalization weighted parent index.

The ESG tilted indices are popular with asset owners who are interested in maintaining broad asset class exposures while enhancing their ESG exposures (e.g., MSCI ESG Universal Indexes).

2 R-Factor Optimized Index constituent weights are derived using a risk optimizer. The risk optimizer finds the most optimal allocation of assets, often involving trade-offs between multiple and sometimes conflicting goals and constrained resources. In our case study, our objective was to increase the index level R-Factor while maintaining the following set of constraints:

$$\max \quad \sum_i w_i * R \text{ Factor Z Score}_i \quad (2)$$

s.t.

$$\sqrt{(w-w^o)Q(w-w^o)} < 0.9\% \quad \text{active total risk less than 0.9\%}$$

$$w_i \geq 0, \sum_i w_i = 1 \quad \text{long only}$$

$$w_i \geq 0.02\% \quad \text{minimum position size}$$

$$\sum_i |w_i - w_i^o| \leq 20\% \quad \text{two-way turnover less than or equal to 20\%}$$

$$\sum_{i \in \text{Sector}} |w_i - w_i^b| \leq 1\% \quad \text{active sector dispersion less than or equal to 1\%}$$

$$|w_i - w_i^b| \leq 1\% \quad \text{active dispersion in security weight less than or equal to 1\%}$$

Summary of Analysis

The primary objective of the ESG indices is to achieve the risk-return characteristics of the market capitalization weighted index together with enhanced ESG characteristics. In this study we found that both weighting methodologies will enhance the ESG characteristics of the index; however, the maximum level enhancement to the ESG characteristics was achieved by the optimized indices.

Figure 9 presents the index level R-Factor z-scores for the indices with different weighting methodologies. To make the R-Factor scores more meaningful and comparable with other factor exposures, the R-Factor z-scores were used as the input for all of the weighting schemes, and the ESG characteristics were measured in z-scores of R-Factor. One advantage of standard or z-scores is that they can be used to compare raw scores that are applied to different indices.

The optimization approach provided a more robust increase in ESG exposures as measured through the index level z-scores, and it also maintained all of the desirable index characteristics by using the corresponding constraints in the optimization process.

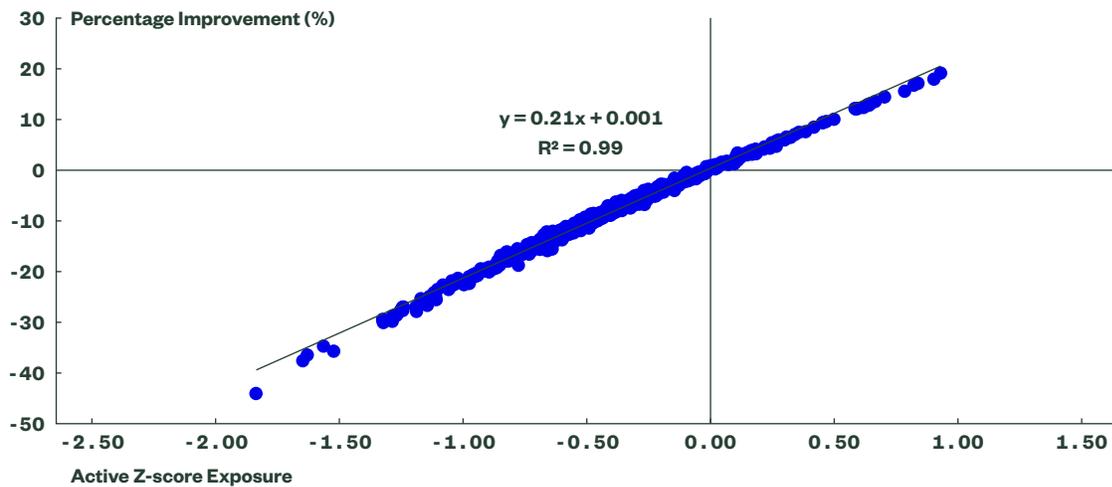
Figure 9
**Analysis of the Bloomberg
SASB ESG Index Family
R-Factor Z-Score by Index**

Index Weighting	R-Factor Z-Score
Market Cap Weighted	0.53
Methodology 1: R-Factor Tilted	0.66
Methodology 2: R-Factor Optimized	1.15

Source: As of January 28, 2020.

The R-Factor comparisons and incremental increases are presented as z-scores; however, in percentage terms, a 0.5 active z-score is equivalent to about a 10 percent increase in R-Factor score, and an active exposure of 1 is equivalent to an approximately 20 percent increase. Figure 10 shows the percentage improvement and active z-score exposures.

Figure 10
Analysis of MSCI World Universe
 Percentage Improvement in R-Factor Score vs. Z-Score Exposure



Source: As of September 30, 2019.

In ESG weighted indices, the decision to deviate from market weights is not active in the traditional sense; however, the index provider’s decision on how to select and assign weights to securities reflects a primary component of active risk. The next set of characteristics examines how these different weighting methodologies impact the risk-return characteristics of the index compared with the market capitalization weighted parent index.

Figure 11 presents the ex-ante total risk and active risk of the indices for the two different weighting schemes versus the Bloomberg US Large Cap Index, the market capitalization weighted parent index used as the starting index for the ESG weighted indices. The ex-ante risk figures were calculated using the Bloomberg Equity Risk Model and Bloomberg Portfolio Optimizer.

Figure 11
Analysis of the Bloomberg SASB ESG Index Family
 Total Ex-Ante Active Risk vs. Market Capitalization Weighted Index (B500)

Index Weighting	Total Risk	Active Risk
Market Cap Weighted	11.93	–
Methodology 1: R-Factor Tilted	13.65	4.57
Methodology 2: R-Factor Optimized	11.93	0.90

Source: As of January 28, 2020

The R-Factor optimized index closely tracked the market capitalization weighted index compared with the R-Factor tilted indices. However, as additional constraints such as turnover and position size were considered to maintain the diversification and investability of the index, the model became more complex, requiring a sophisticated process to balance the conflicting goals subject to the constraints needed to maintain the desirable index characteristics.

In addition to R-Factor, volatility is another important criterion for investors. When market volatility increases, sector-level volatility becomes an important driver of the active risk. As we consider the two different weighting methodologies, we will examine the active sector dispersions compared with the market capitalization weighted parent index. Low sector dispersion compared to the market capitalization weighed parent index is the desirable characteristic.

Figure 12 presents the sector dispersion of the two ESG weighted indices versus the market capitalization weighted parent index. The R-Factor optimized index has the advantage of calibrating the sector exposures and had the least amount of sector dispersion compared to the market capitalization weighted index.

Figure 12
Analysis of Different Weighting Methodologies
 Sector Dispersion vs. Market Capitalization Weighted Index



Sector	1. R-Factor Tilted			2. R-Factor Optimized		
	% Wgt (P)	% Wgt (B)	% Wgt (D)	% Wgt (P)	% Wgt (B)	% Wgt (D)
Communications	21.32	11.63	9.69	10.33	11.63	-1.30
Consumer Discretionary	21.60	8.86	12.74	8.81	8.86	-0.05
Consumer Staples	4.33	7.64	-3.31	7.69	7.64	0.05
Energy	0.97	3.87	-2.90	3.29	3.87	-0.58
Financials	5.00	11.68	-6.68	11.06	11.68	-0.62
Health Care	9.94	14.09	-4.16	13.99	14.09	-0.10
Industrials	5.39	8.59	-3.20	8.44	8.59	-0.14
Materials	1.16	1.89	-0.72	2.27	1.89	0.39
Real Estate	1.62	3.08	-1.46	4.08	3.08	1.00
Technology	27.23	25.16	2.08	26.45	25.16	1.29
Utilities	1.44	3.52	-2.08	3.58	3.52	0.06

Source: As of January 28, 2020.

For investors seeking to achieve higher ESG characteristics while maintaining low active risk and sector dispersion compared to the market capitalization weighted parent index, the R-Factor optimized index has advantages over the R-Factor tilted indices, as investors can control the different sector and factor bets using the optimizer.

Performance Characteristics of the ESG Indices

Although interest in ESG investing continues to grow, the fear of missing out on returns remains a concern for many investors. Figure 13 is a comparison of the Bloomberg SASB US Large Cap ESG Ex-Controversies Select Total Return Index (BESGOXT), an ESG optimized index derived from the Bloomberg Large Cap Index (B500), to the MSCI KLD 400 Social Index (KLD400 Index), a market capitalization weighted index derived from the MSCI USA Investable Market Index.

Figure 13
Analysis of Bloomberg SASB US Large Cap ESG Ex-Controversies Select Total Return Index and MSCI KLD 400 Social Index vs. Their Parent Indices
 Annualized Performance of Comparable ESG Indices

	Annual Returns (%)	Annual Volatility (%)	Annual Tracking Error (%)
BESGOXT Index	12.80	11.37	1.12
B500T Index	12.21	11.40	–
KLD400 Index	11.92	11.60	1.62
MXUSIM Index	11.71	11.70	–

Source: March 2014–December 2019.

While these ESG indices have similar risk/return characteristics, tracking error to the parent index is also an important consideration for investors. Both the Bloomberg SASB US Large Cap ESG Ex-Controversies Select Total Return Index and MSCI KLD 400 Social Index maintain a tight tracking error with their parent indices, Bloomberg US Large Cap Index (B500T) and MSCI US IM Index respectively.

Another common concern with ESG indices is the existence of factor biases. Fama-French-based models are often used in ESG literature to detect biases with ESG strategies and indices. We can define a bias as a difference in characteristic between the investment universe and the index. For example, if an index has a small-cap bias, it means that the companies in the index are smaller in relation to its investment universe. A bias is measured by factor beta. The three factor betas (market, size and value) are analogous to the classical beta but not equal to it, as the relationship is now better explained by using the two additional factors.

Figure 14

Analysis of Bloomberg SASB US Large Cap ESG Ex-Controversies Select Total Return Index and MSCI KLD 400 Social Index:

Intercepts and Coefficients from the Fama-French Three-Factor Model

	Intercept	Mkt-RF	SMB	HML	R Square
BESGOXT Index	0.08	0.97	-0.11	-0.01	0.99
KLD400 Index	0.00	0.98	-0.08	-0.04	0.98

Source: March 2014–December 2019.

As shown in Figure 14, analysis of these two ESG indices did not indicate any substantial style biases. As concluded by other studies (Schröder 2004), the ESG indices are not at any disadvantage concerning their performance compared with a similar broad asset class index.

Conclusion

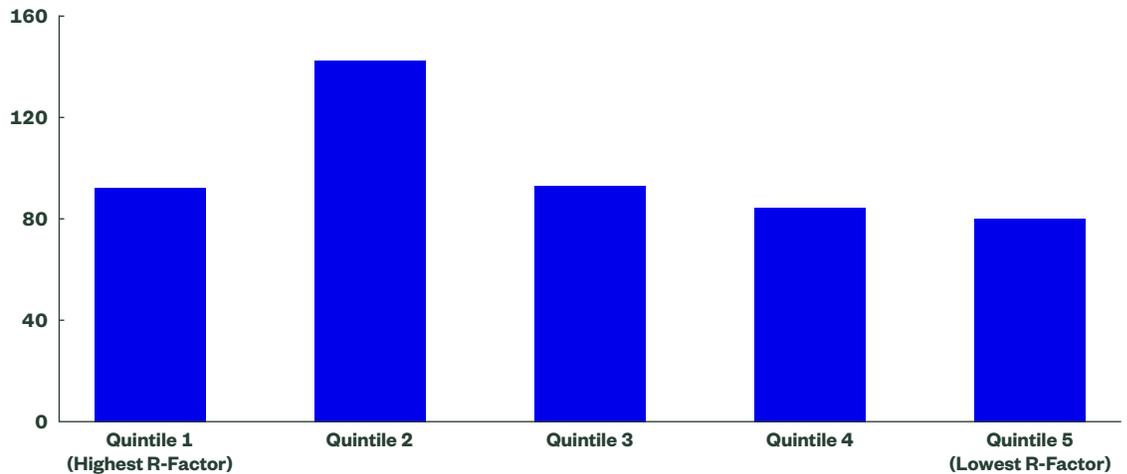
ESG investing is a quickly evolving space, and one that is expected to garner more interest from investors over time. For index investors, our work suggests that both the ESG data powering investment solutions, as well as the index construction methodology, can have an impact on the performance and characteristics of ESG indices.

The lack of market infrastructure — the absence of a standard, widely adopted framework for financially material ESG information and thus different methodologies adopted by various ESG data providers — presents challenges for ESG investors. This paper showed how a transparent ESG scoring system that draws on data across multiple ESG data providers and leverages widely accepted, transparent materiality frameworks can help to address these challenges.

When it comes to constructing ESG indices, there can be numerous approaches. This paper compared one optimized approach with a stylized heuristic weighting scheme, and showed that an optimized index, when constructed appropriately, can better trade off the ESG exposure improvement vs. the active risk stemming from deviating from the cap-weighted benchmark, whether at an aggregated portfolio level, or from certain segments of the market.

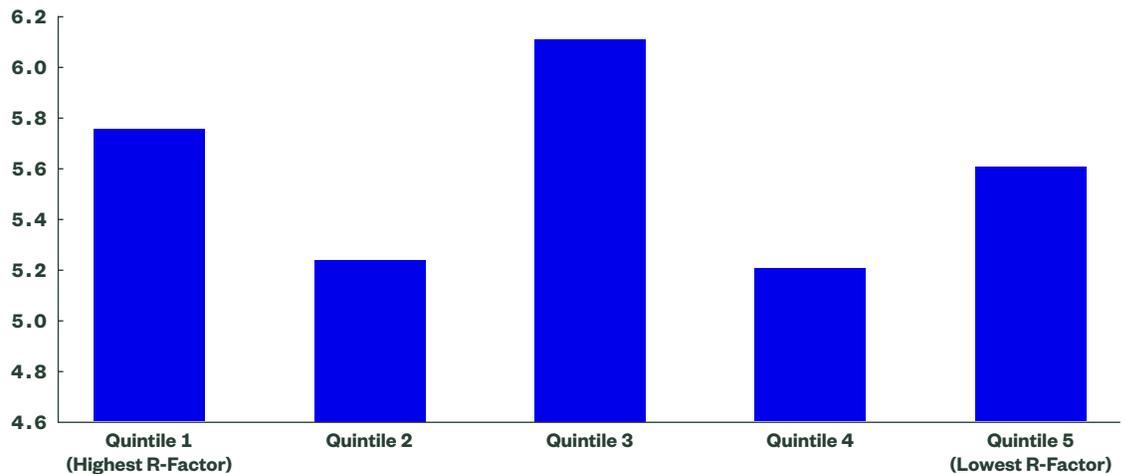
Appendix

Figure 15
Analysis of the MSCI World Index
Leverage by R-Factor Quintile



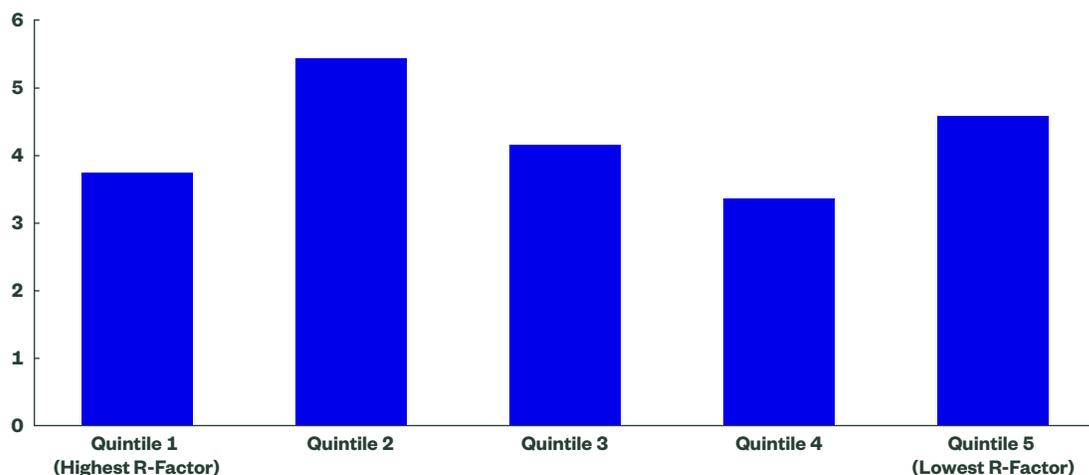
Source: As of September 30, 2019.

Figure 16
Analysis of the MSCI World Index
Average Profitability by R-Factor Quintile



Source: As of September 30, 2019.

Figure 17
**Analysis of the
 MSCI World Index**
 Average Price-to-Book
 Ratio by R-Factor
 Quintile



Source: As of September 30, 2019.

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Endnotes

- 1 This is changing, particularly in Europe and the United Kingdom. For example, the EU Non-Financial Reporting Directive requires publicly listed companies with more than 500 employees to disclose information about how they operate and manage social and environmental information. However, the directive offers companies discretion in which frameworks they use to comply with the regulation.
- 2 The “G” in ESG does stand for governance, but is a different dimension of governance than traditional corporate governance. In the context of ESG, governance refers to management of issues in a business that have the potential to conflict with interests of broader stakeholder groups from an environmental and social perspective, such as regulatory compliance, risk management and anticompetitive behavior. Corporate governance, in the traditional sense, refers to issues dealt with more formally at the board level, such as board accountability, shareholder rights and engagement, and executive compensation. The State Street Global Advisors methodology reflects this distinction using SASB’s materiality map to address ESG-related governance and market-specific codes to address corporate governance.
- 3 SASB is a nonprofit organization whose mission is to help businesses around the world identify, manage and report on the sustainability topics that matter most to investors. Established in 2011, SASB has developed two key pieces of market infrastructure: a commonly accepted materiality map identifying financially material ESG issues for 11 sectors and 77 industries, as well as a set of sustainability accounting standards that companies can use as a guide to report on material topics and related metrics. SASB standards were developed over six years, with consultation and public comment from investors, companies and other stakeholders.
- 4 SASB’s general issues are 26 sustainability-related business issues, which encompass a range of disclosure topics and their associated sustainability accounting metrics. Examples of general issues include “diversity, inclusion and employee engagement” and “selling practices and product labelling.”
- 5 Data as of May 2019. Numbers may change slightly as data providers change the number of metrics available in the data sets that power R-Factor.
- 6 Further details about R-Factor’s scoring model, including data treatment, can be found in “R-Factor™ Scoring Model: Bringing Transparency to ESG Investing.”
- 7 The codes cover the following locations: Australia, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States. All other locations are covered by the code developed by the International Corporate Governance Network (ICGN).
- 8 We employ only the corporate governance metrics that are material to a given code. A metric is determined to be material if (a) it is referenced in the code and (b) the code establishes quality or minimum expectations needed for compliance.
- 9 The R-Factor methodology is designed to respond to this potential resource bias over time by basing the scores primarily on SASB’s materiality map, a relatively simple and user-friendly disclosure framework. This should make it easier for companies with less robust sustainability disclosure (in general, small- and mid-cap companies, as well as those in emerging markets) to enhance disclosure over time.

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Glossary

JEL Codes

- G10: General (Asset Markets & Pricing)
- G11: Portfolio choice; investment decisions (Asset Markets & Pricing)

Keywords Investment Decisions, Portfolio Choice, ESG, Stock Market Data, Equities, ESG, Indexing.

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