SUSTAINALYTICS

THE ESG RISK RATINGS

POTENTIAL APPLICATIONS FOR INVESTORS

WHITE PAPER — VOLUME 3 June 2019

Doug Morrow, MBA
Director,
Thematic Research

Sophia Burress, CFA
Manager,
ESG Rating Products

About Sustainalytics

Sustainalytics is a leading independent ESG and corporate governance research, ratings and analytics firm that supports investors around the world with the development and implementation of responsible investment strategies. For over 25 years, the firm has been at the forefront of developing high-quality, innovative solutions to meet the evolving needs of global investors. Today, Sustainalytics works with hundreds of the world's leading asset managers and pension funds that incorporate ESG and corporate governance information and assessments into their investment processes. With 17 offices globally, Sustainalytics has more than 500 staff members, including over 200 analysts with varied multidisciplinary expertise across more than 40 industry groups. Over the last three consecutive years, investors named Sustainalytics among the top three firms for both ESG and corporate governance research in the Independent Research in Responsible Investment Survey. For more information, visit www.sustainalytics.com

Sustainalytics
contact@sustainalytics.com

Table of Contents

Foreword

Completing the white paper series

Dr. Hendrik Garz
Executive Director, ESG Rating Products & Thematic Research
hendrik.garz@sustainalytics.com

With the release of Sustainalytics' ESG Risk Ratings, we have moved into a new phase in the evolution of corporate ESG ratings. The rating is built on key features including financial materiality, granularity and comparability, and we foresee numerous applications for our clients in the context of investment decision-making. Through the publication of our three-part series of reports on Sustainalytics' ESG Risk Ratings, we deliver on our promise to provide as much transparency as possible for our clients and other stakeholders.

This study completes the three-volume ESG Risk Ratings white paper series. The series began in October 2018 with the publication of *Moving up the Innovation Curve: White Paper – Volume 1*. The report offered a detailed description of the methodology behind the ESG Risk Ratings, analysis of rating outcomes, and introduced the results of our empirical testing. The second volume, entitled *Exploring the Internet Software and Services Subindustry, White Paper – Volume 2,* was published in November 2018. The second volume moved the reader step by step through a complete subindustry-specific discussion of the rating and concluded with a case study of Facebook.

Shifting gears to application

In this study, we shifted the discussion from a description of the ESG Risk Ratings to one focused on application, with a view to demonstrating how investors might be able to make use of Sustainalytics' new flagship ratings product across seven use cases: industry tilts, WACC adjustments, smart beta ESG, best-in-class strategies, screening techniques, thematic investing and engagement.

Creating value for our clients

We hope the examples and analysis introduced throughout this report create value for our clients by generating ideas for potential applications of the ESG Risk Ratings. We also trust that they are a valuable contribution to the ongoing industry discussion about ESG integration. The empirical tests we report on in this study support the idea that ESG factors can add value in investment decision-making by increasing equity portfolio returns and/or reducing risk. However, the evidence we have provided so far can only be the starting point. Much more needs to be done to explore the financial value of ESG integration and we look forward to contributing to the ongoing debate by providing additional and broader empirical tests of Sustainalytics' flagship ratings product in future publications. I hope you will enjoy reading this report.

Sincerely,

Authors:[1]

Doug Morrow, MBA
Director, Thematic Research
doug.morrow@sustainalytics.com

Sophia Burress, CFA
Manager, ESG Rating Products
sophia.burress@sustainalytics.com

Executive summary

Applying the ESG Risk Ratings

In this report, the third and final installment in Sustainalytics' ESG Risk Ratings white paper series, we discuss how investors could potentially apply the ESG Risk Ratings to their investment process. We focus on seven specific use cases: industry tilts, weighted average cost of capital (WACC) adjustments, smart beta ESG, best-in-class (BIC) strategies, screening techniques, thematic investing and corporate engagement.

Our objective is to aid Sustainalytics' clients in generating ideas about how the ESG Risk Ratings could be operationalized across a range of investment processes. More broadly, we seek to contribute to ongoing industry dialogue about how ESG information can be integrated into investment decision-making.

Key takeaways

Industry tilts
- The ESG Risk Ratings proved useful in creating industry tilts that investors could potentially use to address the differences in industry-level ESG risk.
- Sample portfolios built to reflect three tilt scenarios (conservative, moderate and aggressive) led to reductions in ESG risk up to 3.6% compared to the FTSE All-World index.
- The sample portfolios outperformed the FTSE All-World index during a 2014-2018 holding period from a total return and risk-adjusted perspective, with Sharpe ratios up to 0.50 compared to 0.45 for the benchmark.

WACC adjustments
- We investigate the relationship between estimated WACC values and ESG Risk Rating scores for 3,542 companies.
- We find a positive, albeit weak, relationship (correlation coefficient of 0.03) between these variables, which could suggest that the market has yet to learn how to price material ESG risk into the cost of capital.
- Using a simplified discounted cash flow (DCF) model, we examine the effects of using an ESG risk-adjusted WACC on the net present value (NPV) of an estimated constant 2020 free cash flow (FCF). The effects for a selection of FTSE All-World constituents range from +0.5% to -0.4%.

Smart beta ESG
- We construct a parsimonious smart beta ESG strategy using dividend yield, return on assets and ESG Risk Rating scores.
- Sustainalytics' Smart Beta ESG FTSE 100 Sample Portfolio achieved a positive active return (3.4%) and an improved Sharpe ratio (0.36 vs 0.32) compared to the FTSE 100 index during a 2014-2018 holding period.
- The results of our analysis showcase the potential of combining the ESG Risk Ratings with fundamental inputs and factor strategies in a rules-based portfolio construction process.

Best-in-class (BIC) strategies
- We introduce a basic, three-tiered framework for thinking about the ESG Risk Ratings in the context of BIC strategy development.
- Nearly half (44%) of the 48 BIC sample portfolios analyzed as part of our research deliver statistically significant alpha, with annualized values ranging from 11.8 to 2.3.
- Our analysis indicates that momentum-based BIC strategies, which select companies based on their year-over-year improvement in unmanaged ESG risk, may be more likely to deliver risk-adjusted abnormal returns than BIC strategies based on spot ESG performance.

Screening techniques
- We develop a novel screening strategy using unmanageable risk that eliminates companies in 18 high-risk subindustries, including oil & gas and precious metals mining.
- Sustainalytics' Unmanageable Risk Screened Sample Portfolio achieved a 3.1% reduction in ESG risk compared to the FTSE All-World index.
- The sample portfolio outperformed the benchmark during a 2014-2018 holding period from both a total return and risk-adjusted perspective, with a Sharpe ratio of 0.54 compared to 0.45 for the FTSE All-World index.

Thematic investing
- We create an innovative thematic investing strategy that blends the ESG Risk Ratings with Sustainalytics' Sustainable Products Research.
- The approach demonstrates how investors could potentially gain upside exposure to positive impact themes, such as energy efficiency, green buildings and renewable energy, while minimizing ESG risk.
- The Sustainable Products Low ESG Risk Sample Portfolio, a concentrated portfolio of only 27 names, posted a Sharpe ratio of 0.71 and achieved an active return of 26.6% against the FTSE All-World index during a 2014-2018 holding period.

Corporate engagement
- We illustrate how the ESG Risk Ratings could potentially be used by investors to enhance their engagement processes.
- We map MEIs in the ESG Risk Ratings framework to four common engagement themes, including risk management, climate change and human rights.
- Using the Carbon – Own Operations MEI as a case study, we demonstrate how the ratings could potentially help investors identify specific industries and companies to engage.

Introduction

Exploring possible use cases

The first two white papers focused on the rating's methodology

Moving up the Innovation Curve: White Paper - Volume 1, published in October 2018, introduced the methodology behind the ESG Risk Ratings and summarized the results of our empirical testing.[2] *Exploring the Internet Software and Services Subindustry, White Paper - Volume 2*, released in November 2018, analyzed subindustry-specific rating outcomes, supported by a case study of Facebook.[3]

This study considers potential applications of the ESG Risk Ratings

In this report, the third and final installment in our white paper series, we move the conversation from a description of the ratings to one focused on potential applications. As shown in Figure 1, we concentrate on seven possible use cases: industry tilts, WACC adjustments, smart beta ESG, BIC strategies, screening techniques, thematic investing and corporate engagement. Our objective with this report is idea generation: we seek to assist Sustainalytics' clients by reviewing how the ESG Risk Ratings could potentially be applied across a range of investment processes.

Figure 1: Possible use cases of the ESG Risk Ratings

Source: Sustainalytics

The ESG Risk Ratings: a refresher

As the ESG Risk Ratings underpin the bulk of the analysis contained in this report, it is worth revisiting the basic methodology of the ratings and what they seek to measure. The ESG Risk Ratings measure the unmanaged risk of a company vis-à-vis a set of ESG issues that are considered financially material for that company, or what we refer to as material ESG issues (MEIs).[4] A company's overall ESG Risk Rating score is the sum total of its unmanaged risk on all applicable MEIs.

As shown in Figure 2, a multistep process is required to calculate a company's unmanaged risk. It begins with exposure, which reflects the extent to which the company is exposed to the MEI in question. Next, we consider how much of the exposure is unmanageable.[5] We then assess the extent to which the company is addressing that portion of its exposure that is manageable (i.e. manageable risk) through relevant policies, programmes or other initiatives. The end result is unmanaged risk: that portion of a company's exposure to an MEI that can be managed but, for whatever reason, is not (currently) being managed.[6]

Figure 2: Unmanaged risk – the final output of the ESG Risk Ratings
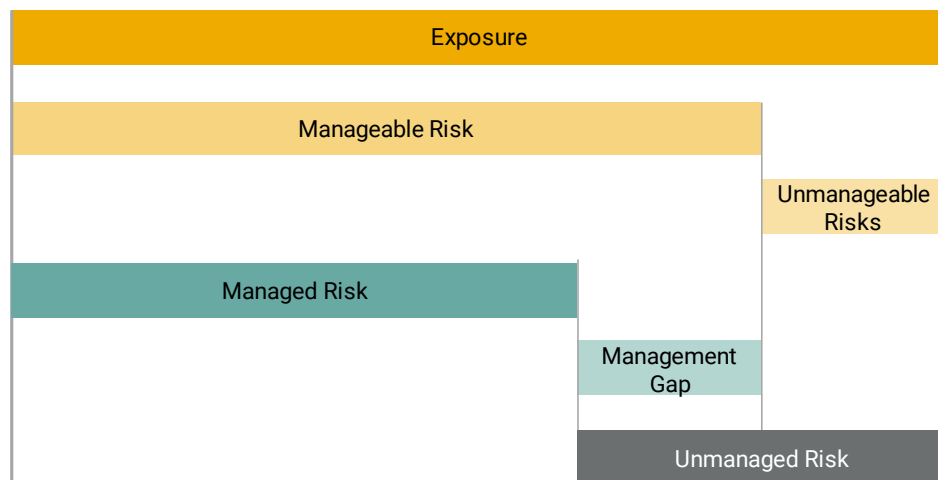
Source: Sustainalytics

Financial analysis

In several of the upcoming chapters, Sustainalytics presents the results of portfolio analyses that investigate the risk/return effects of using the ESG Risk Ratings in investment decision-making. While the results are encouraging and point to the potential of the ESG Risk Ratings to add investment value, the results of any financial backtest are subject to inherent limitations. While Sustainalytics has transparently described the portfolio analysis conducted in this report, we stress that the results require careful interpretation. With that caveat in mind, Sustainalytics believes the findings from this report demonstrate that the ESG Risk Ratings are worthy of further exploration by investors, and we look forward to testing ever-new applications of the ratings in future publications.

Industry tilts

Capturing ESG risk differentials

Industry tilts address differences in industry-level ESG risk

The first case study that we discuss is industry tilts. We define industry tilts as changes to the active weights of industries based on their ESG risk profile. Industry tilts are one of several tools that investors can potentially use in their investment process to address differences in industry-level ESG risk. These differences are significant: average ESG Risk Rating scores by subindustry range by over 40 points, from 52.7 (Oil & Gas Exploration and Production) to 11.3 (Technology Distribution).[7] Overweighting low ESG risk industries and underweighting high-risk ones can help investors reduce portfolio-level ESG risk and, given the growing financial materiality of ESG factors, potentially improve portfolio returns as well.[8]

Scenario analysis

We create three tilt scenarios: conservative, moderate and aggressive

In the example below we show, for illustrative purposes, how such a tilting strategy could be implemented in practice. We use the FTSE All-World index as the benchmark for this exercise.[9] With this benchmark in hand, we create three tilting scenarios: conservative, moderate and aggressive. The industry weights in the benchmark and three tilt scenarios are shown in Figure 3.[10]

Figure 3: Industry weights across tilt scenarios, 2018

ICB Industry	ESG Risk Rating Score	Benchmark weight	Tilt Scenario		
			Conservative	Moderate	Aggressive
Financials	26.5	21.2%	21.7%	21.9%	22.4%
Technology	22.6	19.7%	21.0%	21.6%	22.8%
Consumer Goods	24.1	14.0%	14.7%	15.0%	15.7%
Industrials	28.1	10.4%	10.5%	10.5%	10.6%
Health Care	27.7	9.0%	9.1%	9.2%	9.3%
Consumer Services	19.6	8.0%	8.7%	9.1%	9.8%
Oil & Gas	40.1	6.5%	5.2%	4.7%	3.7%
Basic Materials	39.0	5.1%	3.9%	3.3%	2.1%
Telecommunications	21.5	3.1%	3.4%	3.5%	3.7%
Utilities	37.8	2.8%	1.9%	1.2%	0.0%

Source: Sustainalytics, Bloomberg Financial, L.P., Vanguard

Determining industry tilts

Some industries are fundamentally riskier than others from an ESG point of view

Industry weights are determined through a five-step process. First, an ESG score is assigned to each ICB industry represented in the FTSE All-World index based on the average score of companies in the industry.[11] As shown in Figure 3, industries' ESG Risk Rating scores range from a low of 19.6 (Consumer Services) to a high of 40.1 (Oil & Gas). As mentioned earlier, these scores reflect fundamental differences in the ESG risk profile of these industries. Companies in some industries, such as Oil & Gas, display, on average, much higher levels of unmanaged risk than those operating in other industries.

Active ESG risk captures the dispersion in industry-level ESG scores

Second, we compute each industry's active ESG risk by calculating the distance between the average ESG Risk Rating score and each industry's ESG score and dividing by 100. For instance, the average of all subindustry ESG scores displayed in Figure 3 is 28.7 and the Financials industry's score is 26.5. The Financials industry's active ESG risk is therefore 0.02 (28.7 − 26.5 = 2.2/100 = 0.02). The Financials industry's active ESG risk is positive because it has a below average ESG score (in the ESG Risk Ratings model, the lower a company's score, the lower the level of unmanaged risk).

Tilts are determined by multiplying active ESG risk by the benchmark weight

Third, we calculate the actual tilts by multiplying each industry's active ESG risk by its benchmark weight. Carrying on with the Financials industry as an example, the industry's active ESG risk is 0.02 and it constitutes approximately 21.2% of the FTSE All-World index.[12] Thus its tilt is 0.02 x 21.2% = 0.5%.[13]

Fourth, we create each industry's revised weight by adding the tilt to each industry's benchmark weight. This step is the final calculation for the conservative scenario and the penultimate calculation for the moderate and aggressive scenarios. To illustrate, as the Financial industry has an approximate benchmark weight of 21.2%[14] and a (positive) tilt of 0.5%, its weight in the conservative scenario becomes 21.7% (21.2% + 0.5% = 21.7%).[15]

Amplifying the signal

The moderate and aggressive scenarios use an amplifier

The fifth step is a modification that applies to the moderate and aggressive tilt scenarios. These scenarios follow the same process outlined above except that the tilts are amplified by 50% in the moderate scenario and 150% in the aggressive scenario.[16] For example, in the aggressive scenario, the tilt for the Financials industry, 0.5%, is multiplied by 1 + 150%. The tilt thus becomes 1.2% and the final industry weight 22.4% (21.2% + 1.2% = 22.4%) instead of 21.7% as in the conservative scenario.

Can industry tilts add portfolio value?

Constituents were taken from the benchmark on December 31st of each year

To test the effects that industry tilts could potentially have on both portfolio ESG risk and portfolio returns, Sustainalytics created three sample portfolios based on the conservative, moderate and aggressive tilt scenarios described above. We ran the sample portfolios from 1 January 2014 to 31 December 2018 for a total of five years or 60 months. The basic process was that constituents were taken from the FTSE All-World index on 31 December of each year, subjected to the revised industry weights shown in Figure 3 and reweighted within each industry on a market cap basis.[17]

Weights were increased/decreased on a market cap-weighted basis

To illustrate, the Oil & Gas industry constituted approximately 6.5% of the benchmark based on closing prices on 31 December 2017, the final rebalancing date of the sample portfolios. The desired weight of the Oil & Gas industry in our 2018 conservative scenario is 5.2%. We thus decreased the weight of the 164 Oil & Gas constituents from the benchmark on a market cap-weighted basis such that their total weight summed to 5.2%. We repeated this process for all 10 ICB industries and for all three scenarios, ensuring that the industry weights summed to 100% in each case.

Results

ESG risk reduction

The benchmark has an ESG Risk Rating score of 23.6

The results of our analysis are shown in Figure 4. First, we consider the ESG risk reduction effects of each scenario compared to the benchmark. As of 31 December 2017, we calculate the ESG Risk Rating score of the FTSE All-World index to be 23.6.[18] This value represents the sum of the weighted ESG Risk Rating scores for all companies in the benchmark on the final rebalancing date.[19]

All of the sample portfolios have a lower ESG Risk Rating score than the benchmark

As they were purposely designed to overweight low ESG risk industries and underweight high-risk ones, the sample portfolios all achieve a lower ESG Risk Rating score than the benchmark. The sample conservative portfolio has a score of 23.3, a 1.5% reduction from the benchmark. The sample moderate portfolio has a score of 23.1 (a 2.2% reduction) and the sample aggressive portfolio has a score of 22.8 (a 3.6% reduction).[20]

The ESG risk reductions, while significant, are not particularly dramatic

While significant, these reductions are not particularly dramatic. The clustering of ESG Risk Rating scores is largely a result of the tilting strategy itself, in the sense that a) all industries represented in the starting index remain in the sample portfolios, and b) the tilts must sum to zero. Increasing the amplifier used in the moderate and aggressive scenarios would boost the ESG risk reduction, but ultimately this approach leads to a situation where some industries are weighted to zero, which we consider to be a screening strategy.

Figure 4: Comparing ESG scores and financial returns across tilt scenarios

Measure	FTSE All-World index	Tilt Scenario		
		Conservative	Moderate	Aggressive
ESG Risk Rating Score	23.6	23.3	23.1	22.8
ESG risk reduction	-	-1.5%	-2.2%	-3.6%
Total return	27.2%	29.2%	29.5%	30.4%
Active return	-	2.0%	2.3%	3.2%
Standard deviation	15.4	15.9	16.1	16.3
Sharpe ratio	0.45	0.48	0.49	0.50

Source: Sustainalytics, Bloomberg Financial, L.P., Vanguard[21]

Financial returns

All of the sample portfolios outperformed the benchmark on a total return basis

The sample conservative portfolio had an active return of 2.0% during the investment period, based on a total return of 29.2% compared to 27.2% for the benchmark. The sample portfolios built with the amplifier had higher active returns, with 2.3% under the moderate scenario and 3.2% under the aggressive scenario.

Increased volatility

However, the positive active returns of the sample portfolios came with an increase in volatility. The sample baseline portfolio had a standard deviation of return of 15.9, while the values for the amplified tilt portfolios were higher still (16.1 for the sample moderate portfolio and 16.3 for the sample aggressive portfolio). Compared to a standard variation of 15.4 for the FTSE All-World index, all three tilting scenarios produced a more volatile returns stream.

The sample portfolios had a slightly higher Sharpe ratio

The Sharpe ratio of all three sample portfolios was higher than that of the benchmark, indicating an improvement in risk-adjusted returns.[22] Over the full holding period the Sharpe ratio of the sample conservative portfolio (0.48), sample moderate portfolio (0.49), and sample aggressive portfolio (0.50) were all above that of the benchmark (0.45).

Variations

Building upon the case study

The tilting strategy described above is one of several ways that industry tilts could be implemented. For instance, investors could calculate active ESG risk using a more granular industry classification. Investors could also explore the effects of using unmanaged risk scores for particular MEIs instead of overall unmanaged risk scores. Another option could be to combine a tactical tilting strategy with a sector rotation strategy, whereby industry tilts adjust in response to shifts in the business cycle.

Investors might also consider an alternative approach that applies rules within subindustries to actively remove constituents with ESG Risk Rating scores above a certain threshold. The approach that we presented above was passive, in the sense that all benchmark constituents were included in the sample portfolios but were simply reweighted according to the aggregate ESG performance of their respective industry.

Conclusion – tilting industry weights based on ESG

Industry tilts seek to capture differences in industries' unmanaged ESG risk

Industry tilts are one of several approaches that investors could potentially take to integrate the ESG Risk Ratings into their investment process. Industry tilts seek to capture the vast differences that exist in the ESG risk profile of different industries. The three sample portfolios that Sustainalytics built using the conservative, moderate and aggressive tilt scenarios all achieved a reduction in portfolio-level ESG risk compared to the benchmark. They also outperformed the benchmark from 2014 – 2018 from a total return and Sharpe ratio perspective, albeit with increased portfolio volatility. While these findings are not conclusive, they provide preliminary evidence that industry tilts can not only reduce portfolio-level ESG risk but potentially contribute to outperformance against market cap-weighted benchmarks.

WACC adjustments

Creating an ESG risk-adjusted WACC

WACC can be thought of as the opportunity cost of investing in a firm

A second example of how investors could integrate the ESG Risk Ratings into their investment process is through the weighted average cost of capital (WACC), which usually serves as the discount rate in discounted cash flow (DCF) models. Simply put, WACC can be defined as an all-in measure of a firm's average financing costs.[23]

ESG factors can be captured in a DCF model in two main ways

As shown in Figure 5, ESG factors can be captured in DCF models in two main ways. The first is through future FCF estimates. This idea involves making assumptions about how a company's ESG risk profile could contribute, either positively or negatively, to the company's ability to generate FCF. For instance, a low ESG risk firm might reasonably be expected to face fewer regulatory penalties, which would push up FCF and ultimately increase the NPV of the firm.

The second way is by integrating ESG factors into WACC values, which is the option we expand upon in the discussion below.

Figure 5: Capturing ESG factors in a DCF model
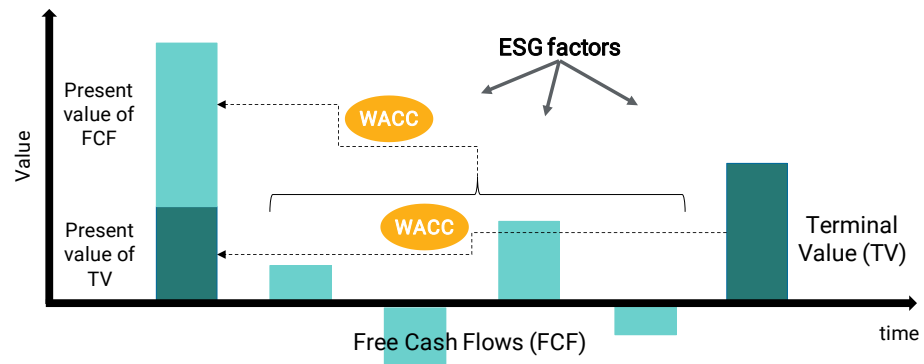
Source: Sustainalytics

Rationale for adjusting WACC

Adjusting a company's WACC may provide a more complete picture

Our intellectual starting point in this exercise is that adjusting a company's WACC to reflect unmanaged ESG risk might provide investors with a more complete picture of the company's ability to generate the FCFs that the market is forecasting. From Sustainalytics' perspective, this is not an altogether unreasonable assumption – while markets are efficient, there is good reason to believe that financially material ESG factors remain mispriced.[24]

Relationship between ESG risk and WACC

Analysis based on estimated WACC values for 3,542 companies

Before moving to the mechanics of how WACC values could potentially be adjusted, it is worth reflecting on the general relationship between ESG Risk Rating scores and WACC values. Our analysis is based on estimated WACC values collected for 3,542 companies.[25]

Correlation coefficient of 0.03

The main takeaway from our analysis is that we find no significant relationship between ESG risk and WACC values. The datasets have a positive correlation but it is extremely weak (correlation coefficient of 0.03). The lack of a strong positive or negative correlation can be seen in the scatterplot in Figure 6.

Figure 6: Scatterplot of ESG Risk Rating scores and WACC values
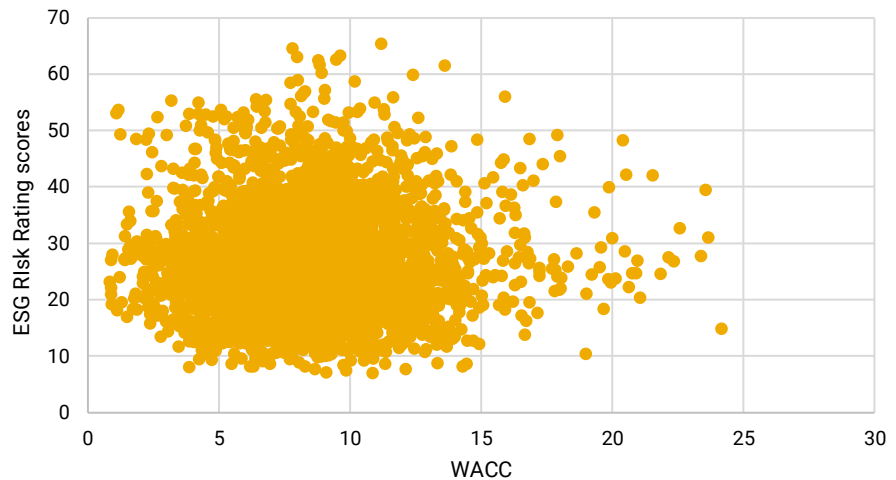
Source: Sustainalytics, Bloomberg Financial, L.P.[26]

One interpretation is that the market has yet to learn how to price ESG risk

This relationship (or lack of a relationship) can be interpreted in several ways, but in Sustainalytics' view the data may indicate that the market has yet to learn how to price material ESG risk into cost of capital decision-making. More longitudinal research would be needed to develop this hypothesis (i.e. testing to see changes in the correlation coefficient over time).

Sector analysis

Deeper investigation

To assess whether the overall relationship holds up across industries, we segmented the 3,542 companies in our sample into their respective sectors[27] and calculated the correlation coefficient between ESG Risk Rating scores and WACC values. We also took a look at each sector's average WACC and ESG score, as well as the standard deviation of each. The results of our analysis are presented in Figure 7.

The correlation coefficient within sectors tends to be weak

We see three key storylines in the data. First, most sectors follow the overall trend, which is to say the correlation coefficient between ESG Risk Rating scores and WACC values is weak and tends to hover around 0.

Correlation appears to be strongest in two sectors

The correlation appears to be strongest in the Healthcare and Chemicals and Technology, Media and Telecom sectors, where the coefficients are 0.16 and 0.15 respectively. While these values are still indicative of a weak relationship, they are much stronger than the coefficients in other sectors. This finding could suggest that ESG risk and WACC values are, for whatever reason, more likely to move in the same direction in these sectors than in others.

Figure 7: Relationship between WACC and ESG Risk Rating scores within sectors

Sector	Number of companies	WACC		ESG Risk Rating scores		Correlation coefficient
		Average	Standard deviation	Average	Standard deviation	
Consumer Goods	526	8.4	2.7	23.4	8.5	-0.03
Extractives and Utilities	505	8.4	3.3	36.6	10.5	0.02
Financials	816	7.1	3.1	23.1	5.9	0.02
Healthcare and Chemicals	438	9.2	2.4	28.9	8.0	0.16
Industrials & Infrastructure	721	8.6	2.8	27.6	9.0	-0.01
Technology, Media and Telecom	536	9.6	3.3	20.0	5.5	0.15
Overall	3,542	8.4	3.1	26.2	9.4	0.03

Source: Sustainalytics, Bloomberg Financial, L.P.[28]

Absolute levels of ESG risk do not appear to make any significant difference

Second, the fact that some sectors are much risker than others from an ESG point of view does not appear to make any significant difference in the correlation between ESG risk and WACC. For instance, the Extractives and Utilities sector and Financials sector have an identical correlation coefficient (0.02) even though they are separated by over 13 points of ESG risk (average ESG Risk rating scores of 36.6 and 23.1, respectively). Thus, it does not appear that the market is particularly effective or ineffective at pricing unmanaged risk into the cost of capital in higher risk sectors.

WACC values tend to be clustered irrespective of the sector's ESG risk profile

Finally, the standard deviation data in Figure 7 reconfirms the overall picture. WACC values do not appear to be any more or less variable in sectors with high or low ESG risk. WACC values tend to be clustered irrespective of the sector's ESG risk profile. The standard deviation of WACC values ranges from 2.4 (Healthcare and Chemicals) to 3.3 (Extractives and Utilities and Technology, Media and Telecom).

Measuring an ESG risk premium

Adding an ESG risk premium

The lack of a correlation between ESG risk scores and WACC values suggests that investors may find value in adding an ESG risk premium in DCF models. In the section below we outline a simplified approach that investors could potentially take to create ESG risk-adjusted WACC values.

Investors may benefit from adding an ESG risk premium

For the purposes of this brief overview, Sustainalytics took the straightforward approach of applying static WACC adjustment factors based on a company's ESG Risk Rating category (we refer to these factors as the ESG risk premium). The mapping is as follows:

- negligible = -50 bps
- low = -25 bps
- medium = unchanged
- high = +25 bps, and
- severe = +50 bps.

While they seemed to us like a reasonable starting point, these factors are ultimately arbitrary and could be increased (decreased) to amplify (dampen) the contribution of the ESG risk premium on a company's final WACC value.

To test the effects of incorporating an ESG risk premium in a company's WACC we built a simplified DCF model that discounts companies' consensus forecasted FCF in 2020 by both their conventional and ESG risk-adjusted WACC.[29]

Results

The NPV of Thomson Reuters Corp's estimated FCF in 2020 increases by 0.5%

Figure 8 shows the results of this process for five representative companies from the FTSE All-World index (one from each ESG Risk Rating category). The percentage change in the NPV of companies' estimated FCF in 2020 ranges from +0.5% to -0.4%.

At the top end, Thomson Reuters Corp, the Canadian publishing firm, has an ESG Risk Rating score of 8.7 and falls into the negligible risk category. The company's estimated WACC of 6.9 is therefore lowered by 50 bps to 6.4. This in turn increases the NPV of the company's constant consensus forecasted FCF in 2020 by 0.5%, from USD 907mn to 911mn.

The NPV of Rosneft's estimated FCF in 2020 decreases by 0.4%

At the low end, Rosneft, the Russian oil and gas major, has an ESG Risk Rating score of 41.0 and falls into the severe risk category. The company's estimated WACC of 14.0 is therefore increased by 50 bps to 14.5. This in turn decreases the NPV of the company's constant consensus forecasted FCF in 2020 by 0.4%, from USD 8,866mn to 8,827mn.

Figure 8: The effects of using ESG risk-adjusted WACC values

Company	ESG Risk Rating category	WACC	WACC adjustment	Adjusted WACC	FCF 2020E (USD mn)	NPV of FCF with WACC (USD mn)	NPV of FCF with adjusted WACC (USD mn)	Percentage change in NPV
Thomson Reuters Corp	Negligible	6.9	- 50 bps	6.4	970	907	911	0.5%
L'Oreal SA	Low	8.9	- 25 bps	8.6	4,910	4,509	4,520	0.2%
Roche Holding AG	Medium	9.3	0 bps	9.3	14,982	13,710	13,710	0.0%
Walmart Inc.	High	6.9	+ 25 bps	7.2	14,769	13,815	13,783	-0.2%
Rosneft	Severe	14.0	+ 50 bps	14.5	10,111	8,866	8,827	-0.4%

Source: Sustainalytics, Bloomberg Financial, L.P.[30]

A theoretical framework for investors to contemplate ESG risk premiums

This model is largely conceptual in the sense that it looks at only one year's worth of FCF estimates and leaves aside terminal value considerations. However, it provides a theoretical framework for investors to use as they contemplate ESG risk premiums and how they could be integrated into a DCF model. Even in our parsimonious model, the NPV effects are not insignificant, with a range of +0.5% to -0.4%, and they could easily be amplified by using more aggressive adjustment factors. The next step from a practical application point of view would be to integrate such changes into the portfolio construction process, which we leave outside of this relatively brief case study.

Variations

Investors could experiment with non-static WACC adjustment factors

The approach presented above shows how an ESG risk premium can be added to the WACC used as the discount rate in typical DCF model. As mentioned above, it is a simplified framework that could be built upon in many ways. Most obviously, investors could experiment with non-static WACC adjustment factors, such as those delivered through a factor optimization process. Investors could also segment WACC values into buckets, such as high, medium and low, and apply micro-adjustments to each. From an ESG perspective, investors could also consider using MEI-specific unmanaged risk scores to drive the WACC adjustment signal.

Conclusion – reinterpreting risk

A simple yet potent integration method

This chapter has shown that incorporating an ESG risk premium into the WACC value used to discount a company's FCF can potentially lead to significant changes in the valuation of that company, and may provide investors with a more holistic risk signal. Adjusting a company's WACC to capture unmanaged ESG risk is a simple yet potent method of integrating ESG information into financial analysis. The extent to which material ESG factors are already embedded in conventional WACC values is a deeply interesting and evolving question in the responsible investment community, and one that Sustainalytics is likely to further explore.

Smart beta ESG

Combining ESG scores and fundamental inputs

Blending ESG factors and fundamental inputs in a rules-based portfolio construction process

A third example of how investors could integrate the ESG Risk Ratings into their investment process is by blending ESG factors with fundamental inputs in a rules-based portfolio construction process, or what we refer to as smart beta ESG. Smart beta AUM have grown rapidly in recent years, up more than 630% from USD 136bn in 2007 to USD 1tn in 2017.[31] And as Sustainalytics, Aberdeen Standard Life and the University of Oxford found in a 2018 market study, a growing number of smart beta investors are combining conventional factor exposures with ESG information to differentiate their offerings and improve performance.[32]

Provoking further thinking about smart beta ESG

The possibilities for harnessing the ESG Risk Ratings in a smart beta strategy appear countless. The approach that we outline below is comparatively straightforward and is meant to provoke further thinking about how investors could blend ESG scores with financial ratios in a structured, rules-based manner.

Unpacking our approach

Constituents are drawn from the FTSE 100 index and reweighted

Our approach focuses on the FTSE 100 index.[33] Constituents are drawn from the index at the beginning of each portfolio year and reweighted according to their performance in a basic model that scores companies on two financial ratios and their ESG Risk Ratings score. The Sustainalytics' Smart Beta ESG FTSE 100 sample portfolio thus (largely) consists of the same constituents as the FTSE 100 but the constituent weights are altered to reflect companies' fundamentals and ESG risk profile. An overview of our approach is offered in Figure 9.

Portfolio construction process

Companies were scored against their sector peers

The precise portfolio construction process followed seven steps. First, companies were drawn from the FTSE 100 index as of December 31 of the year preceding each portfolio year (e.g. December 31, 2013 for the 2014 portfolio year, etc).[34] We ran the sample portfolio from 1 January 2014 to 31 December 2018 for a total of five years or 60 months.

Second, companies for which ESG Risk Rating scores were available[35] were grouped according to their Sustainalytics sector[36] and inverse ranked according to their ESG Risk Rating score.[37] To illustrate, ESG Risk Rating scores for the 19 Consumer Goods companies in the benchmark in the 2014 portfolio year ranged from 36.9 for Associated British Foods to 10.7 for Kingfisher. Associated British Foods was thus assigned an inverse rank of 1 and Kingfisher an inverse rank of 19.[38]

Figure 9: Overview of smart beta ESG portfolio construction process
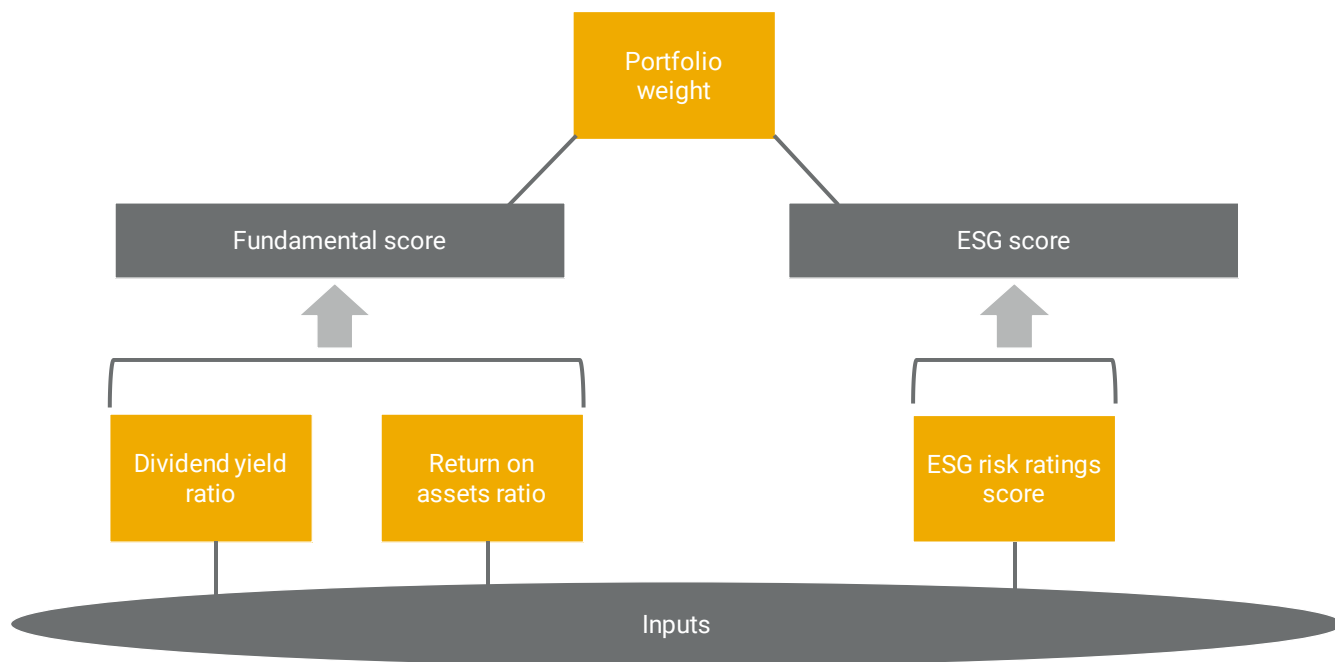
The fundamental score is driven by dividend yield and return on assets

Third, final ESG scores were calculated by dividing ESG inverse ranks by the number of companies in each sector. To carry on with the earlier example, Associated British Foods has a final ESG score of 0.053 (1/19 = 0.053), and Kingfisher 1 (19/19 = 1).

In the fourth step, steps two and three were repeated for dividend yield.[39] The dividend yield was calculated as of 1 January 2014 for the 2014 portfolio year, as of 1 January 2015 for the 2015 portfolio year, etc.[40]

In the fifth step, steps two and three were repeated for return on assets.[41] As with dividend yield, return on assets was calculated as of 1 January 2014 for the 2014 portfolio year, as of 1 January 2015 for the 2015 portfolio year, etc.[42]

We selected dividend yield and return on assets as inputs for the fundamental score because they are broadly applicable across industries, although there are clearly many other candidate ratios that could be substituted.[43]

Summing the scores

The fundamental score and final ESG score are equally weighted

In the sixth step, we calculated companies' fundamental score (dividend yield score + return on assets score) and their total score by summing their final ESG score and fundamental score.

Portfolio weight is based on a company's total score

In the seventh and final step, companies' portfolio weight was calculated by dividing their total score by the sum of all total scores. For instance, the highest weighted company in the 2014 portfolio year, Persimmon PLC, had a portfolio weight of 1.9%, which was derived from its total score of 2.7 against a total portfolio score of 144.7 (2.7/144.7 = 1.9%).

Holdings analysis

Average active weights range from +1.55% to -6.05%

In our approach, all FTSE 100 companies for which ESG scores were available ended up in the final portfolio, irrespective of their ESG or fundamental score. In other words, companies did not have to meet specified performance hurdles. Companies with lower total scores were underweighted in the portfolio; companies with higher total scores were overweighted. In the most recent (2018) portfolio year, portfolio weights ranged from 1.83% (National Grid PLC) to 0.12% (Barclays).

Active weights, which are the difference between a company's portfolio and index weight, varied significantly.[44] Average active weights (i.e. the average of active weights calculated across all five portfolio years) ranged from +1.55% (Persimmon Plc) to -6.05% (HSBC Holdings). In other words, relative to the FTSE 100 index, Persimmon Plc is the most overweighted holding in the Sustainalytics Smart Beta ESG FTSE 100 sample portfolio and HSBC Holdings is the most underweighted. Figure 10 shows a selection of holdings from the sample portfolio that demonstrate the range in average active weights.

Figure 10: Range of average active weights in the Sustainalytics Smart Beta ESG FTSE 100 sample portfolio

Company name	Sector	Average portfolio weight	Average index weight	Average active weight
Persimmon	Industrials & Infrastructure	1.90%	0.34%	1.55%
Marks & Spencer Group	Consumer Goods	1.26%	0.37%	0.89%
Sky	Technology, Media and Telecom	1.10%	0.57%	0.53%
BP	Extractives and Utilities	0.96%	4.87%	-3.91%
HSBC Holdings	Financials	0.85%	6.90%	-6.05%

Source: Sustainalytics, Bloomberg Financial, L.P.[45]

Returns analysis

Comparing the returns of the sample portfolio and benchmark

Figure 11 shows how the Smart Beta ESG FTSE 100 sample portfolio would have performed against the FTSE 100 index from a total return perspective during a 1 January 2014 to 31 December 2018 investment period. The portfolio had an active return of 3.4%, posting a total return of 24.5% compared to 21.1% for the benchmark.[46] However, the sample portfolio was slightly more volatile than the benchmark, with a standard deviation of daily returns of 13.4 compared to 13.0 for the FTSE 100 index.

The sample portfolio had a slightly higher Sharpe ratio

The Smart Beta ESG FTSE 100 sample portfolio had a higher Sharpe ratio than the benchmark over the full holding period (0.36 vs 0.32), indicating slightly improved risk-adjusted returns.

Figure 11: Smart Beta ESG FTSE 100 Sample Portfolio vs FTSE 100 index
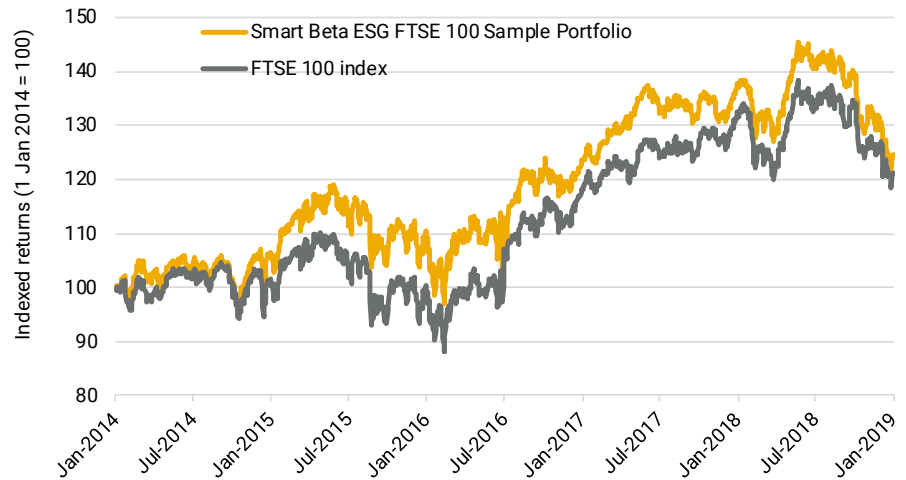
Source: Sustainalytics, Bloomberg Financial, L.P.[47]

Attribution analysis

Figure 12 breaks down the sample portfolio's active return of 3.4% into allocation, currency, interaction and selection effects using a conventional performance attribution model.[48] This analysis shows that interaction effects accounted for the bulk of the sample portfolio's outperformance (2.64%), followed by selection effects (0.70%), currency effects (0.05%) and allocation effects (0.01%).

Figure 12: Attribution analysis of the Smart Beta ESG FTSE 100 Sample Portfolio vs FTSE 100 index
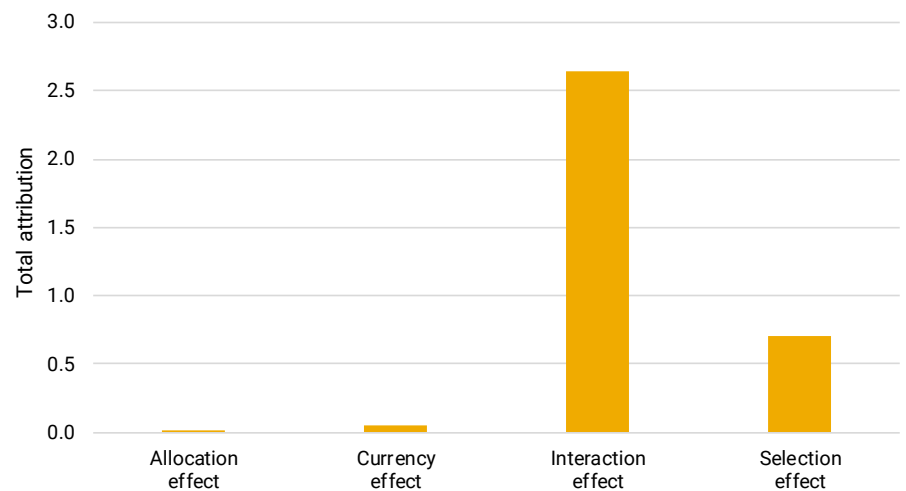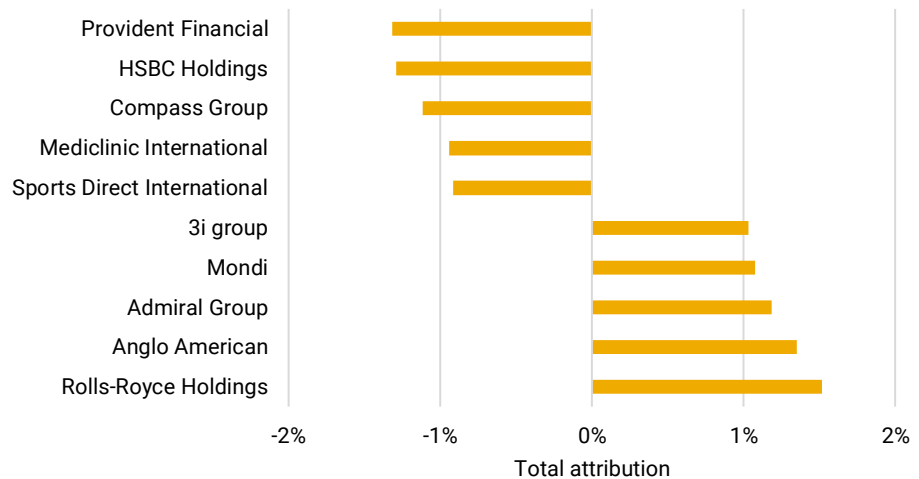

Source: Sustainalytics, Bloomberg Financial L.P.

Rolls-Royce Holdings had the highest positive total attribution

Figure 13 delves deeper and shows the securities with the five largest positive and negative contributions to the sample portfolio's active return. The security with the most significant positive contribution was Rolls-Royce Holdings, with a total attribution of 1.5%.

The effect of Rolls-Royce Holdings' underperformance was dampened

With an ESG Risk Rating score of 29.9, Rolls-Royce Holdings is a medium risk ESG firm and is on the cusp of slipping into the high-risk category. It also has a below average fundamentals score, due largely to its low dividend yield ratio. While the company posted a total return of -28.4% during the investment period, one of the lowest of any FTSE 100 constituent, it was underweighted in Sustainalytics' sample portfolios by 20 bps, on average, relative to the FTSE 100 index. The sample portfolio's emphasis on dividend yield, return on assets and ESG scores helped dampen the effect of Rolls-Royce Holdings' underperformance during the investment period.

Figure 13: Contributions to active return of the Smart Beta ESG FTSE 100 Sample Portfolio

Source: Sustainalytics, Bloomberg Financial, L.P.

Provident Financial had the largest negative total attribution

At the other extreme, Provident Financial had the largest negative total attribution (-1.3%). Provident Financial is a medium ESG risk firm, with an ESG Risk Rating score of 22.6, but the company performed relatively well in our fundamental assessment. As a result, the company was overweighted in the sample portfolios by an average of 30 bps relative to the benchmark. However, the company posted a total return of -72.5% during the investment period, the lowest of any FTSE 100 constituent. In this particular case, the focus on dividend yield, return on assets and, to a lesser extent, ESG scores, resulted in a drag on the sample portfolio's performance.

We constructed two additional portfolios to test the incremental benefit of each score input

Does the ESG score add incremental value?

Perhaps a more intriguing attribution question, particularly for investors who are accustomed to smart beta ESG strategies, is the incremental benefit of the ESG score and fundamental score in the performance of Sustainalytics' sample portfolio. In other words, how would the sample portfolio have performed if one of these scores were removed?

To answer this question, we created two additional portfolios: the Fundamental sample portfolio, which is driven exclusively by companies' fundamental score, and the ESG sample portfolio, which is driven exclusively by companies' ESG score. These portfolios follow the same construction methodology as the main portfolio (i.e. the Smart Beta ESG FTSE 100 sample portfolio) but they rely on a single input. The performance of these additional sample portfolios is shown in Figure 14.

Figure 14: Comparing financial returns across sample portfolios

Measure	FTSE 100 Index	Smart Beta ESG FTSE 100 Sample Portfolio	Fundamental Sample Portfolio	ESG Sample Portfolio
Total return	21.1%	24.5%	24.2%	25.1%
Active return	-	3.4%	3.1%	4.1%
Standard deviation	13.0	13.4	13.5	13.3
Sharpe ratio	0.32	0.36	0.35	0.36

Source: Sustainalytics, Bloomberg Financial, L.P.

The ESG sample portfolio had the highest total return

The additional sample portfolios (also) outperformed the benchmark, with an active return of 3.1% (Fundamental) and 4.1% (ESG). However, only the latter added incremental value against the Smart Beta ESG FTSE 100 sample portfolio (i.e. the ESG sample portfolio outperformed the main sample portfolio, but the fundamental sample portfolio did not). While we would not expect an alternative indexing strategy driven exclusively by ESG data to necessarily outperform across all markets and investment periods, in our analysis the marginal benefit of the ESG signal was much more significant than that of the fundamental signal. Indeed, the ESG sample portfolio outperformed the Fundamental sample portfolio by nearly a full percentage point (25.1% vs 24.2%).

The sample portfolios had a higher Sharpe ratio than the benchmark

The Sharpe ratio of all three sample portfolios exceeded that of the FTSE 100 index, albeit marginally. The main and ESG sample portfolios both had a Sharpe ratio of 0.36 over the full holding period, compared to 0.35 for the Fundamental sample portfolio and 0.32 for the benchmark.

The ESG sample portfolio had the lowest volatility

The sample portfolios all had a higher standard deviation of daily returns than the benchmark, indicating that their outperformance came at the expense of an increase in volatility. Once again, we find that the ESG sample portfolio is the top performer. Its standard deviation of daily returns, 13.3, is the lowest among the three sample portfolios, although it is higher than that of the benchmark (13.0).

ESG as a standalone factor?

Although based on a limited investment period of 5 years, this analysis suggests that ESG scores could potentially be used as a standalone factor in smart beta ESG strategies. Indeed, in the aforementioned 2018 market study conducted by Sustainalytics, Aberdeen Standard Life and the University of Oxford, we found that a growing number of investors are experimenting with ESG data as a source of risk premium.[49]

Variations

There are numerous ways to design and implement smart beta ESG

The smart beta ESG approach introduced above is a simplified strategy that is meant to provoke ideas about how the ESG Risk Ratings could be blended with financial ratios in a rules-based indexing strategy. Clearly there are numerous variations to this exercise. First and foremost, investors could explore different combinations of fundamental inputs, including those with recognized risk premia such as volatility, momentum and quality.

Investors could also consider overlaying specific ESG criteria or performance hurdles into the security selection process. For instance, investors could remove from the investable universe companies that are experiencing, or have (recently) experienced, a Category 4 or 5 controversy.[50]

Ensuring the portfolio is industry neutral

Another possibility would be to ensure that the portfolio is industry neutral relative to the benchmark, which is comparable to a best-in-class approach. This constraint would presumably constrain the ESG signal, recognizing, as mentioned earlier, that industries have vastly different ESG risk profiles. But it could potentially help reduce tracking error.

Other variations include using a different weighting scheme, for example by overweighting the ESG score relative to the fundamental score or comparing ESG Risk Rating scores across industries rather than against same-sector peers as we did.

Conclusion – blending portfolio inputs

Our findings demonstrate the potential of smart beta ESG

This chapter offers a basic framework for blending unmanaged risk scores with financial ratios in a rules-based portfolio construction process. The returns analysis of the three sample portfolios – the Smart Beta ESG FTSE 100 sample portfolio, the Fundamental sample portfolio and the ESG sample portfolio – suggests that smart beta ESG can potentially help investors improve performance against market benchmarks. Given the perceived advantages of smart beta strategies over active and conventional passive strategies,[51] and the growing materiality of ESG factors, we expect a growing number of investors to explore smart beta ESG in the future.

Best-in-class strategies

Selecting top ESG performers

All industries are typically eligible with BIC strategies

Best-in-class (BIC) typically involves building a concentrated portfolio of top ESG performers using ESG ranking hurdles. It is distinct from negative screening in that all industries are typically eligible for inclusion in the investment universe, although many investors combine BIC with negative screens that remove companies that meet specific screening criteria.

Layers of information

We used three considerations to set up a BIC strategy

As shown in Figure 15, three considerations that are often part of BIC strategy formulation relate to industry, market and company-specific measure(s) used to determine best-in-class. More filters lead to greater specificity and more concentrated strategies, but a smaller number of qualifying companies.

Figure 15: Three layers of information in BIC strategy formulation
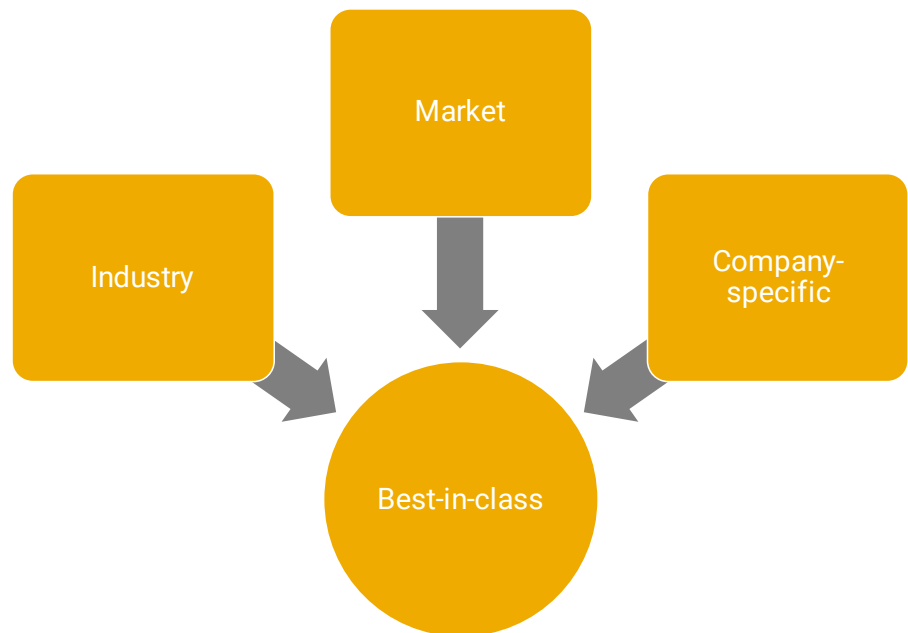
Source: Sustainalytics

Industry

BIC strategies can be run across or within industries

The first layer relates to industry boundaries. BIC strategies are typically run across industries, but they can also be deployed within specific sectors. The ESG Risk Ratings cover companies in 138 unique subindustries and can thus be deployed in highly specialized BIC strategies.

Market

There is a trade-off between precision and universe size

Like the industry layer, the market layer involves boundary setting. Should the strategy consider companies across all geographies? Or should it target companies based in specific countries or regions? There is a trade-off between precision and sample size: country-specific BIC strategies may be more exact, but by definition they will restrict the size of the investment universe.

Company-specific

The ESG Risk Ratings offer a plethora of metrics for use in BIC strategies

The third layer relates to how "best-in-class" is determined. In the context of the ESG Risk Ratings, top-of-mind measures might include overall unmanaged risk scores, management scores and exposure scores. Moving up the precision curve, more tailored metrics might include MEI-specific unmanaged risk scores, which could be applied on an industry-specific basis, and management indicators that underlie MEI analysis, such as employee turnover rates or carbon intensity metrics.

In addition to the measure used to define BIC, there is a question of how high to set the bar. Commonly used thresholds include the top 10%, 40% or 50% of performers from a starting investment universe (for example, the top 10% of companies from the FTSE All-World Index based on overall unmanaged risk scores). The threshold decision depends on many factors, such as the effects on portfolio diversification of applying more stringent thresholds.

A wide range of BIC strategies

Strategies range from the micro to the broad

The versatility of the ESG Risk Ratings allows investors to pursue any number of BIC strategies, from the micro (for instance, German automobile manufacturers with a top decile score on the product and service safety programmes indicator) to the narrow (North American banks and insurance firms with a top decile unmanaged risk score on the Business Ethics MEI) to the broad (global companies with top percentile unmanaged risk scores by sector).

Tracking error

Tracking error limitations can constrain BIC

Tracking error is an important discussion point in BIC strategies, as implementing BIC can lead to significant deviation from conventional benchmarks, including market cap-weighted indices.[52] As a result, tracking error constraints, such as those sometimes imposed by asset owner mandates, can limit the degree to which managers can apply BIC strategies.

Some variants of BIC relax tracking error constraints or remove them entirely, thus allowing managers greater flexibility to deviate from market indices. Such strategies, which are typically found in dedicated funds, allow for deeper and more prolonged ESG integration across their portfolio companies.

Financial performance

We contribute to a large and growing body of literature

There is a large and growing body of literature that investigates whether BIC strategies are associated with market outperformance.[53] Sustainalytics seeks to contribute to this discussion through rigorous empirical testing of the ESG Risk

Ratings, the results of which were first introduced in the Volume 1 white paper.[54] Below we summarize our findings as they pertain to BIC analysis.

Conventional vs momentum

8 x 3 x 2 = 48 unique BIC strategies

Our empirical evaluation of the ESG Risk Ratings included the development and testing of 48 discrete BIC strategies. They were based on eight MEIs across three markets and included two distinct types of BIC (conventional BIC and BIC momentum).[55]

A 30% ranking hurdle

While the first two inputs (MEIs and markets) are straightforward, further explanation is needed to differentiate the BIC types. The first is a conventional BIC that uses a 30% ranking hurdle (i.e. the top 30% of companies operating in industries where the MEI was relevant were selected to the portfolio). Performance was based on companies' MEI-specific unmanaged risk scores.

The BIC momentum portfolios select companies improving the most

The second type is BIC momentum. Companies were selected to these portfolios based on the improvement in their MEI-specific unmanaged risk score, rather than their absolute score. The intent was to capture those companies making the most rapid gains in their MEI performance, not necessarily those with the lowest level of unmanaged risk in absolute terms. As with the conventional BIC portfolios, the momentum portfolios used a 30% ranking hurdle and were run across all industries for which the MEI was relevant. Figure 16 provides a summary of the BIC portfolio inputs.

Figure 16: Overview of BIC portfolio inputs

MEI	Market	Type
Business Ethics	APAC	Conventional
Carbon - Own Operations	Europe	Momentum
E&S Impact of Products and Services	North America	
Emissions, Effluents and Waste		
ESG Integration – Financials		
Human Capital		
Occupational Health and Safety		
Resource Use		

Source: Sustainalytics

Investment period

Different investment period for each type of BIC strategy

The investment period for the conventional BIC portfolios ran from January 2010 to June 2018, for a total of 102 months. The constituents were refreshed on 31 December of the year preceding each portfolio year (e.g. December 31, 2017 for the 2018 portfolio year), and performance measurement began on 1 January of each portfolio year.[56] Constituents were selected based on their MEI-specific unmanaged risk score in the year preceding each portfolio year. The BIC portfolios were market-cap weighted.

BIC momentum looks at year over year improvements

The BIC momentum portfolios were tested from January 2011 to June 2018, for a total of 90 months.[57] As with the regular BIC portfolios, the constituents were refreshed on 31 December of the year preceding each portfolio year, but the criterion was the improvement in MEI-specific unmanaged risk scores. The BIC momentum portfolios were also market-cap weighted.

Benchmark

**We used the Carhart model to determine abnormal returns**

An important consideration in any empirical test is determining the benchmark against which to measure the abnormal return of a portfolio. Looking at equity markets, the Capital Asset Pricing Model (CAPM) has traditionally been used for this purpose. It was later replaced by multi-factor models, such as the so-called Fama/French three-factor model. This, in turn, was superseded by an augmented four-factor version, which is now known as the Carhart model.[58] Over the past decade, in both academic literature and the quant practitioners' world, this model has become the quasi standard for measuring risk-adjusted abnormal returns, i.e. alpha. Therefore, we used it to evaluate the performance of our ESG Risk Ratings-based investment strategies.[59]

Results

Momentum strategies outperformed conventional BIC

Of the 48 BIC portfolios analyzed for the purposes of this paper, 21 (44%) were found to have statistically significant positive alpha, with annualized alpha ranging from 11.8 to 2.3. Figure 17 shows the three best performing strategies by region.

Figure 17: Top three strategies by region, Carhart model-based alphas in % p.a.*
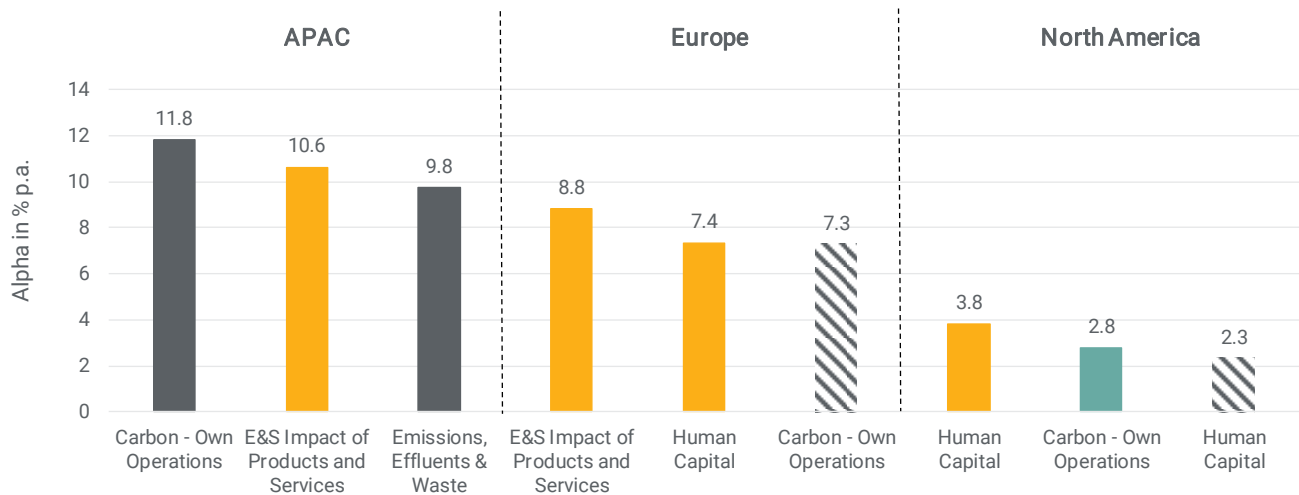
*Gold columns: statistically significant at 1% level; grey columns: 5% level; teal columns: 10% level; Solid colours indicate BIC momentum strategies; diagonal stripes indicate conventional BIC.

Source: Sustainalytics

Momentum strategies outperformed conventional BIC

Three takeaways are immediately clear. First, the BIC momentum strategies, represented in Figure 17 by the bars with solid colours, outperformed the conventional BIC portfolios. Of the nine strategies shown in Figure 17, all but two (Carbon – Own Operations in Europe and Human Capital in North America) are momentum-based. This finding may indicate that, in the context of BIC strategies, the trendline in companies' ESG performance is more closely associated with alpha generation than companies' absolute (i.e. current) ESG performance.

Of the BIC strategies created for this study, those in APAC performed best

Second, for the BIC strategies used in this study, the APAC region had the best performance. The three top APAC strategies have an average alpha of 10.7, compared to 7.8 for Europe and 3.0 for North America. This relationship also holds up across the full sample of 48 BIC strategies.[60] These findings may indicate that some markets are more mature at pricing in ESG-related factors than others, although it is beyond the scope of this paper to review this question in detail.

Carbon – Own Operations is relatively pervasive

Finally, Carbon – Own Operations is the only MEI that shows up as a top performing strategy across all three regions. This may indicate that carbon-related risks, such as those posed by energy transition, are more systematic than risk factors captured in other MEIs.

Conclusion – delivering value through BIC

Our results point to many possibilities for using the ESG Risk Ratings in BIC

BIC strategies are a staple among the growing multitude of approaches for integrating ESG information into portfolio decision-making, and the ESG Risk Ratings are well-suited to contribute new innovations in this long-favoured integration technique.

Of the 48 BIC portfolios that we evaluated in our empirical testing, 21 (44%) were found to have statistically significant positive alpha, ranging from 11.8 to 2.3 on an annualized basis. While further research is needed to answer some of the questions raised by our results, we believe they are encouraging and point to many advantageous possibilities for using the ESG Risk Ratings in BIC strategy development.

Screening techniques

Narrowing the investable universe

Screening is the most common ESG integration technique

Screening is typically understood to involve eliminating companies or entire industries from an investor's investable universe based on specific ESG criteria. Common examples include removing companies with products connected to tobacco, alcohol, gambling, cluster munitions, animal testing or child labour. Negative screening is the most common ESG integration technique, accounting for approximately 36% of all ESG integration strategies.[61]

Screening can be based on an investment logic

Motivations for screening can range from ethical concerns to financial value considerations.[62] An emblematic example is screening companies with exposure to thermal coal. Of course, ethical and investment motivations are not mutually exclusive, and investors can have different reasons for removing the same companies from their investable universe.

Effect on returns

Does screening imperil returns?

The extent to which screening affects the risk/return characteristics of a portfolio is a longstanding question in the responsible investing (RI) community, particularly in the context of stripping out entire industries. While we do not wish to revisit this debate, it is worth mentioning that modern portfolio theory's assumption that constraining the investment universe necessarily leads to underperformance has recently come under assault from an empirical point of view.

Maintaining sufficient portfolio diversification

Among several recent studies questioning the risk/return effects of screening, Jeremy Grantham of GMO investments presented long-term data that showed removing entire sectors from the investable universe of a US equity investor would have yielded only minor effects (i.e. less than 50 bps) on annualized absolute returns stretching back to 1989.[63] Although this type of analysis is sensitive to changes in time frame, the methodology for measuring returns and other factors, these findings are consistent with a growing body of evidence suggesting that sufficient portfolio diversification can be achieved while screening out specific sectors.[64]

Screening with the ESG Risk Ratings

Various ways to deploy the ESG Risk Ratings in screening strategies

The ESG Risk Ratings could be used to facilitate portfolio screening in many different ways. Due to their cross-sector comparability, the ESG Risk Ratings are well-suited for screening at the universe level. The MEI structure of the ratings also provides opportunity for thematic screening. Examples include:

- Removing companies with an overall unmanaged risk score in the severe ESG risk category;
- Removing companies with an overall unmanaged risk score above a specific threshold, such as companies with a top decile overall unmanaged risk score within their respective subindustry;
- Removing entire subindustries with an average unmanaged risk score above a specific threshold, such as subindustries with a top quartile average unmanaged risk score;
- Removing companies with an unmanaged risk score in the severe ESG risk category on a particular MEI, such as Data Privacy and Security.

Clearly, these strategies would have varied diversification and tracking error effects, and investors would need to balance these considerations with the screening rationale in portfolio construction.

Unmanageable risk

That portion of a company's risk exposure that cannot be managed away

While the screening strategies listed above are intuitive and could succeed in reducing portfolio-level ESG risk, we demonstrate below an alternative approach that is based on unmanageable risk.[65] Unmanageable risk is that portion of a company's ESG risk exposure that cannot be managed away through relevant policies, programmes or initiatives. Referring once again to the decomposition of the ESG Risk Ratings in Figure 2, unmanageable risk is the difference between a company's exposure to a given MEI and that portion of the exposure that is manageable (i.e. manageable risk).

Coal companies cannot fully manage away carbon emission risks without exiting the industry

To unpack this concept in practice, let us consider the example of the coal industry and the MEI of Carbon – Products and Services. Coal companies cannot fully manage the carbon emission risks of coal without exiting the coal business. Coal will continue to emit carbon when burned, irrespective of management initiatives, such as efficiency improvements, that may reduce these emissions. The only option to fully manage the carbon emission risks of coal would be to diversify out of the coal business. Indeed, in Sustainalytics' view, 60% of the Coal subindustry's exposure to the Carbon – Products and Services MEI is unmanageable.

The long-term shift to sustainability

A screening strategy based on unmanageable risk therefore targets subindustries whose constituent firms may struggle, relatively speaking, in adjusting to a broad, long-term shift to a more sustainable economy.

Implementing a screened portfolio

The sample portfolio is based on the FTSE All-World index

To test the effects that screening based on unmanageable risk could potentially have on both portfolio ESG risk and portfolio returns, we created a sample portfolio (the Sustainalytics Unmanageable Risk Screened Sample Portfolio). The portfolio seeks to mirror the FTSE All-World index except that constituents operating in subindustries with a significant amount of unmanageable risk are excluded.

Average unmanageable risk values range from 7.9 to 0

The precise portfolio construction process followed three steps. First, we determined which subindustries to screen out by calculating each subindustry's average unmanageable risk. Average manageable risk is calculated as the difference between a subindustry's average exposure score and the average overall manageable risk of all companies in that subindustry. At the company level, overall manageable risk is defined as the amount of ESG exposure a company can actually manage after accounting for structural issues, such as inherent negative externalities (e.g. the health risks of smoking).[66]

Average unmanageable risk values range from a high of 7.9 (Integrated Oil & Gas) to a low of 0 (Real Estate Services), with an overall average of 2.6 and a standard deviation of 1.7. For the sample portfolio we set a threshold of 5: any subindustry with an average unmanageable risk score of 5 or higher was eliminated from the investable universe. As shown in Figure 18, this approach screens out companies in 18 subindustries.

Figure 18: Subindustries screened using average unmanageable risk

Screened subindustries	Average Exposure score	Average Manageable risk	Average Unmanageable risk
Integrated Oil & Gas	75.5	67.6	7.9
Oil & Gas Exploration and Production	71.8	64.3	7.5
Oil & Gas Refining and Marketing	57.1	50.2	7.0
Coal	56.5	49.6	6.9
Conglomerates	63.1	56.2	6.9
Airlines	49.5	42.7	6.8
Agricultural Chemicals	63.7	57.4	6.4
Tobacco	32.2	26.0	6.2
Diversified Chemicals	55.6	50.0	5.6
Specialty Chemicals	54.0	48.6	5.4
Diversified Metals Mining	72.0	66.6	5.4
Aerospace and Defence	56.5	51.1	5.4
Precious Metals Mining	71.2	65.8	5.3
Gold	69.6	64.4	5.2
Aluminum	68.9	63.7	5.2
Commodity Chemicals	45.1	40.0	5.2
Construction Materials	50.4	45.4	5.0
Oil & Gas Storage and Transportation	47.1	42.1	5.0

Source: Sustainalytics[67]

Constituents taken from the benchmark on 31 December

Second, we took constituents from the FTSE All-World index as of the close of 31 December before each portfolio year (2014 – 2018) and removed those that were classified in the 18 screened subindustries.[68] On average, 418 constituents were removed each year as a result of the screen.

The sample portfolio had an average of 2,258 names

In the final step, we reweighted the remaining benchmark constituents on a market cap-weighted basis. The sample portfolio had an average size of 2,258 names compared to 2,889 for the FTSE All-World index.[69]

Figure 19: Comparing returns and ESG scores

Measure	FTSE All-World Index	Unmanageable Risk Screened Sample Portfolio
ESG Risk Rating Score	23.6	22.9
ESG risk reduction	-	-3.1%
Total return	27.2%	32.9%
Active return	-	5.7%
Standard deviation	15.4	16.6
Sharpe ratio	0.45	0.54

Source: Sustainalytics, Bloomberg Financial, L.P., Vanguard[70]

Results

The sample portfolio achieved a 3.1% reduction in ESG risk

As shown in Figure 19, the Unmanageable Risk Screened Sample Portfolio has an ESG Risk Rating score of 22.9, which represents the sum of the weighted ESG Risk Rating scores for all companies in the portfolio. This represents a 3.1% reduction from the benchmark's ESG score of 23.6. This outcome comes as no surprise as the 18 subindustries that are absent in the sample portfolio contain many of the highest ESG risk companies in Sustainalytics' coverage universe.

The sample portfolio had a positive active return of 5.7%

In addition to outperforming from an ESG risk point of view, the sample portfolio had a positive active return of 5.7% relative to the benchmark over the full investment period, based on a total return of 32.9% compared to 27.2% for the FTSE All-World index.[71]

The sample portfolio also outperformed from a risk-adjusted point of view, with a Sharpe ratio of 0.54 over the full holding period compared to 0.45 for the benchmark.

The sample portfolio is underweight Oil & Gas stocks

The outperformance of the sample portfolio should be interpreted in the context of global oil prices, which declined from USD 97.49 per barrel at the start of the investment period to USD 33.62 about two years later.[72] Although prices began recovering at this point, they are still well below their January 2014 levels and this trend almost certainly aided the performance of the sample portfolio, which is significantly underweight Oil & Gas stocks.[73]

An increase in volatility

Similar to other sample portfolios, the outperformance of the Unmanageable Risk Screened Sample Portfolio came at the expense of an increase in volatility. As shown in Figure 19, the portfolio's standard deviation of daily returns was 16.6 over the investment period, compared to 15.4 for the benchmark.

Figure 20: Unmanageable Risk Screened Sample Portfolio vs FTSE All-World index
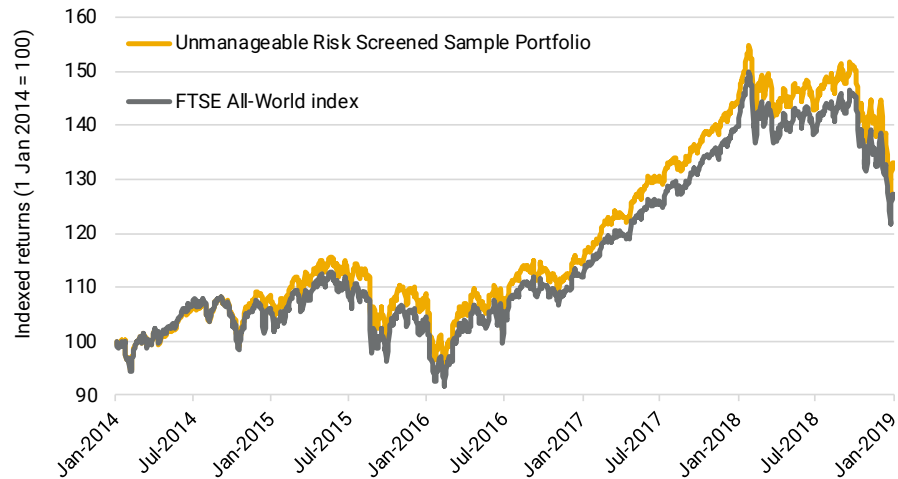
Attribution

Allocation effects accounted for most of the sample portfolio's active return

As shown in Figure 21, allocation effects (5.44%) and interaction effects (5.32%) had the most significant positive contributions to the sample portfolio's outperformance. The significant allocation effect was expected, as the sample portfolio has removed companies in 18 subindustries from the benchmark, or approximately 418 companies in each portfolio year on average. Currency effects had a modest positive contribution (0.50%), while selection effects had a significantly negative contribution (-5.61%).

Figure 21: Attribution analysis of the Unmanageable Risk Screened Sample Portfolio vs FTSE All-World index
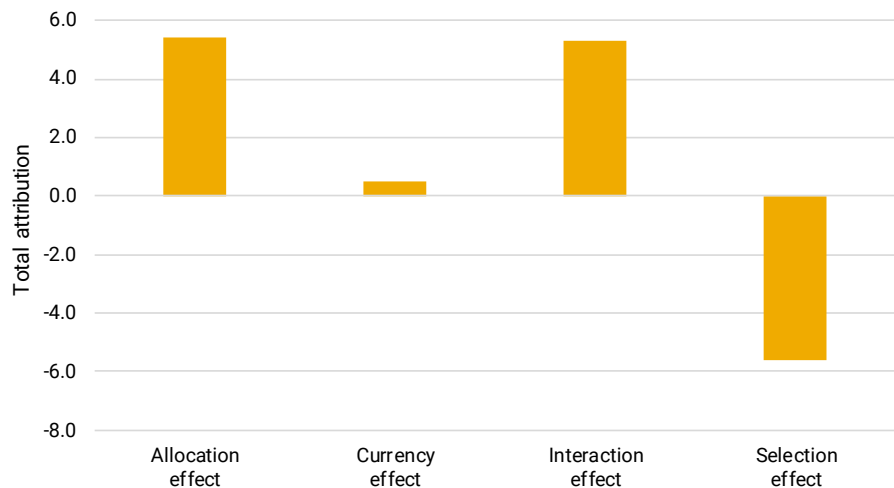
Variations

The ESG Risk Ratings offer many possibilities for screening strategies

The screening case study described above is clearly one of many that could be facilitated with the ESG Risk Ratings. As previously mentioned, investors could consider employing screening strategies at the universe level using overall unmanaged risk scores or score categories. Investors could also consider delving into MEI-level analysis and screening companies based on their performance on singular themes or issues, such as climate change. Portfolio screening is likely to remain a staple in the RI marketplace, and the ESG Risk Ratings appear to us to be well-suited to support a new generation of screening strategies.

Conclusion – screening subindustries

Contributing to the ongoing conversation

The results presented in this chapter provide initial evidence about the potential ESG risk reduction effects and outperformance benefits of screening strategies that harness the concept of unmanageable risk. The sample portfolio developed in this chapter, which removes companies in industries that may struggle, relatively speaking, in adjusting to a long-term pivot to sustainability, achieved an ESG risk reduction of 3.1%, a positive active return of 5.7% and a significantly improved Sharpe ratio (0.54 vs 0.45) compared to the benchmark over the full investment period. We hope the results contributed in this chapter contribute to ongoing conversations in the RI community about the risk/return effects of screening.

Thematic investing

Maximizing impact, minimizing risk

Selecting investments from the top down

Thematic investing typically involves taking a top-down view of the economy and selecting investments that will benefit if the investor's predictions develop as expected. Themes can be general, such as macroeconomic shifts or demographic changes, or targeted around individual topics, such as obesity, widening income gaps or specific technologies, such as blockchain.
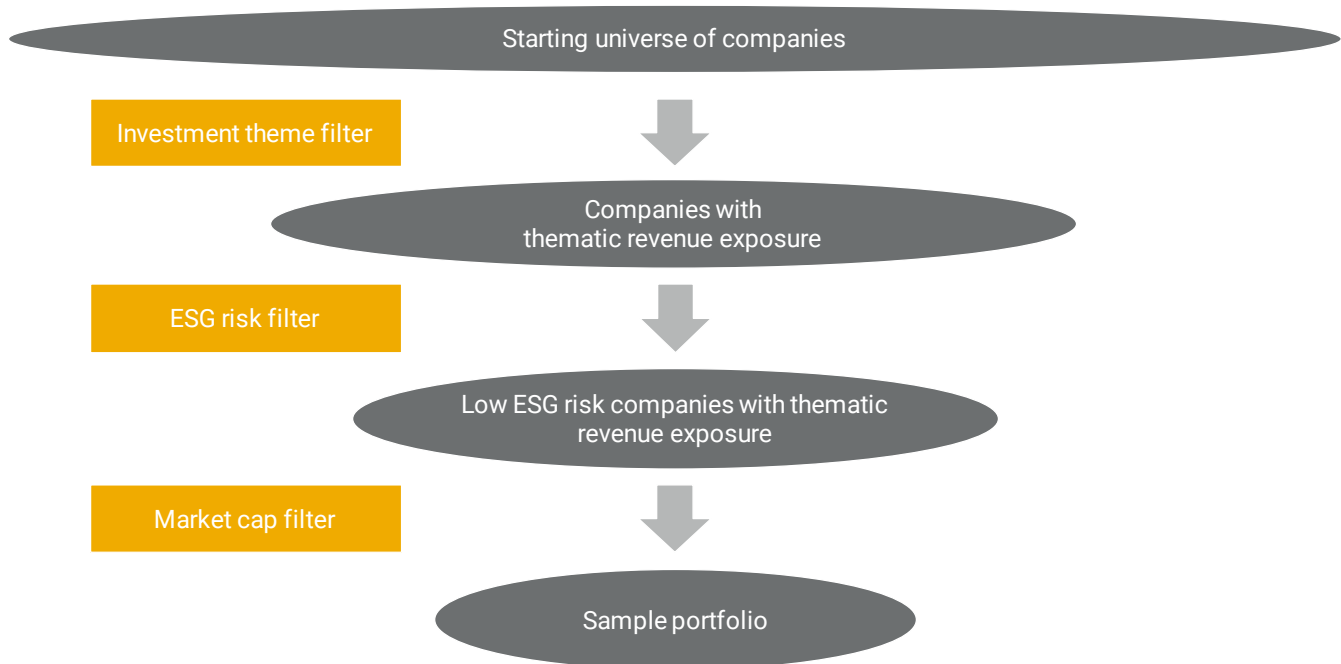
Many important investment themes have an ESG angle

Many of the most dynamic trends taking place in today's economy are ESG-related. The explosion in renewable energy technologies (new renewable energy capacity hit 157 gigawatts in 2017, more than double new fossil fuel capacity),[76] the surge of electric vehicles, the proliferation of water scarcity solutions, clean tech and the rise of healthy eating are prominent examples of top-down ESG-related investment themes.

Positive impact and ESG risk minimization

The thematic investing approach that we developed for this white paper combines two main elements: exposure to upside thematic opportunities that deliver positive social or environmental impact, and ESG risk minimization. A schematic of our approach is provided in Figure 22.

Figure 22: Overview of thematic investing framework

Starting universe of companies

Investment theme filter

Companies with thematic revenue exposure

ESG risk filter

Low ESG risk companies with thematic revenue exposure

Market cap filter

Sample portfolio

Source: Sustainalytics

Two information streams

The benefit of two information streams

The rationale of this approach is that it seeks to give investors exposure to upside ESG themes, but in a way that minimizes portfolio ESG risk. It is based on the recognition that companies that perform well in one area do not always perform well in the other.

High ESG risk companies can sell products or services with a sustainability upside

For instance, the ESG Risk Ratings offer a comprehensive ESG assessment and signal how companies are performing relative to their global subindustry peers on ESG issues that are material for that subindustry. But there is no guarantee that low ESG risk firms offer products or services with environmental or social upside.

On the other hand, it is entirely possible for high ESG risk companies to sell products or services that deliver positive environmental or social impacts. For instance, many of the companies positioned to benefit on the renewable energy theme are utilities, a subindustry that has inherently high ESG risk exposure.

The approach that we developed is an integrated impact strategy that targets top performers in both areas.

Constructing a sample portfolio

We ran the sample portfolio for a total of 60 months

To test how the thematic investing strategy that we developed for this white paper would have performed from a financial return standpoint we created a sample portfolio (the Sustainable Products Low ESG Risk Sample Portfolio) and ran it from 1 January 2014 to 31 December 2018 for a total of five years or 60 months.

A concentrated basket of 27 companies

The construction process followed three steps.

- We first scanned Sustainalytics' Sustainable Products Research database and selected all companies in the maximum revenue exposure category for any theme.[77]
- Next, we overlayed ESG Risk Rating scores and filtered out companies with a score in the medium, high or severe risk categories.
- Finally, to improve comparability against the FTSE All-World index, we imposed a minimum market cap threshold of USD 2bn.[78]

The end result is a concentrated basket of 27 mid and large cap companies with low or negligible ESG risk and significant upside exposure to positive impact ESG themes. Companies in the sample portfolio were equally weighted and constituents were held constant across the five-year investment period. Portfolio weights were rebalanced on 31 December prior to each portfolio year.

Unpacking security selection

The security selection process in action

Figure 23 illustrates our security selection process. The themes in the first column are taken from Sustainalytics' Sustainable Products Research database. Companies in the second column are a sample of those that have maximum

revenue exposure to the respective theme (i.e. 50-100% of their total revenue) and pass the first step in the security selection process.[79]

Three steps in the construction of the sample portfolio

As shown in the third column, companies that pass the first step in the security selection process often exhibit significant differences in their ESG Risk Rating scores. For instance, of the three companies in Figure 23 with maximum revenue exposure to the energy efficiency theme, only one (Signify NV) has an ESG Risk Rating score in the negligible or low category.

The fourth column displays companies' market cap category.[80] As previously mentioned, we imposed a size constraint to improve comparability against the benchmark. Thus, relatively small firms with low ESG risk, such as Frasers Commercial Trust in the green buildings theme, were ineligible for inclusion in the sample portfolio.

Figure 23: Selection process for the Sustainable Products Low ESG Risk Sample Portfolio

| Theme	Companies with maximum revenue exposure	ESG Risk Rating category	Market cap category	Portfolio candidate?
Energy efficiency	Monolithic Power Systems	High	Mid cap	
	Nordic Semiconductor ASA	Medium	Small cap	
	Signify NV	Low	Mid cap	✓
Green buildings	Frasers Commercial Trust	Low	Small cap	
	SOHO China Ltd	Medium	Mid cap	
	Unibail-Rodamco SE	Negligible	Large cap	✓
Green transport	Getlink	Negligible	Mid cap	✓
	Stagecoach Group PLC	Low	Small cap	
	Tesla Inc	High	Large cap	
Renewable energy	Engie Brasil Energia S.A.	Low	Mid cap	✓
	Nordex SE	Medium	Small cap	
	RusHydro PJSC	High	Mid cap	
Water	American Water Works Co Inc	Medium	Large cap	
	CITIC Limited	Severe	Large cap	
	Xylem Inc	Low	Large cap	✓

Source: Sustainalytics

Results

The sample portfolio had a positive active return of 26.6%

Figure 24 compares the sample portfolio against the FTSE All-World index from 1 January 2014 to 31 December 2018.[81] During this investment period the Sustainable Products Low ESG Risk Sample Portfolio had a positive active return of 26.6%, with a total return of 53.9% compared to 27.2% for the benchmark. However, as expected, the sample portfolio was significantly more volatile with a standard deviation of return of 19.6 compared to 15.4 for the FTSE All-World index.

In addition to delivering a large positive active return, the sample portfolio also outperformed from a risk-adjusted return perspective. The Sustainable Products Low ESG Risk Sample Portfolio posted a Sharpe ratio of 0.71 across the full holding period, which is 26 points higher than the benchmark's ratio (0.45).

Figure 24: Sustainable Products Low ESG Risk Sample Portfolio vs FTSE All-World index
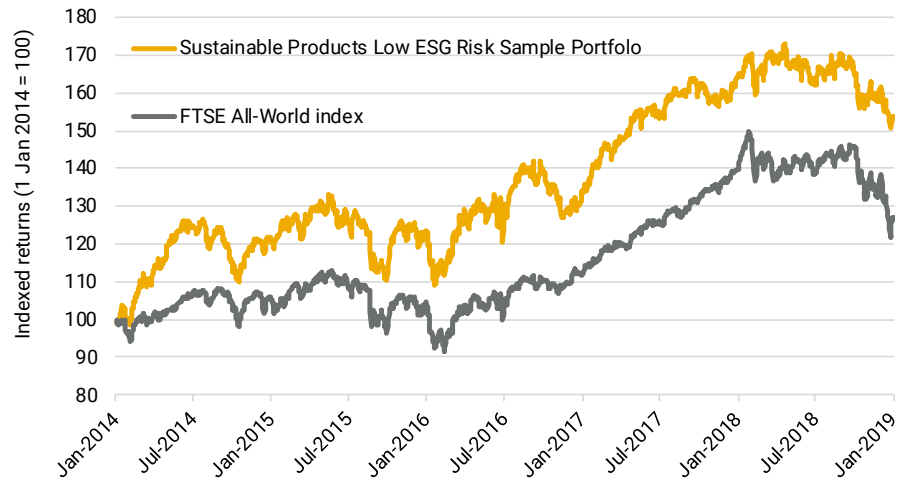
Attribution

Interaction and selection effects were the major drivers of the sample portfolio's active return

Attribution analysis shows that interaction effects (25.5%) and selection effects (14.9%) had the most significant positive contribution to the sample portfolio's active return. Allocation effects accounted for -0.8% and, given the diversified geographic nature of the sample portfolio, currency effects contributed -12.9% in attribution.

Figure 25: Attribution analysis of the Sustainable Products Low ESG Risk Sample Portfolio vs FTSE All-World index
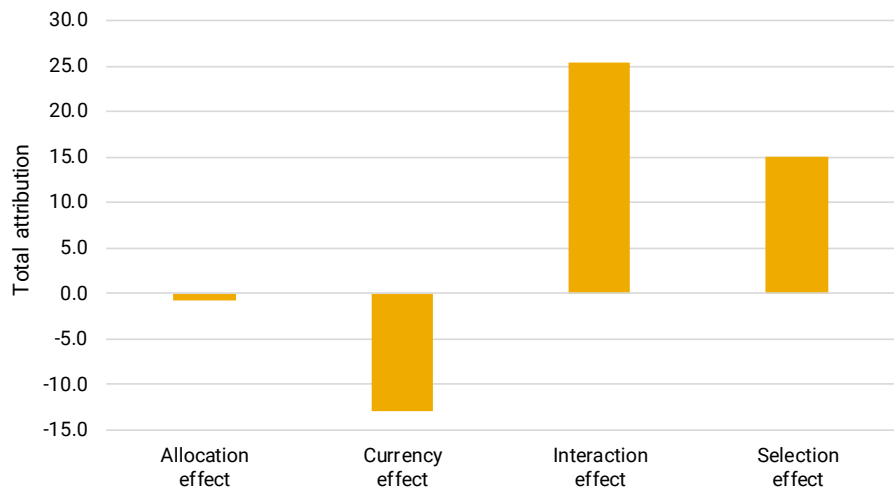
### Active subindustry weights

The sample portfolio is heavily overweight REITs

For the sake of simplicity, we did not hedge the industry exposure of the sample portfolio relative to the benchmark. And as it turned out, the sample portfolio had a significantly different industry composition than the benchmark. Figure 26 shows the average active weights of the Sustainable Products Low ESG Risk

Sample Portfolio by subindustry. The sample portfolio is heavily overweight REITs, which comprise 29.6% of the sample portfolio but only 1.8% of the FTSE All-World index.[83] The large active bet on REITs is a result of two factors: a) REITs are well-represented in Sustainalytics' Sustainable Products Research database; and b) REITs tend to have relatively low ESG Risk Rating scores.[84] Investors could address these active industry bets by setting industry caps to ensure sector neutrality against the benchmark.

Figure 26: Active subindustry weights in the Sustainalytics Sustainable Products Low ESG Risk Sample Portfolio
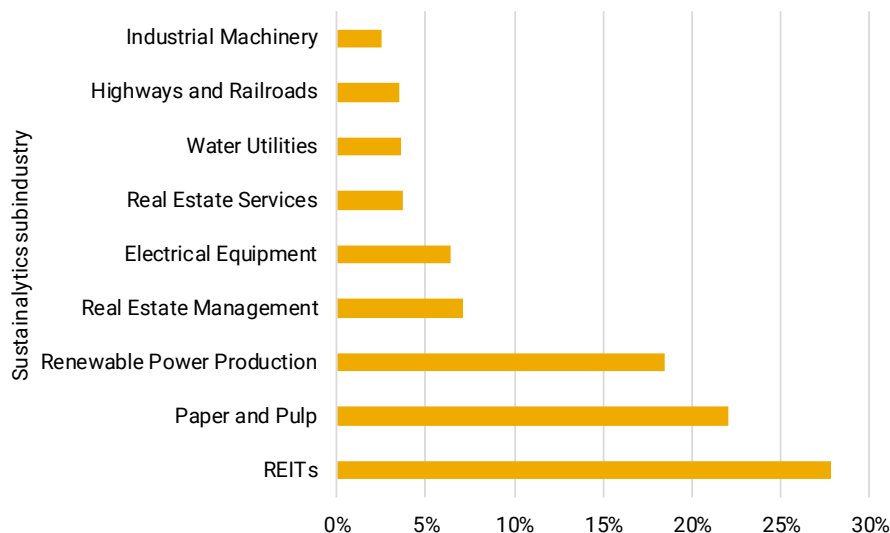
Source: Sustainalytics, Bloomberg Financial, L.P., Vanguard

Variations

Opportunities for innovation

The thematic investing approach that we conceived for this paper is illustrative and could be built upon in many ways. For instance, investors could consider restricting the strategy to specific impact themes, such as health or green buildings. The security selection process could also be refined by imposing more aggressive (or relaxed) ESG risk hurdles. And as mentioned above, investors could also set industry caps to ensure sector neutrality against the benchmark. Another option would be to incorporate financial ratios, such as return on assets, or market ratios, such as the price to earnings ratios, in the selection process, similar to the smart beta ESG strategy discussed above.

Conclusion – achieving impact with low ESG risk

The potential of an integrated impact strategy

Marrying the ESG Risk Ratings with Sustainalytics' recently launched Sustainable Products Research could provide investors with exposure to low ESG firms that are well-positioned to benefit, from a revenue perspective, as demand escalates for products and services that deliver positive impact. It is essentially an integrated impact strategy. While the sample portfolio's large active return and Sharpe ratio of 0.71 compared to the FTSE All-World index should be interpreted with caution, we believe the results showcase the potential of combining these research streams in portfolio construction.

Engagement and voting

Identifying engagement targets

ESG issues such as climate change are key engagement topics

Corporate engagement and voting have long been considered important components of an overarching RI strategy. While governance issues often dominate investors' engagement agendas, environmental and social issues, notably climate change, have moved up the priority list in recent years.[85]

The goals and motivations of engagement and voting are as varied as the investors that are engaging on ESG issues. Some investors see engagement and voting primarily as a tool to influence the behaviour of portfolio companies, with a view to improving their social and environmental performance. Others emphasize the long-term financial value creation that can accrue from active ownership. In many cases, these motivations are intertwined.[86]

The MEI structure of the ESG Risk Ratings maps to engagement themes

Sustainalytics believes that the ESG Risk Ratings could be used to inform investors' engagement and voting practices in several ways. From a top-down perspective, the MEI structure of the ratings can be used to unpack broad engagement themes. For example, Figure 27 shows the MEIs that fall under four common engagement themes: risk management, climate change, human rights, and conduct and culture.[87] Investors can explore the various components of these MEIs and feed the findings into their engagement topic selection process.

Figure 27: Mapping MEIs to common engagement themes

Source: Sustainalytics
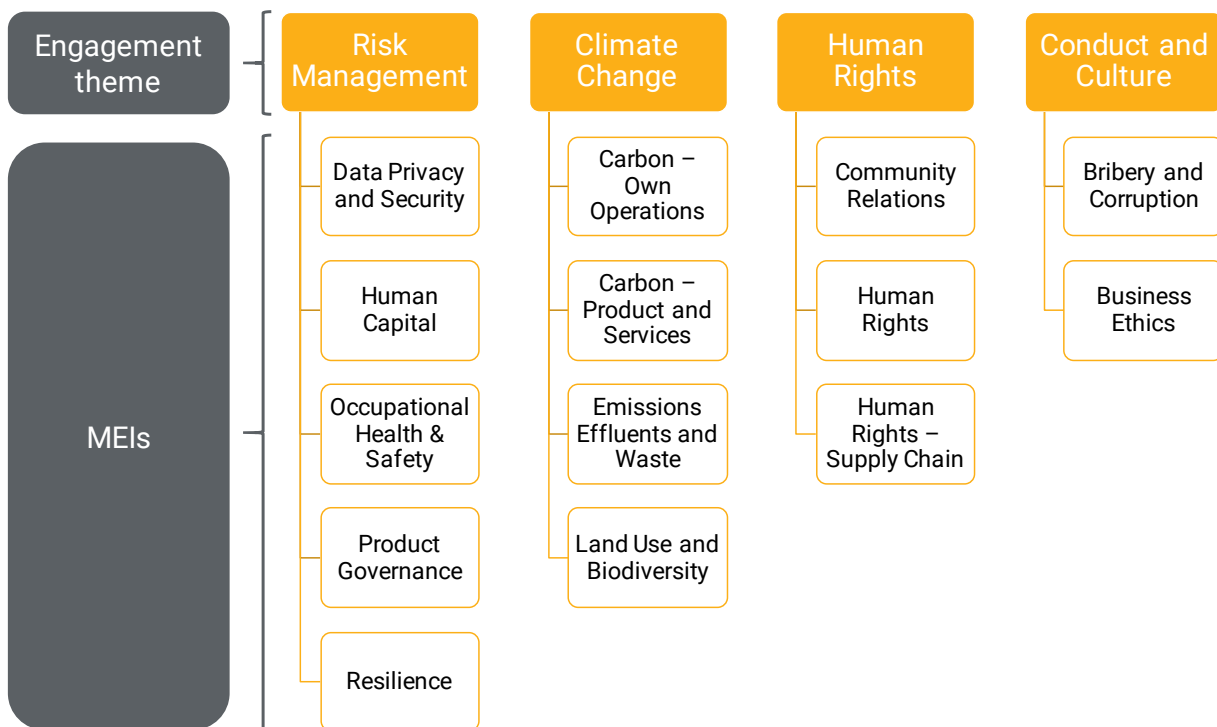
Pinpointing engagement targets

Carbon emissions from company operations face tightening regulations

The ESG Risk Ratings could also be used to identify engagement targets. In the discussion below, we use the Carbon – Own Operations MEI to show how such a selection process could unfold in practice. We use this MEI as a case study because corporate strategizing around climate change, including risk identification, reporting and emissions measurement, has become a dominant engagement topic in recent years.[88]
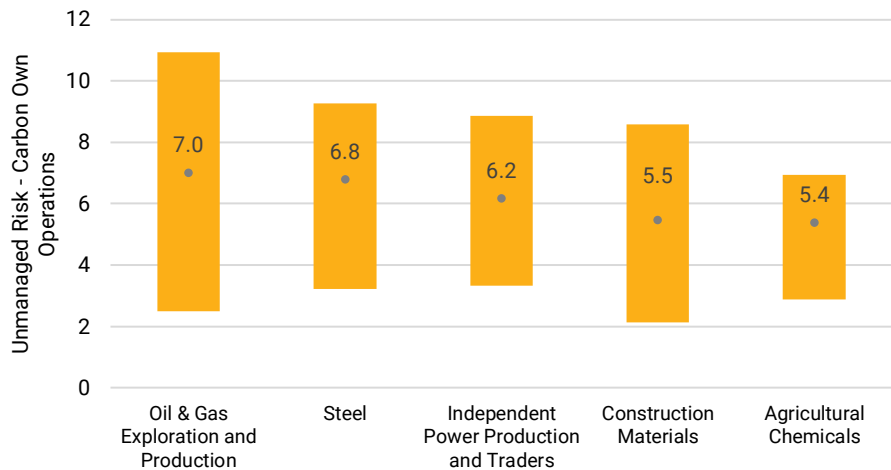
Carbon – Own Operations MEI at the subindustry level

Some subindustries face higher risks than others

Of the 138 subindustries represented in the ESG Risk Ratings, 79 (57%) are exposed to the Carbon – Own Operations MEI, which is to say that the issue is a material concern for the 2,418 companies in these 79 subindustries. However, the precise exposure of these companies is far from uniform, and the ESG Risk Ratings contain numerous quantitative metrics that can be used to further differentiate companies and subindustries based on their level of exposure.

One approach is to target subindustries that have a relatively high average unmanaged risk score on the Carbon – Own Operations MEI. Figure 28 shows the five subindustries that float to the top in this analysis.[89] These subindustries constitute a reasonable starting universe for investors looking to engage on carbon issues within company operations.

Figure 28: Targeting subindustries in the Carbon – Own Operations MEI

Source: Sustainalytics

Some investors may prefer targeting subindustries with a performance gap

The grey dots in Figure 28 show each subindustry's average unmanaged risk score on the Carbon – Own Operations MEI, while the height of the gold bar captures the variation in company-specific scores. Thus, while the typical Oil & Gas Exploration and Production company has an unmanaged risk score of 7.0, the values range from a high of 10.9 (Panoro Energy ASA) to a low of 2.5 (DNO ASA). Some investors may prefer targeting subindustries that have a wide range of unmanaged risk scores as they may contain a deeper contrast in management practices.

Narrowing the signal

Selecting engagement targets using the management gap

Carrying on from the analysis above, the ESG Risk Ratings could be used to identify company-specific engagement targets in a transparent and rules-based manner. The approach that we sketch below is based on the management gap, which is the difference between a company's manageable risk and managed risk.[90] The management gap unmasks those companies that have the highest (manageable) exposure to, and the worst management of, a given MEI. This technique targets companies that a) have high risk exposure; b) can mitigate risks through relevant policies and programmes; and c) have not, for whatever reason, implemented such policies or programmes, as reflected in management and events indicators.

Company level

A refined list of engagement targets

Figure 29 shows the five companies from the five at-risk subindustries (Oil & Gas Exploration and Production, Steel, Independent Power Production and Traders, Construction Materials and Agricultural Chemicals) with the highest management gap score on the Carbon – Own Operations MEI. These firms constitute a refined basket of engagement targets for investors looking to engage on carbon issues.

Figure 29: Targeting companies on the Carbon – Own Operations MEI

Engagement target	Country	Subindustry	Management Gap, Carbon - Own Operations	Unmanaged Risk, Carbon - Own Operations	Unmanaged Risk Category, Carbon - Own Operations
Panoro Energy ASA	Norway	Oil & Gas Exploration and Production	10.3	10.9	Severe
Parsley Energy Inc	United States	Oil & Gas Exploration and Production	10.0	10.6	Severe
Extraction Oil & Gas Inc	United States	Oil & Gas Exploration and Production	9.8	10.4	Severe
Diamondback Energy Inc	United States	Oil & Gas Exploration and Production	9.6	10.2	Severe
Africa Oil Corp	Canada	Oil & Gas Exploration and Production	9.1	9.7	Severe

Source: Sustainalytics

Enhancing the engagement process

Using the ESG Risk Ratings could improve the engagement process itself

In addition to helping investors identify engagement targets, the ESG Risk Ratings could enhance the engagement process itself, for example through the pieces of data and informed judgement the rating is built upon, including indicator-level information. Our 2016 report on engagement offers an instructive backdrop to the different ways that investors sometimes develop their engagement practices.[91]

Conclusion – harnessing ESG scores in engagement

Many different possibilities to use the ESG Risk Ratings in engagement

The ESG Risk Ratings could contribute to investors' engagement and voting strategies in myriad ways. The MEI-based structure of the ratings lines up with the thematic nature of engagement, and quantitative metrics, including unmanaged risk and the management gap, could potentially help investors identify potential engagement targets in a transparent and rules-based manner.

Conclusion

Summarizing results, looking ahead

Creating value for Sustainalytics' clients

In this paper we have sought to aid Sustainalytics' clients by reviewing seven potential use cases of the ESG Risk Ratings: industry tilts, WACC adjustments, smart beta ESG, BIC strategies, screening techniques, thematic investing and corporate engagement. For five of these use cases, we developed sample portfolios to explore the investment value proposition of the ratings. While the results of any financial backtest are subject to inherent limitations and require careful interpretation, we believe the portfolio results presented throughout this study underscore the potential of the ESG Risk Ratings to create incremental investment value for Sustainalytics' clients. The portfolio results offered in this report are summarized in Figure 30.

Figure 30: Overview of portfolio results

Chapter	Sample portfolio	ESG Risk Rating score	Total return	Active return	Standard deviation	Sharpe ratio	Alpha % p.a.
Industry tilts	Conservative tilt	23.3	29.2%	2.0%	15.9	0.48	-
Industry tilts	Moderate tilt	23.1	29.5%	2.3%	16.1	0.49	-
Industry tilts	Aggressive tilt	22.8	30.4%	3.2%	16.3	0.50	-
Smart beta ESG	Smart beta ESG FTSE 100	-	24.5%	3.4%	13.4	0.36	-
Smart beta ESG	Fundamental	-	24.2%	3.1%	13.5	0.35	-
Smart beta ESG	ESG	-	25.1%	4.1%	13.3	0.36	-
BIC strategies	Carbon - Own Operations, APAC, BIC-MOM	-	-	-	-	-	11.8
BIC strategies	E&S Impact of Products and Services, APAC, BIC-MOM	-	-	-	-	-	10.6
BIC strategies	Emissions, Effluents & Waste, APAC, BIC-MOM	-	-	-	-	-	9.8
BIC strategies	E&S Impact of Products and Services, Europe, BIC-MOM	-	-	-	-	-	8.8
BIC strategies	Human Capital, Europe, BIC-MOM	-	-	-	-	-	7.4
BIC strategies	Carbon - Own Operations, Europe, BIC	-	-	-	-	-	7.3
BIC strategies	Human Capital, North America, BIC-MOM	-	-	-	-	-	3.8
BIC strategies	Carbon - Own Operations, North America, BIC-MOM	-	-	-	-	-	2.8
BIC strategies	Human Capital, North America, BIC	-	-	-	-	-	2.3
Screening techniques	Unmanageable risk screened	22.9	32.9%	5.7%	16.6	0.54	-
Thematic investing	Sustainable products low ESG risk	-	53.9%	26.6%	19.6	0.71	-

Source: Sustainalytics, Bloomberg Financial, L.P., Vanguard[92]

Future direction

A much longer journey

While this paper concludes the ESG Risk Ratings white paper series, in many ways it marks the beginning of a much longer journey centred on quantitative testing of Sustainalytics' ratings and data products. We look forward to continuing our quantitative investigations and working with Sustainalytics' clients to identify further applications of the ESG Risk Ratings. Top of mind research questions include:

- testing sample portfolios based on Sustainalytics' data over longer holding periods;
- updating the correlation coefficient between WACC values and ESG Risk Rating scores;
- investigating the use of an optimizer in setting WACC adjustment factors;

- unpacking regional BIC strategies into country-specific BIC strategies;
- combining the ESG Risk Ratings with recognized risk premia such as volatility, momentum and quality in a smart beta ESG strategy;
- exploring long/short strategies, building off the foundation from Volume 1 in the ESG Risk Ratings white paper series; and
- marrying the ESG Risk Ratings with other Sustainalytics' products in portfolio construction (e.g. Sustainalytics' country risk research in a multi-asset portfolio).

We look forward to exploring these and other research questions in future publications.

Endnotes

[1] The authors wish to thank their Sustainalytics colleagues Clark Barr, Ita Demyttenaere, Palla Ellemann, Roxana Dobre, Alison Gray, Cheryl Gustitus, Michael Jantzi, Francesco Mazzeo, Shazia Naik, Hanna Roberts, Diederik Timmer, Victor Ursulescu, Martin Vezér, Claudia Volk and Megan Wallingford for their assistance in preparing this report. We would like to extend a special note of thanks to our colleague Dr. Hendrik Garz for his continued guidance and support throughout the writing of this report.

[2] Garz, H. and Volk, C. (2018), The ESG Risk Ratings, Moving up the Innovation Curve, White Paper – Volume 1, Sustainalytics, accessed (02.04.2019) at: https://marketing.sustainalytics.com/acton/attachment/5105/f-0b6c/1/-/-/-/-/SustainalyticsESGRiskRatings_WhitePaperVolumeOne_October%202018.pdf

[3] Morrow, D., Syed, M. and Burress, S. (2018), The ESG Risk Ratings, Exploring the Internet Software and Services subindustry, White Paper – Volume 2, Sustainalytics, accessed (02.04.2019) at: https://marketing.sustainalytics.com/acton/attachment/5105/f-0ba7/1/-/-/-/-/SustainalyticsESGRiskRating_WhitePaperVolumeTwo.pdf

[4] To be considered material in the ESG Risk Ratings, an ESG issue must have the potential to have a significant impact on the financial value of a company and, hence, the financial risk and return profile of an investment in the company. It is important to distinguish the ESG Risk Ratings' use of materiality as a concept from narrower legal or accounting-focused definitions. More formally, an ESG issue is considered material within the ESG Risk Ratings' framework if its presence or absence in financial reporting is likely to influence the decisions made by a reasonable investor. For more information, see Volume 1 in the ESG Risk Ratings white paper series.

[5] Some risks are manageable, like the risk of on-the-job injuries, which can be managed through establishing stringent safety procedures, having emergency response plans, safety drills, promoting a safe culture, etc. Some risks, on the other hand, are not fully manageable, such as the carbon emissions of airplanes in flight. For more information, see Volume 1 in the ESG Risk Ratings white paper series.

[6] This is a simplified discussion that leaves several concepts of the ESG Risk Ratings, including beta, unexamined. For a more detailed explanation of the methodology behind the ESG Risk Ratings, see Volume 1 in the ESG Risk Ratings white paper series.

[7] Based on ESG data as of March 6, 2019.

[8] Friede, G., Busch, T. and Bassen, A. (15.12.2015), "ESG and financial performance: aggregated evidence from more than 2000 empirical studies," Journal of Sustainable Finance & Investment, accessed (02.04.2019) at: https://www.tandfonline.com/doi/abs/10.1080/20430795.2015.1118917

[9] As proxied by the Vanguard VWRL ETF, which tracks the FTSE All-World index. Information about VWRL can be found at: https://www.vanguardinvestor.co.uk/investments/vanguard-ftse-all-world-ucits-etf-usd-distributing?intcmpgn=equityglobal_ftseallworlducitsetfusddistributing_fund_link

[10] Industry weights in the benchmark and three tilt scenarios as of January 1, 2018. Benchmark weights accessed from Bloomberg Financial L.P. through the Vanguard ETF VWRL. We adopt the Industry Classification Benchmark (ICB) methodology, which is used by the FTSE All-World index. ESG scores as of March 6, 2019.

[11] We used a simple average of subindustry-specific unmanaged risk scores and mapped the scores from the 138 subindustries in Sustainalytics' industry classification system to the 10 ICB industries.

[12] Index weight approximated through the Vanguard VWRL ETF, sourced from Bloomberg Financial L.P. and as of January 1, 2018.

[13] Equals 0.5% due to rounding.

[14] As of January 1, 2018.

[15] As the revised weights under all 3 scenarios slightly exceeded 100%, we divided the remainder by three and applied it to the three industries with a negative tilt (Utilities, Basic Materials and Oil & Gas) thus further reducing their weight.

[16] After 150%, the amplifiers begin to reduce the portfolio weight of high-risk industries to 0, which is effectively a screening strategy.

17   Constituents taken from the Vanguard VWRL ETF, which tracks the FTSE All-World index.

18   As proxied by the Vanguard VWRL ETF, which tracks the FTSE All-World index.

19   Of the 3,072 companies in the FTSE All-World index as of 1 January 2018, ESG Risk Rating scores were available for 2,926 companies.

20   Based on 2,926 companies from the starting benchmark universe of 3,072 companies (as of 1 January 2018) that are part of the ESG Risk Ratings Coverage universe.

21   Total returns, standard deviation and Sharpe ratio for the FTSE All-World index approximated using the Vanguard VWRL ETF. Total returns, standard deviation and Sharpe ratio calculated using daily returns in USD from January 1, 2014 to December 31, 2018. ESG scores as of March 6, 2019.

22   Bloomberg defines the Sharpe ratio as follows: A risk-adjusted measure that calculates the excess performance with respect to the risk free rate (in our case the yield 3 months linked to the currency), per unit of volatility over the time frame. Performance is measured as mean return. The higher the Sharpe ratio, the better the historical risk-adjusted performance.

23   Hargrave, M. (10.02.2019), "Weighted average cost of capital – WACC definition," Investopedia, accessed (02.04.2019) at: https://www.investopedia.com/terms/w/wacc.asp

24   See our discussion about pricing in Volume 1 of the ESG Risk Ratings white paper series, available at: https://marketing.sustainalytics.com/acton/attachment/5105/f-0b6c/1/-/-/-/-/SustainalyticsESGRiskRatings_WhitePaperVolumeOne_October%202018.pdf

25   WACC values were taken from Bloomberg Financial, L.P. on 15 November 2018. WACC values represent an estimate of a firm's potential costs of funding sources.

26   ESG data as of 6 March 2019. WACC data as of 15 November 2018.

27   We used sectors to improve statistical significance. The 138 subindustries in Sustainalytics' industry classification system currently map to six sectors: Consumer Goods, Extractives and Utilities, Financials, Healthcare and Chemicals, Industrials & Infrastructure and Technology, Media and Telecom.

28   ESG data as of 6 March 2019. WACC data as of 15 November 2018.

29   FCF data were taken from Bloomberg Financial, L.P. on 3 March 2019. FCF data refer to Bloomberg Financial, L.P. consensus forecasts for the 12 months ending 31 December 2020.

30   WACC values are estimates compiled by Bloomberg Financial, L.P. and were taken on 15 November 2018. FCF data were taken from Bloomberg Financial, L.P. on 3 March 2019. FCF data refer to Bloomberg Financial, L.P. consensus forecasts for the 12 months ending 31 December 2020. ESG data as of March 6, 2019.

31   Morningstar Direct, accessed (04.02.2018) at: https://www.morningstar.com/products/direct. Morningstar uses the phrase strategic beta instead of smart beta. Strategic beta is slightly more expansive than what is typically referred to as "smart beta".

32   Morrow, D., Rodrigues, A. and Mooij, S. (2017), Smart beta and ESG: Promoting sustainability in smart beta investment strategies, accessed (04.02.2019) at: https://www.sustainalytics.com/esg-research/thematic-reports/smart-beta-esg/

33   The FTSE 100 is a market cap-weighted index of UK-listed blue chip companies. For more information, see https://www.ftse.com/Analytics/Factsheets/Home/DownloadSingleIssue?issueName=UKX&IsManual=False. We selected this index instead of the FTSE All-World due to the smaller number of constituents and data requirements in our simplified smart beta ESG model.

34   Constituents taken from the Vanguard VUKE ETF, which tracks the FTSE 100 index. For more information about the VUKE ETF, see https://americas.vanguard.com/institutional/mvc/detail/etf/overview?portId=9509&assetCode=EQUITY##overview

[35] This screen resulted in the removal of 9 constituents representing 6.8% of the index in 2014, 6 constituents representing 8.6% of the index in 2015, 2 constituents representing 3.9% of the index in 2016, 2 constituents representing 0.8% of the index in 2017 and 3 constituents representing 1.1% of the index in 2018.

[36] While the ESG Risk Ratings are computed at the subindustry level, we used the broader sector grouping to increase sample size. The six sectors are: Consumer Goods, Extractives and Utilities, Financials, Healthcare and Chemicals, Industrials & Infrastructure, Technology, Media and Telecom.

[37] ESG Risk Rating scores as of March 6, 2019. They were held constant during the investment period, i.e. we did not use historical ESG scores.

[38] Inverse ranks were necessary because we sought to assign more "points" to superior performers, and in the ESG Risk Ratings model, lower scores are superior, i.e. they indicate lower levels of unmanaged risk.

[39] Dividend yield data sourced from Bloomberg Financial L.P. on March 19, 2019. Dividend yield defined as the sum of gross dividend per share amounts that have gone ex-dividend over the prior 12 months, divided by the current stock price.

[40] Companies for which dividend yield data was unavailable were assigned their sector average.

[41] Return on assets data sourced from Bloomberg Financial L.P. on March 19, 2019. Return on assets gives an idea as to how efficient management is at using its assets to generate earnings. It is defined as (Trailing 12M Net Income / Average Total Assets) * 100.

[42] Companies for which return on assets data was unavailable were assigned their sector average.

[43] These include: price to earnings ratio, and return on equity.

[44] As approximated by the Vanguard VUKE ETF.

[45] Index weights approximated by the Vanguard VUKE ETF. Portfolio and index weights are average weights calculated over the 5 year investment period (i.e. 2014 – 2018).

[46] Portfolio and index returns computed on Bloomberg Financial L.P. Portfolio and benchmark returns calculated using daily returns in GBP.

[47] Calculated using daily returns in GBP.

[48] Attribution analysis conducted using Bloomberg Financial L.P.'s attribution model.

[49] Morrow, Rodrigues and Mooij (2017), op. cit.

[50] Sustainalytics Controversies Research, corporate website, last accessed (04.02.2019) at: http://www.sustainalytics.com/controversies-research/.

[51] In some ways smart beta sits in a sweet spot between active and passive. For more information, see Morrow, Rodrigues and Mooij (2017), op. cit.

[52] Vezér, M., David, T., Ranney, K. and Morrow, D. (2017), How investors integrate ESG: A typology of approaches, IRRC Institute and Sustainalytics, accessed (04.02.2019) at: https://www.sustainalytics.com/esg-research/thematic-reports/how-investors-integrate-esg-typology-irrci/

[53] Friede, Busch and Bassen (2015), op. cit.

[54] The BIC analysis presented in this report is a sample of a much larger empirical discussion from Volume 1. Concepts not covered here but touched on in Volume 1 include using the ESG Risk Ratings in a long/short strategy, alternative portfolio weightings, and MEI-specific alphas.

[55]   From a starting universe of 20 MEIs, these were the 8 that met our data availability requirements.

[56]   The fact that the ESG Risk Ratings were developed as a completely new approach/methodology, a true innovation, made it unavoidable that we would face some data constraints in back-testing. For example, new indicators were introduced to assure that we were able to measure how well a company is able to manage its financially material ESG issues. Obviously, there was no track record for these new indicators. Similarly, the second dimension of the rating, the exposure dimension, was also newly developed and introduced with the ESG Risk Ratings, which meant an absence of historical data points. We dealt with this situation by (1) backfilling historical data gaps as feasible, and (2) making simplifying assumptions or reducing completeness requirements. We are planning to continue our back-testing efforts and will present further results in lockstep with the progress we make in backfilling further data gaps.

[57]   For the momentum strategies, the portfolio performance analysis started in January 2011, instead of January 2010, reflecting the need to calculate an annual change number as a prerequisite for portfolio formation. This reduces the portfolio return observation period to 90 months (from 102 months).

[58]   See Carhart, M. M. (1997), On Persistence in Mutual Fund Performance, The Journal of Finance, Vol. 52, pp. 57–82.

[59]   In technical terms, the Carhart α is nothing else than the intercept (α) of the following four factor regression:

$$R_t - Rf_t = \alpha + \beta_1 * RMRF_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * UMD_t + \varepsilon_t$$

R_t is the monthly return of an investment strategy portfolio and Rf_t is the risk-free rate in month t. RMRF is the difference between market return and the risk-free rate, SMB is the difference in return between a small-cap portfolio and a large-cap portfolio, HML is the difference in return between a portfolio of high book-to-market stocks and one of low book-to-market equities and UMD is the difference in return between equities with upward and downward share price momentum. We used monthly factor return data from Kenneth French's data library (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

[60]   Average alpha by region across all 48 strategies are 6.8 for APAC, 5.8 for Europe and 1.3 for North America.

[61]   Global Sustainable Investment Alliance, The 2016 Global Sustainable Investment Review (2017), accessed (02.04.2019) at: http://www.gsi-alliance.org/wp-content/uploads/2017/03/GSIR_Review2016.F.pdf

[62]   Vezér, David, Ranney and Morrow (2017), op. cit.

[63]   Grantham, J. (13.06.2018), "The mythical peril of divesting from fossil fuels," The London School of Economics and Political Science and the Grantham Research Institute on Climate Change and the Environment, accessed (02.04.2019) at: http://www.lse.ac.uk/GranthamInstitute/news/the-mythical-peril-of-divesting-from-fossil-fuels/

[64]   Trinks, A., Scholtens, B., Mulder, M. and Dam, L. (04.04.2018), "Fossil fuel divestment and portfolio performance," Ecological Economics, accessed (02.04.2019) at: https://www.sciencedirect.com/science/article/pii/S0921800917310303

[65]   The full definition is as follows: Material ESG Risk inherent from the intrinsic nature of the products or services of a company and/or the nature of a company's business, which cannot be managed by the company if the company continues to offer the same type of products or services and remains in the same line of business. For example, a coal company cannot fully manage the carbon emission risks of coal without exiting the coal business, as coal will continue to emit carbon when burned, regardless of a company's management initiatives. The only option to fully manage this risk would be to diversify out of the coal business. This risk cannot be meaningfully modelled by assessment of management indicators and is therefore regarded as unmanageable.

[66]   It is calculated as the sum of each MEI's exposure multiplied by that MEI's manageable risk factor. MRFs essentially seek to answer the following question, "How much of the risk associated with a given ESG issue can a company reasonably manage, given its current business model and the current business environment?". MRFs are set at the subindustry level and are MEI-specific. The higher the MRF, the greater the amount of ESG risk companies in a given subindustry can manage on a given MEI. See Volume 1 for a more complete discussion.

[67]   Based on ESG data as of March 6, 2019.

[68]   Constituents taken from the Vanguard VWRL ETF, which tracks the FTSE All-World index.

69   As approximated using the Vanguard VWRL ETF, which tracks the FTSE All-World index. Sourced from Bloomberg Financial L.P.

70   Total returns, standard deviation and Sharpe ratio for the FTSE All-World index approximated using the Vanguard VWRL ETF. Total returns, standard deviation and Sharpe ratio calculated using daily returns in USD from January 1, 2014 to December 31, 2018. ESG scores as of March 6, 2019.

71   As approximated using the Vanguard VWRL ETF, which tracks the FTSE All-World index. Sourced from Bloomberg Financial L.P.

72   Macrotrends (2019), Crude oil prices – 70 year historical chart, Macrotrends, accessed (02.04.2019) at: https://www.macrotrends.net/1369/crude-oil-price-history-chart Prices refer to West Texas Intermediate.

73   The sample portfolio had a 0.8% allocation to Oil & Gas companies, as some Oil & Gas-related subindustries, such as Oil & Gas Drilling and Oil & Gas Equipment, were not screened.

74   Calculated using daily returns in USD. Index returns approximated using the Vanguard VWRL ETF, which tracks the FTSE All-World index.

75   The FTSE All-World index proxied by the Vanguard VWRL ETF, which tracks the FTSE All-World index, in attribution analysis.

76   Chestney, N. and Doyle, A. (05.04.2018), "Solar power eclipsed fossil fuels in new 2017 generating capacity: U.N.," Reuters, accessed (02.04.2019) at: https://www.reuters.com/article/us-renewables-investment/solar-power-eclipsed-fossil-fuels-in-new-2017-generating-capacity-u-n-idUSKCN1HC1NC

77   The maximum revenue category in Sustainalytics' Sustainable Products Research is 50-100%. For more information, see https://www.sustainalytics.com/sustainable-products-research/

78   The FTSE All-World index tracks the performance of mid and large cap stocks. Market cap data sourced from Bloomberg as of March 27, 2019.

79   We show only 15 firms (3 each for 5 themes) for the sake of simplicity. In total, 249 firms covering 11 themes passed the first stage of the security selection process.

80   Market cap data sourced from Bloomberg as of March 27, 2019.

81   Index returns proxied using the Vanguard VWRL ETF, which tracks the FTSE All-World index.

82   Calculated using daily returns in USD.

83   As approximated using the Vanguard VWRL ETF, which tracks the FTSE All-World index. Based on average weights over all 5 portfolio years.

84   The REITs subindustry has an average ESG Risk Rating score of 18.7, which is the 28th lowest out of the 138 subindustries in Sustainalytics' classification system.

85   Institutional Investors Group on Climate Change (IIGCC) (2019), Corporate engagement, accessed (02.04.2019) at: http://www.iigcc.org/publications/category/Corporate-Climate-Risk-Management

86   Dimson, E., Karakas, O. and Li. X. (17.12.2012), "Active ownership," Review of Financial Studies, accessed (02.04.2019) at: http://www.people.hbs.edu/kramanna/HBS_JAE_Conference/Dimson_Karakas_Li.pdf

87   Hermes (2018), Public engagement report Q3 2018, Hermes, accessed (20.02.2019) at: https://www.hermes-investment.com/ukw/wp-content/uploads/sites/80/2018/10/public-engagement-report-q3-2018.pdf

88   Hermes (2018), op. cit.

[89]   We excluded Airlines and Shipping as they have a relatively high amount of unmanageable risk on the Carbon – Own Operations MEI (60% and 40% respectively).

[90]   The management gap score is the difference between manageable risk and managed risk. It is the amount of risk that a company *could manage* but does not have initiatives in place yet to manage. For more details, see Volume 1 of the ESG Risk Ratings white paper series, available at: https://marketing.sustainalytics.com/acton/attachment/5105/f-0b6c/1/-/-/-/-/SustainalyticsESGRiskRatings_WhitePaperVolumeOne_October%202018.pdf

[91]   O'Sullivan, N. and Gond, J.P. (2016), Engagement: Unlocking the black box of value creation, Sustainalytics and Cass Business School, University of London, accessed (20.02.2019) at: https://marketing.sustainalytics.com/acton/attachment/5105/f-08d0/1/-/-/-/-/Thematic%20Research%202016%2006%20Engagement%20Unlocking%20the%20black%20box%20of%20value%20creation.pdf

[92]   Total returns calculated using daily returns during a holding period from 1 January 2014 to 31 December 2018. The benchmark for the sample portfolios in the industry tilts, screening techniques and thematic investing chapters was the Vanguard VWRL ETF, which tracks the FTSE All-World index. The benchmark for the sample portfolios in the smart beta ESG chapter was the FTSE 100 index. For the BIC strategies chapter, only the top three sample portfolios per region are shown (i.e. those from Figure 17). Alpha % p.a. calculated using the Carhart model. See the BIC strategies chapter for further details.