

PORTFOLIO
MANAGEMENT
RESEARCH

the journal of PORTFOLIO *management*

volume 47
number 3

FEBRUARY
2021

jpm.pm-research.com



Deconstructing ESG Ratings
Performance: Risk and Return for E, S,
and G by Time Horizon, Sector, and Weighting

Guido Giese, Zoltán Nagy, and Linda-Eling Lee





Guido Giese

Executive Director, Core Equity Research

Guido Giese is an Executive Director in MSCI's Core Equity Research team, where he is responsible for applied research and thought leadership in key areas such as ESG integration, impact investing, and factor investing.

Prior to joining MSCI, Guido was responsible for the sustainability index solutions business at RobecoSAM, following his tenure as Head of Research and Development at index provider STOXX Ltd, where he was responsible for developing new index solutions. He has more than 20 years' experience in research and product development in the asset management industry.

Guido holds a PhD in Applied Mathematics from the Swiss Federal Institute of Technology Zurich and has authored numerous articles in international journals for quantitative finance and risk management.



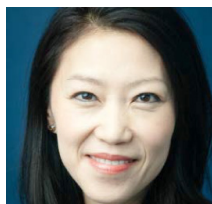
Zoltán Nagy

Executive Director, Core Equity Research

Zoltán Nagy is an executive director in MSCI's Equity Core Research team. In this role, he focuses on questions related to the integration of factors and ESG into the equity portfolio management process. Zoltán joined MSCI in 2008, and first worked on the development of new index methodologies and on other index-related research.

Prior to entering finance, he was a post-doctoral researcher at the University of Algarve, Faro, Portugal. His area of research was quantum integrable systems.

Zoltán holds a PhD degree in Theoretical Physics from the University of Cergy-Pontoise, France, and an engineering degree from the Ecole Polytechnique, France. He is also a CFA® charterholder.



Linda-Eling Lee

Managing Director and Global Head of ESG Research

As Global Head of Research for MSCI's ESG Research group, Linda-Eling Lee oversees all ESG-related content and methodology. MSCI ESG Research is the largest provider of ESG Ratings and analytics to global institutional investors. Linda leads one of the largest teams of research analysts in the world who are dedicated to identifying risks and opportunities arising from significant ESG issues.

Linda joined MSCI in 2010 following the acquisition of RiskMetrics, where she led ESG ratings research and was head of consumer sector analysis. Linda joined RiskMetrics Group in 2009 through the acquisition of Innovest. Prior to joining Innovest, Linda was the Research Director at the Center for Research on Corporate Performance, developing academic research at Harvard Business School into management tools to drive long-term corporate performance. Previously, she was a strategy consultant with Monitor Group in Europe and in Asia.

Linda received her AB from Harvard, MSt from Oxford, and PhD in Organizational Behavior from Harvard University.

She has published research both in management journals such as the Harvard Business Review and MIT's Sloan Management Review, as well as in top academic peer-reviewed journals.

Deconstructing ESG Ratings Performance: Risk and Return for E, S, and G by Time Horizon, Sector, and Weighting

Guido Giese, Zoltán Nagy, and Linda-Eling Lee

Guido Giese

is an executive director of Equity Core Research at MSCI in London, UK.
guido.giese@msci.com

Zoltán Nagy

is an executive director of Equity Core Research at MSCI in Budapest, Hungary.
zoltan.nagy@msci.com

Linda-Eling Lee

is a managing director and the global head of ESG Research at MSCI in New York, NY.
lindaeling.lee@msci.com

KEY FINDINGS

- Aggregating environmental, social, and governance pillars into a total ESG rating added value in terms of performance and risk.
- Governance indicators showed the greatest significance in the short term because they have tended to materialize as event risks that immediately affected stock prices.
- However, some E and S indicators have developed slowly but have had long-lasting financial effects (erosion risks).

ABSTRACT

There are many ways to construct a company's environmental, social, and governance (ESG) score or rating, involving different combinations of financial and nonfinancial inputs. Determining the most influential criteria for firm performance may be overlooked in the rush to "do some ESG." In this study, the authors deconstruct ESG ratings performance at the E, S, and G pillar levels and use the most common key issues indicators that underlie ESG scores. They find that the time horizon used has an important bearing on the indicators' significance. In the short term, they find that governance is the dominant pillar because it strongly reflects event risks, such as fraud. In the long term, however, environmental and social indicators became more important because issues such as carbon emissions tended to be more cumulative, presenting erosion risks to long-term performance. The authors also find that a more balanced and industry-specific weighting of E, S, and G issues showed better long-term relevance than the individual pillar indicators alone.

TOPICS

Equity portfolio management, ESG investing, pension funds, foundations & endowments, performance measurement, wealth management, risk management*

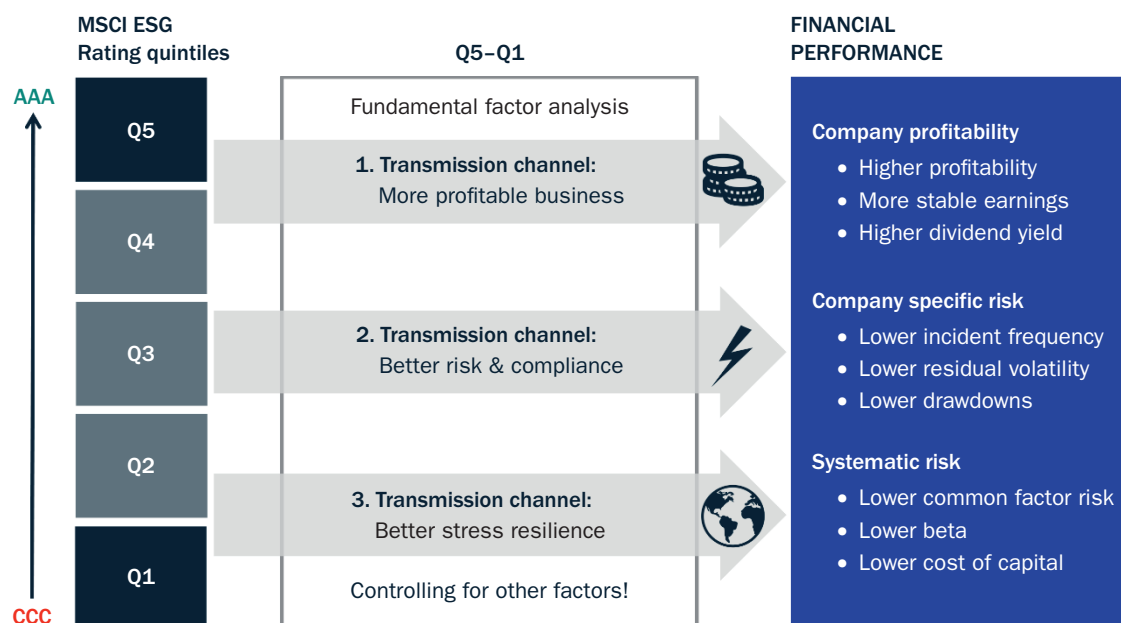
As investing with environmental, social, and governance (ESG) principles continues to gain momentum, more investors have begun employing third-party ESG ratings or scores in the construction of their own propriety models.¹ There are many ways to construct a company ESG score, involving different combinations of

*All articles are now categorized by topics and subtopics. [View at PM-Research.com](#).

¹ ESG scores are used in creating ESG ratings and thus are more granular, as we discuss later.

EXHIBIT 1

Economic Transmission Channels to Be Tested



SOURCE: MSCI ESG Research LLC.

financial and nonfinancial inputs. Determining the most influential criteria that reflect firm performance may be overlooked in the rush to “do some ESG.”

Understanding the relative significance of the different ESG issues that underlie an ESG rating is important for advancing the theoretical underpinnings of how ESG captures hard-to-observe firm characteristics that may affect financial performance. It is also critical for the advanced integration of ESG factors into stock selection and portfolio construction.

This study builds on previous research in which we identified three economic transmission channels—the cash flow, idiosyncratic risk, and valuation channels—through which ESG information was conveyed to affect financial risk and performance (Giese et al. 2019a). Here we used data that are more granular than those in the previous research and analyzed financial risk and return characteristics at two sublevels: (1) the level of individual E, S, and G pillar scores and (2) the most common key issues underpinning the pillar scores in the MSCI ESG rating methodology.

DATA AND METHODOLOGICAL APPROACH

The three economic transmission channels from ESG characteristics to financial risk and performance can be summarized as follows (see the schematic in Exhibit 1):

1. **Cash-flow channel:** Companies with high MSCI ESG ratings on average have historically been more profitable, displayed more stable earnings, and paid higher dividend yields, controlling for other financial factors. The economic rationale suggests that stronger ESG characteristics may have been linked to better business practices, such as attracting more talented employees, achieving better innovation management, creating long-term business plans

and incentive plans for management, and fostering better customer satisfaction (Fatemi, Fooladi, and Tehranian 2015).

2. **Idiosyncratic risk channel:** Companies with high MSCI ESG ratings have historically shown lower financial drawdown frequencies, controlling for size and industry. These results are logical because companies with high MSCI ESG ratings are considered to have been better able to manage and mitigate company-specific risks than lower-ranked sector peers.
3. **Valuation channel:** Companies with high MSCI ESG ratings have historically shown lower levels of systematic risk and lower costs of capital and, thus, higher levels of valuations. For example, we have shown lower levels of volatility for high-rated companies while controlling for other factors. Moreover, some MSCI ESG indexes have shown lower drawdowns than their market-capitalization-weighted parent indexes in crises (Giese et al. 2019b; Lodh 2020). Companies with strong ESG characteristics may have been more resilient when faced with changing market environments, such as fluctuations in financial markets and changes in regulation. Researchers have found that companies with stronger ESG characteristics have experienced less exposure to risks and higher valuation levels.²

Regarding how the top-level E, S, and G scores are built, one can, for instance, construct an approach using only company-disclosed information. Another may employ only news sources. Weighting issues are also important. For example, one approach may equally weight all E, S, and G topics, and another may selectively weight only a handful of topics by industry. These varying methodologies have resulted in low correlations among third-party ESG ratings (Berg, Kölbel, and Rigobon 2019). Hence, relationships between ESG and financial performance are difficult to generalize without a precise understanding of the underlying components and how these components are combined.

In the case of MSCI ESG ratings, key issues are chosen from a library of 37 E, S, and G risk issues, as shown in Exhibit 2. Key issues are selected at the subindustry level based on their financial significance (i.e., how likely it is that the key risk relates to companies' revenues or assets). Each key issue score employs subindustry-specific weights, which can be as low as zero: Only seven to 12 ESG key issues typically are deemed relevant for a given subindustry. The key issue weights are used to aggregate key issues scores into E, S, and G pillar scores and into the final ESG scores.

Significantly, these key issue scores measure companies' exposure to and management of related risks. For instance, the carbon emissions key issue score (discussed later in this article) measures how companies manage their carbon emissions relative to their exposure to potential regulatory risks regarding carbon. This metric is not the same as merely measuring companies' carbon emissions.

We assessed the financial significance of these ESG indicators—the E, S, and G pillar scores and the underlying key issue scores—replicating the analysis by Giese et al. (2019a). The financial variables are grouped into the three transmission channels illustrated in Exhibit 1.

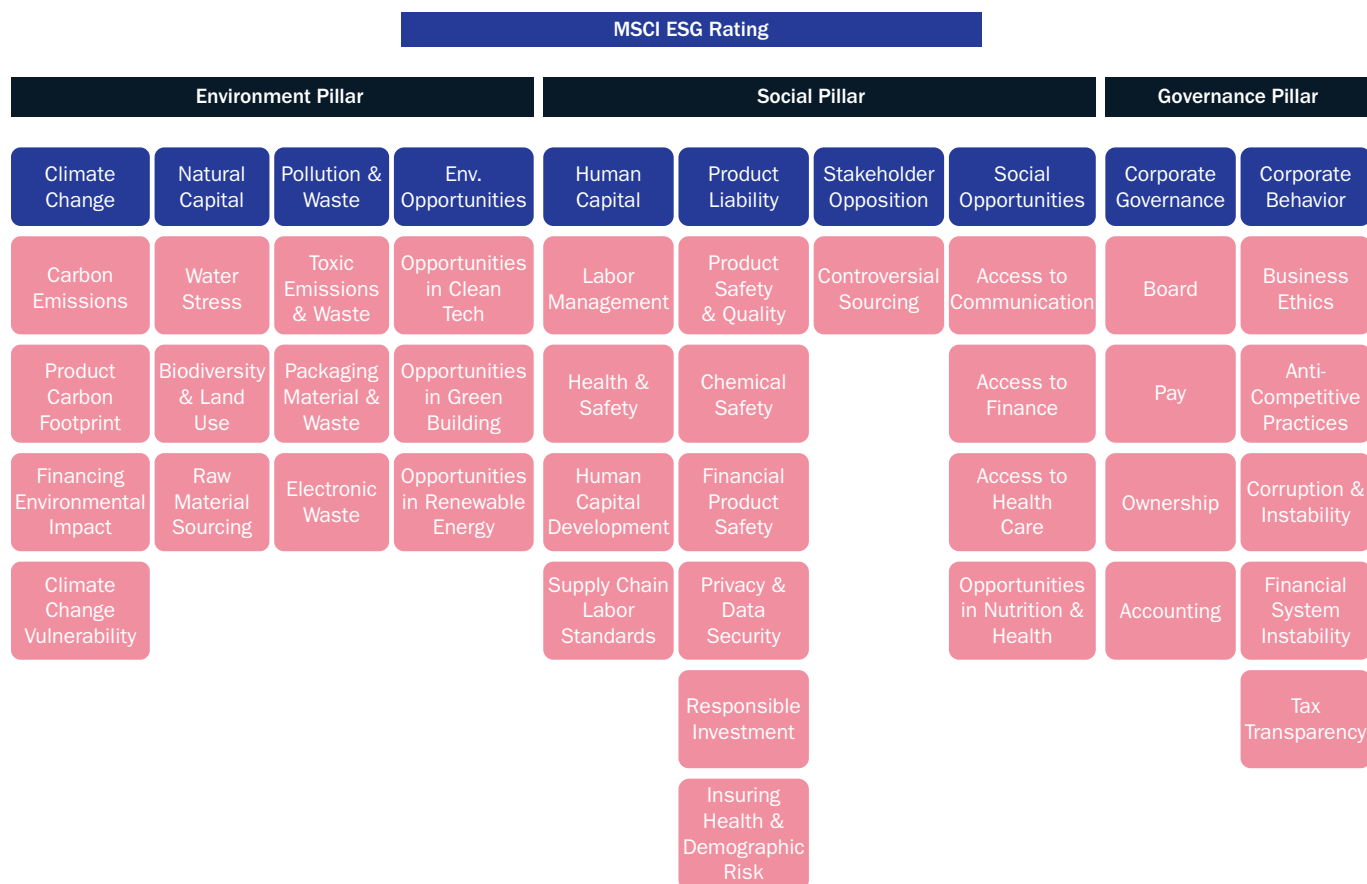
We analyzed the pillar-level transmission channels using MSCI ESG ratings³ for the MSCI World Index from December 2006 to December 2019. The universe contained, on average, over 1,600 large- and mid-cap developed-market stocks. We controlled for size and industry as we did in earlier work (Giese et al. 2019a). For the key issue

² For example, see Eccles, Ioannou, and Serafeim (2014); El Ghoul et al. (2011); Gregory, Tharyan, and Whittaker (2014); and Fatemi, Fooladi, and Tehranian (2015).

³ For more information, see: <https://www.msci.com/esg-investing>.

EXHIBIT 2

MSCI ESG Rating Model and Underlying Key Risk Issues



SOURCE: MSCI ESG Research LLC.

analysis, the available history of scores was shorter, so we used the broader MSCI ACWI IMI universe to increase the statistical significance of the results.

WERE E, S, AND G PILLARS AND KEY ISSUES CORRELATED?

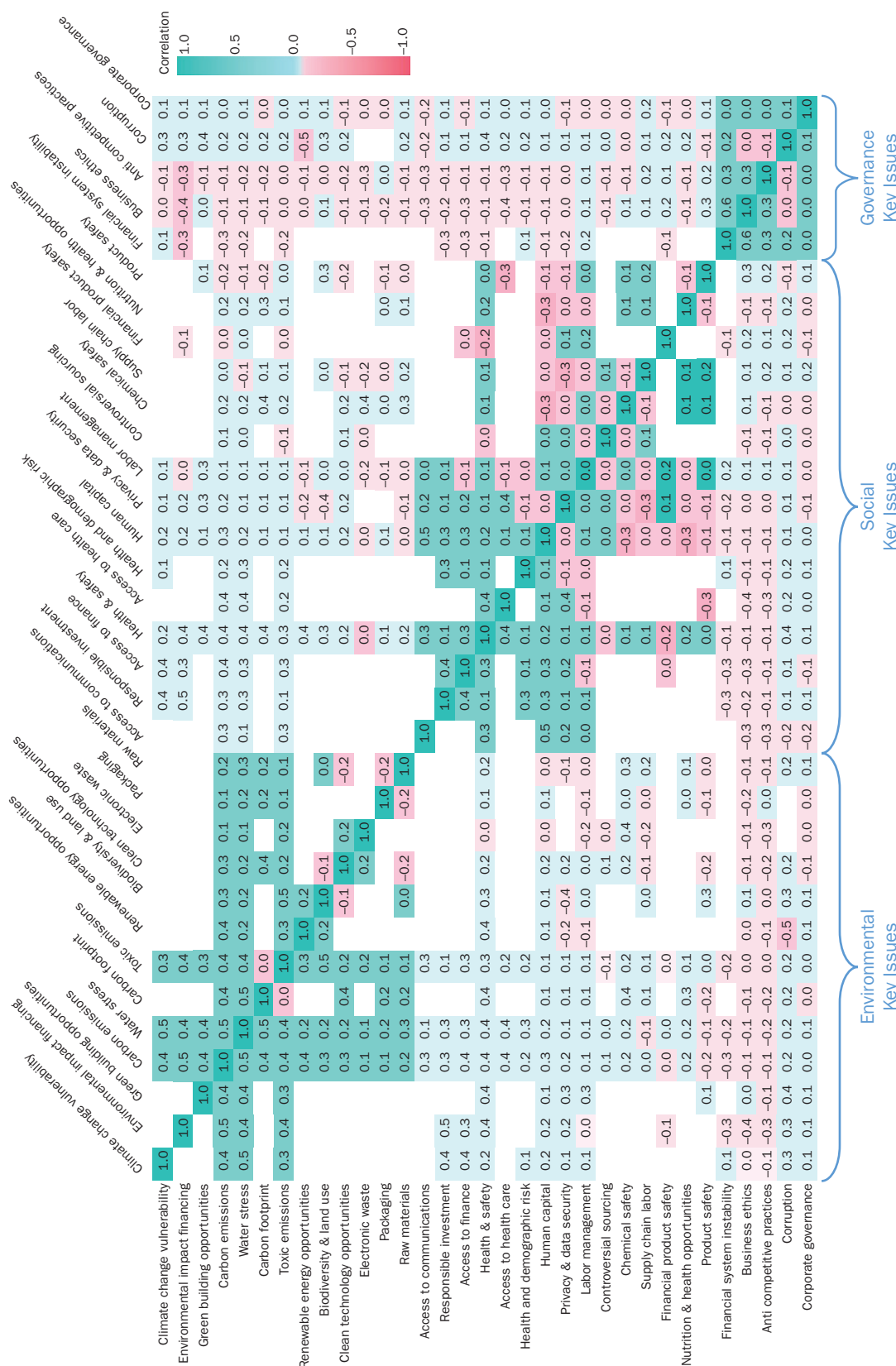
To analyze the financial significance of E, S, and G pillars and key issue scores employed within the MSCI ESG rating model, we first assessed the extent to which the different ESG indicators are independent, as can be seen in the historical correlation matrix of key issue scores (Exhibit 3).

Historically, the key issues used in the rating methodology in general showed a low degree of correlation to each other. We concluded that these scores have largely measured different things. Moreover, companies' exposure to and management of one type of ESG risk has not been correlated to its exposure or management of other types of ESG risks.

The exception occurred within the E pillar, in which carbon emissions, water stress, and toxic emissions showed a positive correlation (the top left portion of the exhibit). The higher correlation of these three indicators is driven by exposure to the utilities, energy, and mining sectors. Their signals overlapped somewhat because thermal power generation, oil extraction, and mining employed water intensively and

EXHIBIT 3

Key Issue Correlation Matrix



NOTES: Data from 2013–2019; covered securities within MSCI ACWI IMI. Owing to the industry-specific relevance of key issues, not all key issues were scored for all companies. We only show pairwise correlations where the common coverage of the two key issues was larger than 20 stocks. We used the larger MSCI ACWI IMI universe to increase statistical significance because the history of key issues is relatively short.

SOURCE: MSCI ESG Research LLC.

EXHIBIT 4**Average Pairwise Key Issue Correlations under E, S, and G Pillars**

	E	S	G
E	0.25	0.13	-0.023
S	0.13	0.059	-0.014
G	-0.023	-0.014	0.14

NOTE: Data from 2013–2019; covered securities within MSCI ACWI IMI.

SOURCE: MSCI ESG Research LLC.

generated high levels of pollution. This correlation may also reflect a tendency for companies in these industries to manage operational risks through a common environmental management system.

Moreover, Exhibit 4 shows the average values of key issue correlations within the three pillars. Average correlations were relatively low, with the highest average level (0.25) found within the E pillar. Average cross-pillar correlations were even lower: Key issues under the E and S pillars had average correlations of 0.13. Hence, we view key issues as approximately independent indicators.

E, S, AND G PILLARS AND FINANCIAL PERFORMANCE

We began our financial analysis using the aggregate MSCI ESG scores and the individual pillar scores and measured the strength of their relationship with

fundamental and risk-related variables representing the three transmission channels (Exhibit 5). This analysis is important in understanding how each of the economic transmission channels performed across the three pillars.

We created five size-adjusted pillar score quintiles (Q1 to Q5), which were rebalanced monthly, with Q1 indicating companies with the lowest pillar score and Q5 companies with the highest pillar score. Fundamental and risk variables, such as book-to-price ratio or beta, are based on MSCI's Barra Global Equity Model for Long-Term Investors (GEMLT) and are therefore in the format of z-scores.⁴

To measure the strength of the transmission channels, we first calculated the exposures of each quintile to the representative financial variables. Then, for each of these financial variables, we assessed their *active exposure*, defined as the difference between Q5 and Q1 exposures averaged over the study period. We used the active exposure as a measure of financial significance because it can be employed for a broad range of economic indicators (e.g., profitability, valuation, and volatility). The same active exposure corresponds to the same difference in units of cross-sectional standard deviation across all economic variables.

We indicate active exposures in blue if the sign was in line with the respective transmission channel and red if it was not. We expected a positive active exposure in the first transmission channel (i.e., higher profitability for better ESG or pillar scores) and negative active exposures in the second and third transmission channels (i.e., lower idiosyncratic risk and lower systematic risk for better ESG or pillar scores).⁵

The results for the overall MSCI ESG scores were in line with those of Giese et al. (2019a). All quintile results showed the expected sign, with the exception of historical beta for the E score quintiles. In particular, the difference in stock-specific risk (residual volatility) and systematic volatility displayed significant differences between the

⁴ Z-scores are normalized values, calculated by first subtracting the cross-sectional mean from all values and dividing the difference by the cross-sectional standard deviation. Z-scores have zero mean and unit standard deviation. Following the GEMLT methodology, for risk-related variables, we subtract cross-sectional global means. For fundamental data-related variables, we subtract cross-sectional country means to control for potential country biases in the fundamental data. Standard deviation is calculated globally.

⁵ Op. cit., Giese et al. (2019a).

EXHIBIT 5

Active Exposure Analysis of MSCI ESG Score Q5–Q1 Quintiles Including Pillar Breakdown

Transmission Channel		Expected sign Q5–Q1	Active exposure				Value of 1 standard deviation
			MSCI ESG score	E z-score	S z-score	G z-score	
	Gross Profitability	+	0.13	0.05	0.06	0.24	18.4%
	Trailing Dividend Yield	+	0.14	0.12	0.08	0.12	1.8%
	Residual CAPM Volatility	–	–0.26	–0.27	–0.12	–0.29	10.1%
	Kurtosis	–	–0.06	–0.04	–0.04	–0.05	1.68
	Systematic Volatility	–	–0.23	–0.20	–0.09	–0.33	3.9%
	Variability in Earnings	–	–0.15	–0.07	–0.14	–0.16	36.2%
	Historical Beta	–	–0.09	0.07	–0.02	–0.18	0.49
	Book-to-price	–	–0.11	–0.05	–0.01	–0.21	39.9%
	Predicted ETOP	–	–0.10	–0.07	–0.09	–0.05	3.2%
3-Channel Average			0.15	0.10	0.07	0.18	

NOTES: Data from December 2006 to December 2019 for the MSCI World Index. The last column shows the value of exposure to a variable equal to 1 and expressed in the underlying raw data. For example, an active exposure of 0.24 for the gross profitability of the G score corresponds to a difference of roughly 4.4 in the underlying profitability. A blue bar means the sign of the active exposure is in line with the economic transmission channel, and red indicates the opposite. In the third column from the left, we indicate the expected sign of Q5–Q1 based on the transmission channels: We expected a positive sign for profitability and dividend yield and a negative sign for risk-related variables.

SOURCE: MSCI ESG Research LLC.

best-rated companies (Q5) and the lowest-rated companies (Q1). Differences in profitability and valuation were also consistently in line with the transmission channels.

The E, S, and G pillars show that the G score was the most significant during this one-year measurement period, whereas the S score was the weakest. To facilitate a comparison of the different pillars, we have included an (equal-weighted) average active exposure⁶ (three-channel average—weighted according to the expected sign) and a *t*-statistic across the three transmission channels as a proxy for the overall significance for each of the E, S, and G pillar scores.

Sectoral Differences

To ascertain whether the economic transmission channels worked with different sectors, we repeated the analysis using quintile portfolios for each Global Industry Classification Standard (GICS) sector. However, when disaggregating the MSCI World Index of about 1,600 securities into 11 GICS sectors, the statistical confidence level dropped owing to the smaller number of securities in each sector.⁷

In the following analysis, we focused on three-channel averages of each pillar score in each GICS sector, as shown in Exhibit 6, to facilitate comparison. Overall, corporate governance (a dominant component of the G score) showed the most

⁶ By construction, the active exposures of each financial variable has a zero mean and standard deviation of one. Therefore, we can calculate the average difference of Q5 relative to Q1 quintiles across different financial variables as the simple average Q5–Q1 differences of active exposure.

⁷ In general, the statistical confidence expressed by the *t*-statistic increases with the square root of the number of observations in the data sample. Therefore, we can expect the average *t*-statistics in GICS sectors to be $\sqrt{11} \approx 3.3$ times lower.

EXHIBIT 6**Active Exposure Analysis for E, S, and G Pillar Q5–Q1 Quintiles across GICS Sectors**

NOTES: Data from December 2006 to December 2019 for the MSCI World Index. The average of the three pillar scores is calculated for each quintile and each month. We then plot the time-series average of the difference between Q5 and Q1 quintiles in each sector. We omitted the real estate sector because of its short history.

SOURCE: MSCI ESG Research LLC.

significant and highest average active exposure across all sectors and transmission channels. After the energy sector, G was the biggest differentiator for the financial sector, which is intuitive, given its dependence on strong G oversight, especially in areas such as risk and compliance.

S and E risk management (represented by the E and S scores) were more important to some sectors than others. The E score was a significant differentiator in the materials, health care, and energy sectors; the S score was significant mainly in the energy, utilities, and communication services sectors.

We found that different issues were more germane to some industries than others. For example, although both the energy and health care sectors had high E pillar scores, the key issues that contributed to the energy sector's E pillar score

Key Issues per GICS Subindustry for Selected GICS Sectors

SOURCE: MSCI ESG Research LLC as of December 2019.

Our economic transmission analysis focused on the short-term impact of ESG characteristics, as proxied by the key issues. In this analysis, G was the dominant pillar, as can be seen in Exhibit 7. In comparison, the S pillar showed more significant results for only certain sectors, such as energy and utilities. In those sectors,

the underlying issues that contributed to the S pillar scores were related to workers' safety or labor relations. The associated risk was more likely to materialize in the form of tangible events (e.g., strikes or accidents). Such events may have resulted in a relatively short-term impact on profitability or stock price.

In contrast, results for the E and S pillar looked weaker in sectors in which the underlying key issues used in the MSCI ESG rating methodology were driven less by event and incident risks and more by longer-term trends, such as human capital management or carbon emissions that may have eroded companies' business continuously over long periods of time.

Financial Analysis of MSCI ESG Pillar Scores

To ascertain how much the improved profitability and risk profile found in the analysis reflected companies' stock-price performance, we compared ESG indicators' top-performing Q5 and bottom-performing Q1 quintiles on two measures:

1. **Stock-price risk.** Because stock-specific risk showed the most significant differentiation in Q5 and Q1, we considered stock drawdown frequencies as a measure of stock-specific risk.
2. **Stock-price performance.** We analyze the total ESG score and individual E, S, and G pillar scores for the entire 13-year period to better understand the performance drivers over time.

Stock-Price risk of ESG pillar scores. Following Giese et al. (2019a), we employed stock-specific drawdown frequencies as a measure for stock-specific risk. We counted the number of companies that suffered a drawdown exceeding a given level during the three years following a rebalancing. We then compared the frequencies of drawdowns for the Q5 and Q1 quintiles. We used size-adjusted quintiles to ensure that potential differences in risk were not due to differences in size.

We plotted the ratio of drawdowns observed in the Q1 and Q5 quintiles (Exhibit 8). The ratio tells us the differences in stock-specific risks between companies with low and high MSCI ESG ratings, respectively.

Among the three pillar scores, G showed the most significant variation in stock-specific risk, followed by the S score and then the E score. Why? We hypothesize that G-related incidents such as ethics breaches might have affected stock prices immediately. The S pillar score contains some key issues for some sectors that could also relate to event risks, such as health and safety or data privacy and security. These risks describe the risk of incidents that may affect the stock price in the short term, such as data breaches at Equifax (Nusca 2017) or Facebook. However, other S pillar risks have surfaced more slowly, as we discuss shortly.

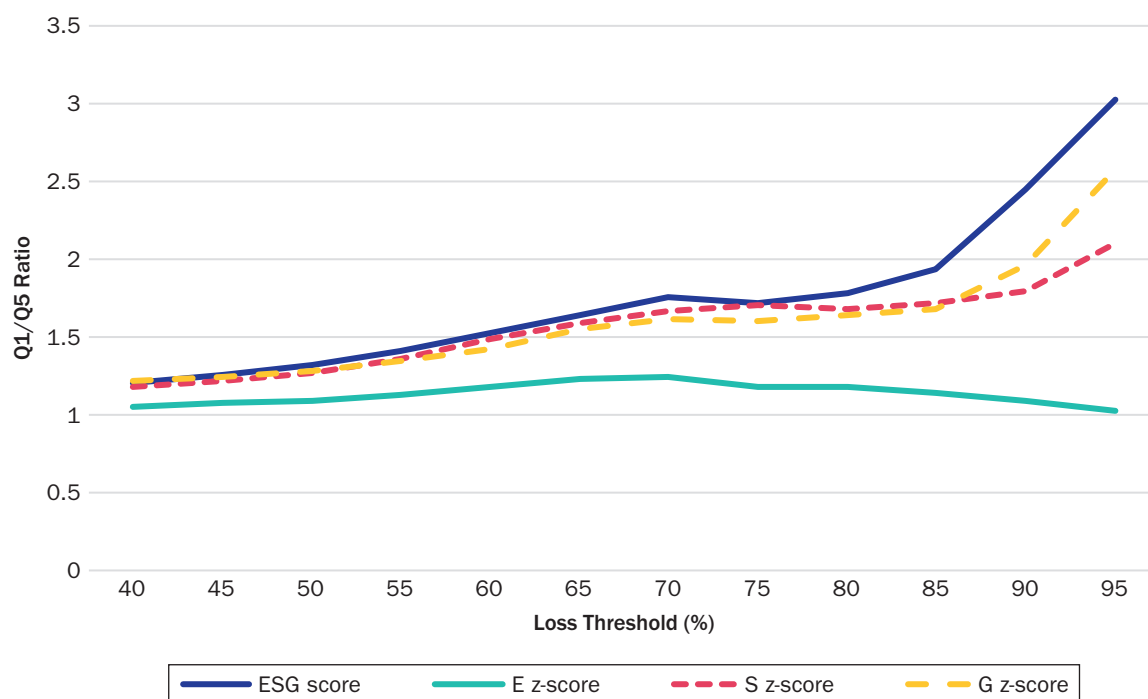
Although some environmental risks such as toxic spills may have been event driven, the key issues that underlie the E pillar score include issues related to carbon emissions management that were not event driven but may have affected companies' businesses over longer periods, such as those related to regulatory changes.⁸

We emphasize that the overall MSCI ESG score showed a Q1-to-Q5 drawdown frequency ratio that was close to but slightly higher than the G score. Thus, although G was the main contributor to explaining stock-specific risks, the industry-specific weighting scheme of key issue risk scores within the total MSCI ESG score led to a slight improvement in the Q1-to-Q5 ratio, as compared to the G score alone. This observation suggests that it may have been helpful to capture incident-driven risk

⁸For example, airlines face mandatory requirements to reduce fleet carbon intensity by 2026 through the Carbon Offsetting and Reduction Scheme for International Aviation.

EXHIBIT 8

Q1-to-Q5 Ratio of Drawdown Frequencies



NOTE: Data from December 2006 to December 2019 for the MSCI World Index.

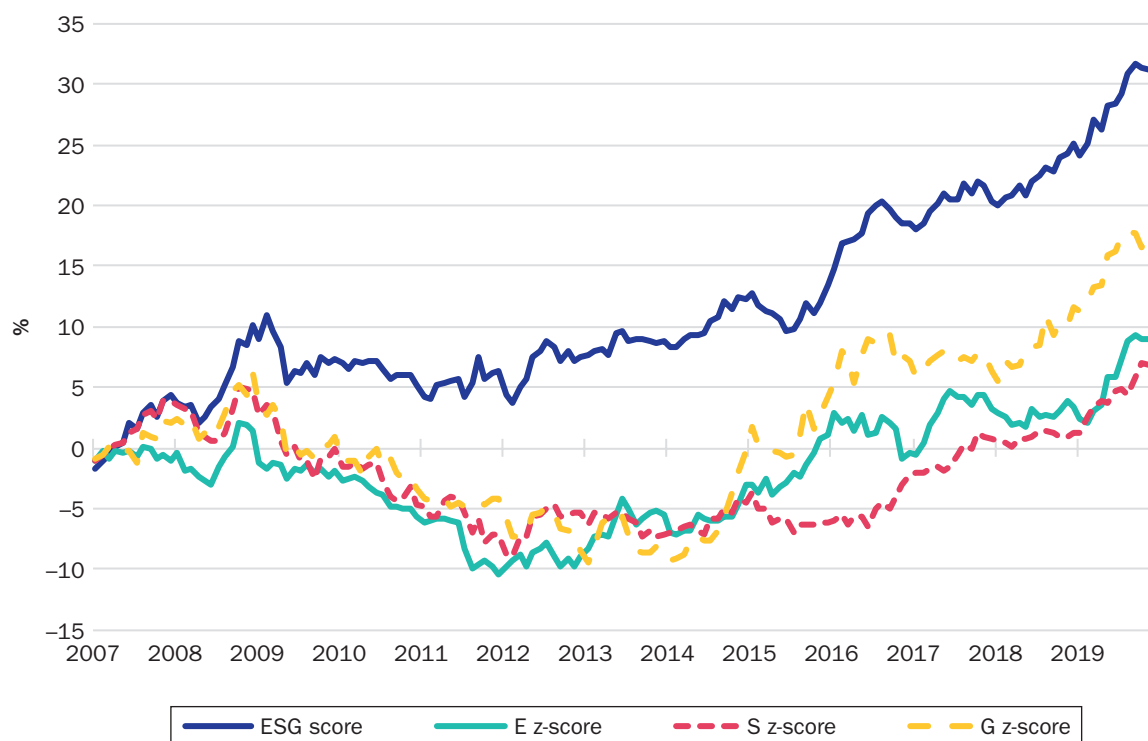
SOURCE: MSCI ESG Research LLC.

indicators such as health and safety that existed outside the G pillar in an ESG rating methodology during our study period.

Stock-price performance of E, S, and G pillar scores. We now examine the performance drivers of the individual pillars over our 13-year study period. We created equal-weighted Q5 to Q1 quintiles (based on their scores) from the MSCI World Index, subject to monthly rebalancing. Because institutional investors typically apply the overall ESG rating or score (or the underlying E, S, and G pillar scores) in their investment process, we employed the standard industry-adjusted MSCI ESG score rather than underlying key issue components, whose usage varies by sector. Moreover, we constructed quintiles for MSCI North America, MSCI EMEA, and MSCI Asia Pacific Indexes separately to control for regional differences (Giese et al. 2019b). The results are displayed in Exhibit 9.

During our 13-year study period, Q5 outperformed Q1 for all three pillars. Contrary to the analysis of economic transmission channels in the previous section, the S pillar score showed nearly the same positive results as the E pillar. Furthermore, the total ESG score exceeded each individual pillar score and was the least cyclical. Thus, the whole was more than the sum of its parts. Aggregating E, S, and G risk issues into a combined ESG score via an industry-specific pillar weighting scheme provided results superior to individual pillar scores during our 13-year study period.

This result contrasted sharply with the previous analysis of economic transmission channels, which showed that the G score had the most significant financial relevance in all three transmission channels, and with the stock-performance analysis, where performance differences between the three pillar scores were relatively small and the aggregate ESG score provided the best results.

EXHIBIT 9**Cumulative Performance of Q5–Q1 Quintile Portfolios in MSCI World Index (local currency)**

NOTES: Data from December 2006 to December 2019 for the MSCI World Index. This exhibit shows how the top-performing quintile (Q5) minus the bottom-performing quintile (Q1) performed for the aggregate ESG score and each individual pillar score.

SOURCE: MSCI ESG Research LLC.

This observation may be due to differences in the observation periods: The analysis of transmission channels considered the differences in the profitability and risk profile of quintiles the year after the publication of ESG ratings (i.e., a rolling one-year time horizon), which is more likely to reflect exposure to shorter-term event-driven risks. However, Exhibit 9 suggests that some financial effects of companies' ESG profile may have unfolded slowly over multiyear periods and may not have materialized when using a year-on-year ESG quintile analysis.

ECONOMIC TRANSMISSION CHANNELS AND ESG KEY ISSUE INDICATORS

The preceding analysis identified significantly different levels of importance for the E, S, and G pillar scores as descriptors for risks across different GICS sectors. To explain the differences, this section examines the role played by the key issues that underpin the pillar scores in each industry. As noted earlier, different sets of key issues are employed in calculating each pillar score, and their number varies considerably (see the key issue map in Exhibit 7). In MSCI's ESG rating methodology, key issues are weighted and contribute to a company's E, S, and G pillar scores (and overall ESG rating) for the select industries that have high potential exposure to the respective issue.

The universe of key issues used within the MSCI ESG rating model and the number of securities covered within the assessment have grown over time. To capture the longest data history and broadest universe of covered companies, the following analysis focuses on the 11 key issues most commonly used in calculating a company's ESG rating and uses all stocks in the MSCI ACWI IMI universe:

- **E pillar:** carbon emissions, water stress, toxic emissions, and waste
- **S pillar:** labor management, health and safety, human capital development, and privacy and data security
- **G pillar:** corporate governance, business ethics, corruption and instability, and anticompetitive practices

As in the pillar score analysis in the previous section, we examined how each of the three economic transmission channels performed across these 11 key issues by comparing the top- and bottom-scoring equal-weighted quintiles against the financial variables associated with each channel (see Exhibit 10).⁹ We employed profitability, residual volatility, and systematic volatility as target variables to test the financial significance of each of the three transmission channels.

Exhibit 10 shows the corresponding t-statistics, in which the colors indicate the direction of alignment: Blue bars indicate results where ESG characteristics were aligned with the expected financial results, and red bars indicate a misalignment.¹⁰

We found that, of the three transmission channels, the idiosyncratic-risk channel showed the most significant results across the 11 key issues tested. Furthermore, the key issues categorized under the G pillar showed, on average, the most significant results of all three channels. Companies with strong corporate governance had significantly better profitability, lower stock-specific risk, and lower systemic risk than low-scoring companies across the G key issues during the seven-year study period between December 2012 and December 2019. In addition, within the set of S key issues, health and safety showed significant empirical results.

These results indicate that, during the study period, financial markets were largely focused on events that could immediately affect company valuations. What about key issues that capture intangible ESG characteristics over longer periods?

Event versus erosion risks. Some key issues aim to capture risks related to event risks (e.g., those of fraud or accidents) that can affect companies' stock price over short periods. Other key issues, such as resource efficiency, relate more to long-term risks that can erode a company's stock price over long periods. Some key issues may exhibit characteristics of both event and erosion risk.

To confirm that these two types of risk are present in key issues, we used equal-weighted quintile portfolios for each key issue and compared the Q5 (best ESG characteristics) to the Q1 quintile (worst) using the following measures:

- **Event risk:** For each key issue, we created equal-weighted quintile portfolios, which we rebalanced on a monthly basis. We compared the frequency with which the top-scoring (Q5 quintile) and the bottom-scoring (Q1 quintile) companies experienced a 90% or greater stock-price drawdown in the 36 months after the publication of a company's rating. We used the Q1/Q5

⁹The financial variables are transformed into z-score format, or standardized, by subtracting the mean and dividing by the standard deviation. Thus, financials variables are brought to a common scale and are directly comparable.

¹⁰The t-statistics indicate the likelihood that the difference between Q5 and Q1 is not accidental. A t-statistic over 2 is generally viewed as not accidental.

EXHIBIT 10

Most Common ESG Key Issues and Significance of Their Q5–Q1 Quintile Exposure to Target Financial Variables

Key Issue t-statistics	Pillar	Gross Profitability	Residual CAPM Volatility	Systematic Volatility
Carbon emissions	E	1.42	3.36	-2.29
Water stress		0.78	3.39	1.83
Toxic emissions		1.23	2.00	1.15
Labor management	S	-0.58	3.06	1.95
Health & safety		2.58	6.15	4.38
Human capital		0.91	1.44	-2.04
Privacy & data security		1.25	1.74	1.62
Corporate governance	G	5.18	5.70	5.99
Business ethics		2.78	2.98	1.97
Corruption & instability		-0.49	6.63	3.35
Anticompetitive practices		3.15	1.94	1.42

NOTES: Data from 2012 to 2019 on all constituents of the MSCI ACWI IMI. We used a shorter period to obtain reasonable coverage for the key issue scores.

SOURCE: MSCI ESG Research.

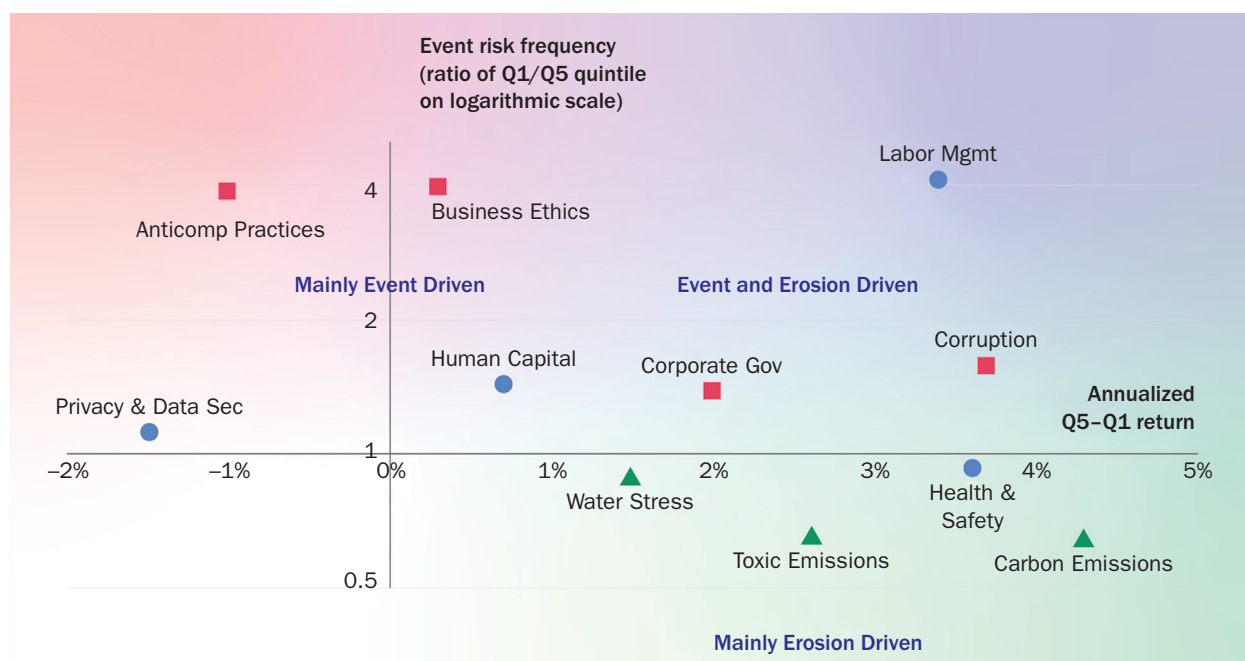
frequency ratio as a measure of effectiveness in identifying event risk—the higher the ratio, the more effective.

- **Erosion risk:** We compared the annualized cumulative return of these top-scoring (Q5 quintile) versus bottom-scoring (Q1 quintile) companies for each key issue as a measure of erosion risk.

Exhibit 11 summarizes both risk measures for the 11 key issues we studied, with the log of the drawdown-frequency ratio indicating event risk and the performance difference indicating erosion risk. We found that seven of the 11 issues showed a positive contribution in terms of identifying differences in event-driven (i.e., stock-specific) risks, whereas 9 showed a positive Q5–Q1 performance contribution cumulatively over the study period.

We saw distinct differences across the issues categorized under the E, S, and G pillars. Erosion-driven ESG issues understandably grab fewer headlines than the more abrupt and sometimes dramatic event-driven issues. How have these key issues performed over the entire seven-year study period? Exhibit 12 shows the performance of the equal-weighted Q5–Q1 portfolios over time.

Carbon emissions (E pillar) showed the most significant gross outperformance of all key issues, with health and safety and labor management (both S pillar) and corruption (G pillar) in second, third, and fourth place, respectively. Between 2012 and 2019, for these four top-performing key issues, the outperformance of the top-scoring companies over the bottom companies ranged from 26% (carbon emissions) to 21% (labor management) cumulatively, or 3.8% and 3.0% on an average annualized basis. These top-performing key issues indicate that erosion risks were

EXHIBIT 11**Event Risk versus Erosion Risk of 11 MSCI ESG Key Issues**

NOTES: Data from 2012 to 2019 on constituents of the MSCI ACWI IMI. Triangles represent E key issues, circles S key issues, and squares G key issues.

SOURCE: MSCI ESG Research.

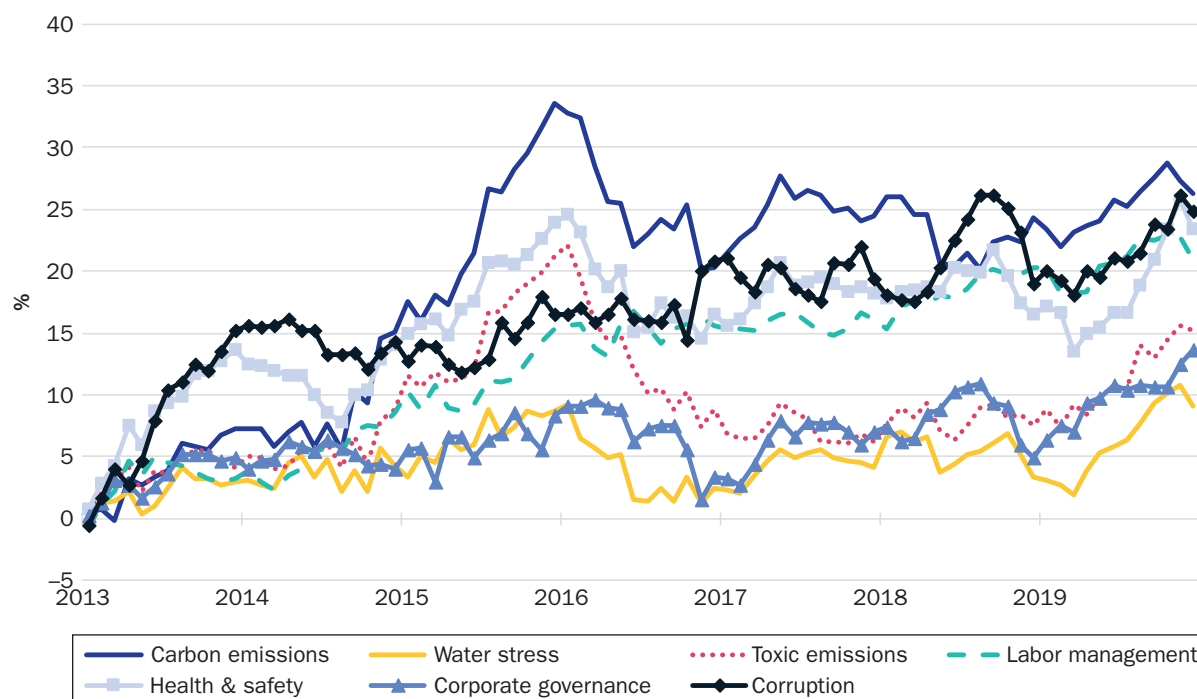
more evenly distributed across the three pillars than event risks, which were more concentrated in the G pillar.

With the exception of labor management, which also exhibited strong event-risk characteristics, the performance shown in Exhibit 12 were not driven by large losses suffered from distinct negative events during the study period. As Exhibit 11 indicated, these key issues reflected minimal event-risk differences; instead, the gains in returns accumulated gradually throughout the study period. This confirms that these key issues have presented erosion risks that more subtly but cumulatively influenced stock prices over longer periods of time (Exhibit 12).

In addition to considering absolute-performance differentials, we also employed MSCI's GEMLT model to parse the extent to which these performance differentials could be attributed to common factor exposures or were related to stock-specific performance (Exhibit 13). After controlling for other factors, we found that 10 of 11 key issues showed a positive stock-specific performance contribution, with only privacy and data security showing a negative result. In fact, of the 11 key issues, five showed a stock-specific performance contribution of at least 1% per year over the study period.

CONCLUSION

ESG strategies are typically based on incorporating some type of ESG rating or score to capture the financially significant ESG characteristics of a company. However, what indicators support the construction of the rating? Within the MSCI ESG research methodology, key issues scores underpin MSCI ESG ratings. We tested these ESG

EXHIBIT 12**Cumulative Q5–Q1 Performance for Erosion-Driven Key Issues**

NOTES: Data from 2012 to 2019 on all constituents of the MSCI ACWI IMI. This exhibit shows how the top-scoring quintile (Q5) minus the bottom-scoring quintile (Q1) performed for erosion-driven key issues (in US dollars).

SOURCE: MSCI ESG Research LLC.

EXHIBIT 13**Q5–Q1 Total Active Performance in US Dollars and Specific Contribution**

	Total Active	Style	Industry	Country	Specific	Currency	Volatility	Return/risk
MSCI ESG score	3.3%	2.4%	0.3%	1.1%	1.1%	-1.7%	4.5%	0.73
E Pillar score	2.8%	2.4%	0.0%	0.5%	1.2%	-1.2%	4.4%	0.63
S Pillar score	0.1%	1.1%	-0.2%	0.0%	0.2%	-1.1%	2.9%	0.03
G Pillar score	4.3%	1.9%	0.5%	1.8%	1.1%	-0.9%	4.4%	0.98
Carbon emissions	4.3%	2.8%	1.2%	0.6%	1.1%	-1.4%	6.3%	0.68
Water stress	1.5%	2.2%	-0.3%	0.6%	0.3%	-1.3%	4.6%	0.31
Toxic emissions	2.6%	1.8%	-0.9%	0.5%	2.6%	-1.3%	5.2%	0.50
Labor mgmt	3.4%	1.3%	0.4%	0.8%	1.7%	-0.7%	3.5%	0.97
Privacy	-1.5%	1.0%	-0.1%	-0.4%	-2.3%	0.2%	4.9%	-0.31
Health & safety	3.6%	3.3%	0.1%	1.3%	0.7%	-1.7%	5.2%	0.69
Human capital	0.7%	1.1%	0.4%	-0.7%	0.5%	-0.6%	5.0%	0.14
Corp gov	2.0%	1.2%	-0.6%	1.6%	0.7%	-0.9%	4.5%	0.45
Anticomp	-1.0%	-0.6%	-0.4%	-0.1%	0.6%	-0.5%	5.8%	-0.17
Business ethics	0.3%	0.4%	-1.5%	0.0%	1.2%	0.1%	4.8%	0.05
Corruption	3.7%	2.7%	-1.0%	1.8%	1.2%	-1.1%	5.6%	0.66

NOTE: Period: 2013–2019; all covered securities within MSCI ACWI IMI.

SOURCE: MSCI ESG Research LLC.

indicators by considering their economic transmission channels to financial variables and long-term stock performance.

Within our short-term-oriented analysis of economic transmission channels, the top quintiles showed higher profitability and lower levels of idiosyncratic and stock-specific risk than the bottom quintile for the majority of ESG pillar and key issue indicators. G indicators showed the most significant financial significance at a pillar and key issue level. On a sectoral level, the telecom, materials, and energy sectors showed the most significant results. Consumer staples showed the lowest level of financial significance.

However, when analyzing long-term stock performance, overall E, S, and G pillar scores and 10 of 11 key issue scores showed better results, with more uniform results across E, S, and G indicators than in the analysis of transmission channels.

One explanation is that different ESG indicators affected financial variables over different time horizons. Some G-related risks immediately affected stock prices and thus showed higher levels of statistical confidence when considering volatility or frequency of large drawdowns. However, some E or S indicators, such as the carbon emission key issue, have developed slowly but have had long-lasting financial effects.

When considering financial performance over longer periods, we found that using a more balanced and industry-specific weighting showed better long-term relevance than the individual pillar indicators, including the G score.

REFERENCES

- Berg, F., J. Kölbel, and R. Rigobon. 2019. "Aggregate Confusion: The Divergence of ESG Ratings." Research paper no. 5822-19, MIT Sloan.
- Eccles, R., I. Ioannou, and G. Serafeim. 2014. "The Impact of Corporate Sustainability on Organizational Processes and Performance." *Management Science* 60 (11): 2835–2857.
- El Ghoul, S., O. Guedhami, C. Kwok, and R. Mishra. 2011. "Does Corporate Social Responsibility Affect the Cost of Capital?" *Journal of Banking and Finance* 35 (9): 2388–2406.
- Fatemi, A., I. Fooladi, and H. Tehranian. 2015. "Valuation Effects of Corporate Social Responsibility." *Journal of Banking & Finance* 59 (Issue C): 182–192.
- Giese, G., L.-E. Lee, D. Melas, Z. Nagy, and L. Nishikawa. 2019a. "Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk and Performance." *The Journal of Portfolio Management* 45 (5): 69–83.
- . 2019b. "Performance and Risk Analysis of Index-Based ESG Portfolios." *The Journal of Index Investing* 9 (4): 46–57.
- Gregory, A., R. Tharyan, and J. Whittaker. 2014. "Corporate Social Responsibility and Firm Value: Disaggregating the Effects on Cash Flow, Risk and Growth." *Journal of Business Ethics* 124 (4): 633–657.
- Lodh, A. 2020. "ESG and the Cost of Capital." MSCI Blog.
- Nusca, A. 2017. "Equifax Stock Has Plunged 18.4% Since It Revealed Massive Breach." *Fortune*, Sept. 11.

Disclaimer

The information contained herein (the "Information") may not be reproduced or re-disseminated in whole or in part without prior written permission from MSCI ESG Research. The Information may not be used to verify or correct other data; to create any derivative works; to create indexes, risk models, or analytics; or in connection with issuing, offering, sponsoring, managing, or marketing any securities, portfolios, financial products, or other investment vehicles. Historical data and analysis should not be taken as an indication or guarantee of

any future performance, analysis, forecast, or prediction. MSCI ESG Research is provided by MSCI Inc.'s subsidiary, MSCI ESG Research LLC, a Registered Investment Adviser under the Investment Advisers Act of 1940. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body. None of the Information or MSCI index or other product or service constitutes an offer to buy or sell, or a promotion or recommendation of, any security, financial instrument, or product or trading strategy. Further, none of the Information is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. The Information is provided "as is" and the user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF MSCI INC. OR ANY OF ITS SUBSIDIARIES OR ITS OR THEIR DIRECT OR INDIRECT SUPPLIERS OR ANY THIRD PARTY INVOLVED IN THE MAKING OR COMPILING OF THE INFORMATION (EACH, AN "INFORMATION PROVIDER") MAKES ANY WARRANTIES OR REPRESENTATIONS AND, TO THE MAXIMUM EXTENT PERMITTED BY LAW, EACH INFORMATION PROVIDER HEREBY EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. WITHOUT LIMITING ANY OF THE FOREGOING AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, IN NO EVENT SHALL ANY OF THE INFORMATION PROVIDERS HAVE ANY LIABILITY REGARDING ANY OF THE INFORMATION FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL (INCLUDING LOST PROFITS), OR ANY OTHER DAMAGES EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited. Privacy notice: For information about how MSCI collects and uses personal data, please refer to our Privacy Notice at <https://www.msci.com/privacy-pledge>.

To order reprints of this article, please contact David Rowe at d.rowe@pageantmedia.com or 646-891-2157.