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KEY FINDINGS

- This article explores the impact of incorporating ESG factors on the risk and performance of corporate-bond portfolios.
- The authors found ESG ratings had characteristics distinct from credit ratings and delivered additional insights into risk and performance: Higher-ESG-rated issuers tended to have stronger cash flow metrics, lower levels of ex ante risk, and less-frequent severe incidents than lower-ESG-rated issuers.
- The aggregate MSCI ESG Ratings score showed stronger results in terms of reducing risk than the individual E-, S-, and G-pillar scores. Within the three pillars, the S pillar showed the strongest performance in returns, while the E pillar showed the strongest differentiation in terms of risk over the broader universe.

ABSTRACT

This article extends the authors' research on how environmental, social, and governance (ESG) characteristics have affected equity investing and corporate bonds. Unlike with equities—where MSCI's previous research shows that MSCI ESG Ratings had positive effects on stocks' risk and return characteristics—the authors find that a corporate bondholder's main ESG focus could be mitigating downside risk, rather than capturing upside. They also examine whether ESG added value beyond credit ratings—a significant point of interest for bondholders. In short, ESG complemented credit ratings. ESG ratings had characteristics distinct from credit ratings and delivered additional insights into risk and performance. ESG was in general more financially relevant in high-yield (HY) bonds than in investment-grade (IG) bonds and more relevant in IG bonds with longer, rather than shorter, maturities. Higher-ESG-rated issuers tended to have stronger cash flow metrics, lower levels of ex ante risk, and less-frequent severe incidents than lower-rated-ESG issuers.

Environmental, social, and governance (ESG) investing is a very broad field with many different investment approaches addressing various investment objectives across asset classes. An increasing number of studies from both academia and the asset-management industry have investigated the financial benefits of ESG investing. For example, Friede, Busch, and Bassen (2015) conducted a meta-analysis of over 2,000 such studies. It is interesting to note that most of the research contribution in this field has focused on equity markets, despite the fact that asset owners, who typically diversify their investments across asset classes, also have significant exposure to fixed income. Bonds have limited upside, but in a negative scenario, investors can potentially lose all their invested capital.

Some research contributions on ESG in fixed income are worth mentioning, however. Desclee et al. (2016) used MSCI ESG Ratings and individual E-, S-, and G-pillar scores within the Bloomberg Barclays Global Aggregate Index universe and analyzed the financial risk and performance of the Bloomberg Barclays MSCI Sustainability Indexes, which are based on MSCI ESG Ratings. They showed that higher-ESG-rated corporate bonds had lower systematic risk, lower spreads. and therefore higher valuations while controlling for common corporate-bond factors. They also observed that issuers with high G-pillar scores showed lower frequencies of credit-rating downgrades.

Bahra and Thukral (2020) analyzed the financial relevance of MSCI ESG scores and individual pillar scores in the corporate-bond market. They found that correlations among the three pillar scores were very low—which mirrored the finding in Giese, Lee, and Nagy (2020)—and that there were no significant correlations between MSCI ESG scores and credit ratings. Their main finding was that MSCI ESG Ratings were additive to credit ratings in their financial relevance: MSCI ESG Ratings can be used to reduce risks (e.g., volatility and drawdowns) and, in some cases, improve risk-adjusted returns. They explained their finding with the fact that the contingent liabilities related to ESG issues are not necessarily factored into credit-rating assessments.

To show that the economic rationale is financially relevant for equity investments, Giese et al. (2019a) emphasized the need to test ESG ratings within an economic model that allows for an assessment of causality. The authors identified three so-called economic-transmission channels to explain how ESG characteristics may influence the performance of corporate equity:

- **Cash flow channel**: High-ESG-rated companies are more competitive and can generate abnormal returns, thus leading to higher profitability and dividend payments.
- **Idiosyncratic-risk channel:** High-ESG-rated companies are better at managing company-specific business and operational risks and therefore have a lower probability of suffering incidents that can impact their share price. Consequently, their stock prices display lower idiosyncratic tail risks.
- **Systematic-risk channel:** High-ESG-rated companies tend to have lower exposure to systematic-risk factors. Therefore, their expected cost of capital is lower, leading to higher valuations in a discounted-cash-flow (DCF) model framework.

In this article, we build on this previous research to understand how much these economic-transmission channels for equity investments may also influence corporate bonds' financial risk and performance characteristics. To be precise, we will assess how far the aforementioned economic-transmission channels can be supported by empirical evidence in the corporate-credit market. How far can MSCI ESG Ratings provide similar or different financial value compared with credit ratings?

Therefore, we first explain the data that forms the basis of our analysis and its general characteristics. We then offer an overview of the methods used to validate the transmission channels. In the main body, we present our empirical findings. Finally, in the performance section, we show the risk and return properties of ESG portfolios over the full sample set.

DATA AND METHODOLOGY

The empirical analysis is based on a corporate-bond universe defined by the following indexes:

EXHIBIT 1

Statistics across ESG Terciles for Composite Universe

ESG Terciles	Number of Issuers	ESG Score	OAS (bps)	Effective Duration	Spread Duration	MSCI Average Credit Rating
T1 (low)	478 (584)	2.4 (2.7)	409 (757)	4.5 (4.6)	4.6 (4.5)	11.3 (11.9)
T2	478 (584)	4.8 (5.2)	289 (390)	4.8 (5.1)	4.8 (5.1)	9.9 (9.5)
T3 (high)	478 (584)	7.5 (7.8)	183 (278)	5.0 (5.4)	5.0 (5.4)	8.0 (8.1)
Universe	1434 (1752)	4.9 (5.2)	294 (475)	4.8 (5.0)	4.8 (5.0)	9.7 (9.8)

NOTES: The mean of equal-weighted-average monthly samples from January 2014 to June 2020 with most recent value (as of June 30, 2020) are in parentheses. Sample universe is restricted to issuers with available ESG scores. The MSCI average credit rating is the average rating of S&P's and Moody's—a lower credit rating number represents higher credit quality.

- MSCI USD Investment Grade (USD IG) Corporate Bond Index
- MSCI USD High Yield (USD HY) Corporate Bond Index
- MSCI EUR Investment Grade (EUR IG) Corporate Bond Index
- MSCI EUR High Yield (EUR HY) Corporate Bond Index

To facilitate better comparison among the four indexes, we restrict the analysis universe to only those issuers with available ESG scores within each index and refer to this restricted universe as simply the "analysis universe." In most of the analysis, we also include a ***composite universe*** defined as the combination of the four individual universes. The online appendix shows the profile of these indexes across various metrics.

Analysis Outline

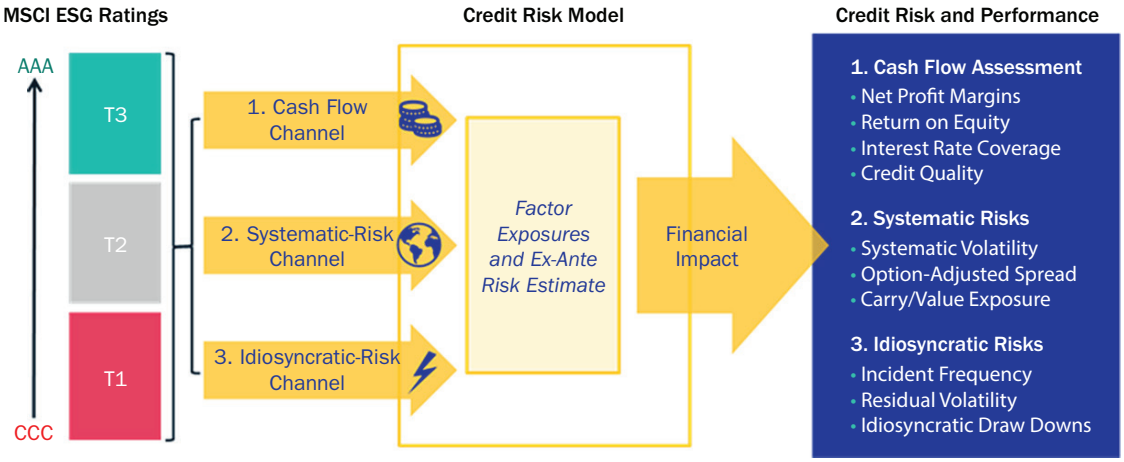
To analyze the relationship between ESG scores and financial variables, we first divided the analysis universe into terciles based on industry-adjusted ESG scores, with each tercile containing equal numbers of issuers and each issuer represented by its market-value-weighted corporate bonds. We chose to use industry-adjusted ESG scores over absolute ESG scores for our analysis, as the industry-adjusted score provides a "best in class" approach while the absolute score offers an aggregated view of a company's total potential risks but may not differentiate as well between members of the same industry (Sayani and Kaplan 2020). To disentangle the impact of duration and ESG, one may consider creating duration-neutral terciles. However, we found that the differences in duration among the terciles were minimal; for that reason, creating duration-neutral terciles would have added complexity for little benefit (see Exhibit 1 for the composite universe and the online appendix for each subuniverse).

With respect to our analysis universe, we first analyze how ESG related to traditional corporate-bond metrics, such as the sensitivity of option-adjusted spreads by quality and maturity. In the main body, we assess the aforementioned transmission channels by examining how ESG score terciles are linked to financial variables that are part of the expected economic transmission, as summarized in Exhibit 2. For each transmission channel, we chose financial variables that are commonly used in the financial literature and may support each transmission channel's economic argument.

The idiosyncratic- and systematic-risk channels rely on an excess-return risk model based on a cross-sectional regression accounting for both traditional (e.g., duration-times-spread [DTS] sector exposure) and credit style factors (e.g., quality, value, size, carry, risk, and liquidity, all scaled by spread duration). It is important to note that the idiosyncratic risk of ESG portfolios that we obtained from this model is by design, after accounting for credit ratings (quality), among other factors.

EXHIBIT 2

Overview of ESG Tercile Analysis to Validate Transmission Channels

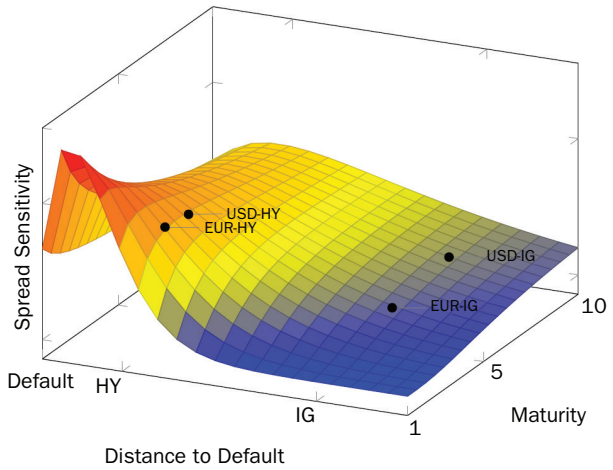


NOTES: This exhibit illustrates the hypothetical financial impact of ESG (left) characteristics on credit-related financial variables (right). Credit-risk sensitivities (middle) explain the strength of this hypothetical relationship.

SOURCE: MSCI ESG Research.

EXHIBIT 3

Illustrative Spread Sensitivity of Merton Model



NOTE: This exhibit shows the geometrical average of the Merton model's risk sensitivities (equations are in the online appendix) and the location of HY and IG in EUR and USD on the sensitivity surface.

The study period for the analysis is January 2014–June 2020, which was chosen to obtain enough ESG coverage of the underlying index to draw meaningful conclusions. All analysis was conducted at the issuer level and was based on month-end data sampling.

ESG AND TRADITIONAL CORPORATE-BOND METRICS

ESG ratings can help assess companies' exposure to and management of ESG risks that can have a potential impact on companies' valuation. How does ESG in corporate bonds relate to traditional credit-rating analysis? How much overlap is there among the two ratings? How is ESG priced in the market? These are some of the questions we address in this section.

The Price of ESG in Terms of Spreads

The option-adjusted spread (OAS) reflects the market price of credit risk, encapsulating the probability of default, loss given default, and other considerations such as liquidity and risk aversion. Typically, bonds with lower credit ratings have a wider OAS. How does OAS relate to the ESG rating of issuers?

Merton (1974) showed how the Black–Scholes option pricing theory can be used to estimate a firm's probability of default and credit spreads. Based on the Merton model, we would expect that if the aforementioned transmission channels affect issuers' credit risk, this should show up in the OAS. In this setup, one might expect the potential financial relevance of ESG in explaining credit risk to be a nonlinear function of both credit quality and maturity (i.e., probability of default). As shown in Exhibit 3, we expect ESG to have a greater impact on high-yield (HY) bonds than on

investment-grade (IG) bonds; and within IG, we expect the impact to be greater on longer-dated bonds than on shorter-dated bonds.

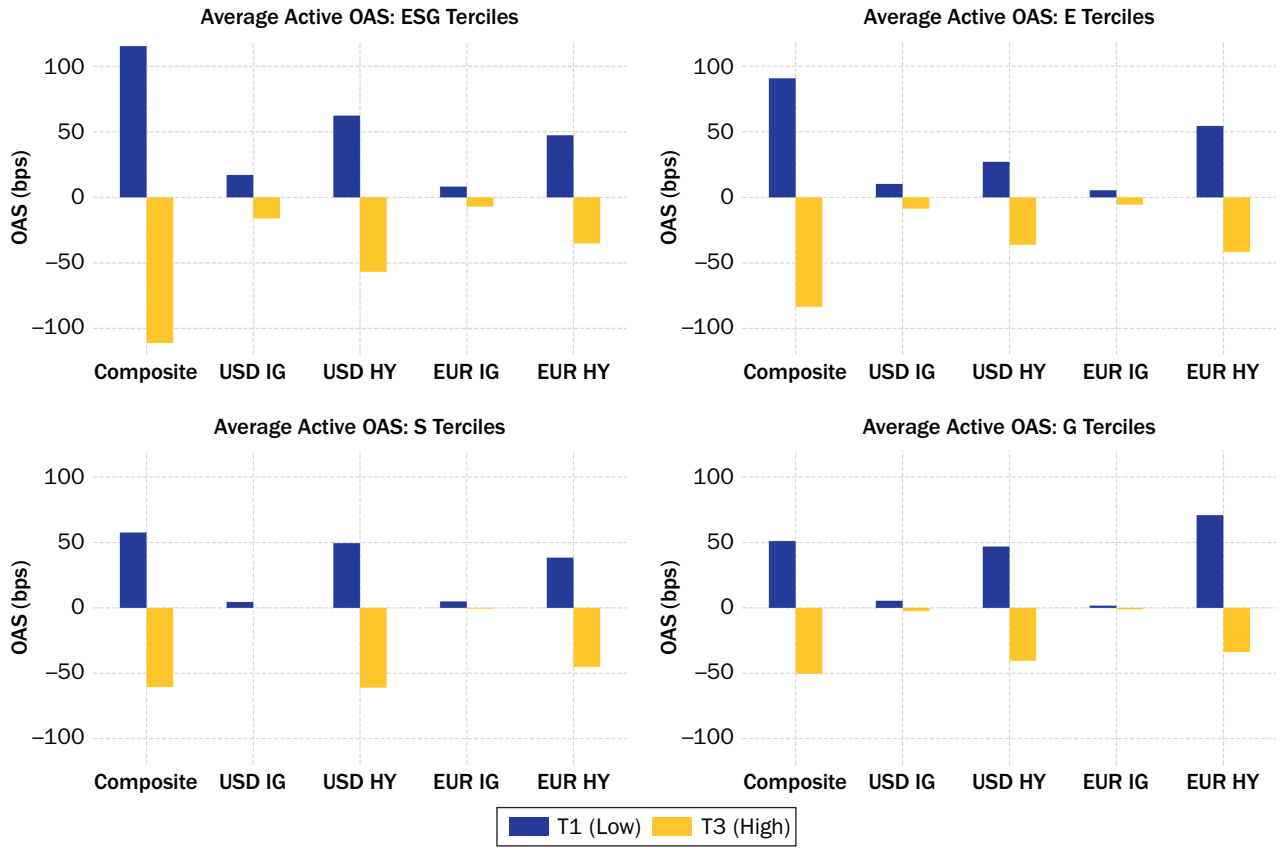
To validate these economic arguments, we will look at the average credit spreads of the lowest- (tercile 1) and highest-ESG-rated (tercile 3) issuers (based on industry-adjusted ESG scores), relative to their respective universes, as well as across E, S, and G pillars. In addition, we will look at OAS differences across ESG score terciles for different maturities.

To start with, Exhibit 4a plots the average OAS across universes for ESG and individual E, S and G terciles, and Exhibit 4b shows the ESG spread, OAS spread (including relative OAS spread), and spread–duration spread between high- and low-ESG-score terciles across the universes. In our setup, we found that the differences in spread durations between the terciles were negligible across universes and hence did not explicitly control for duration.

Across all universes, exposure to high historical average MSCI ESG Ratings coincided with a tighter OAS relative to low-ESG-rated securities. This trend continues across all individual pillars and markets. Interestingly, Exhibit 4a shows that the overall ESG score generally resulted in more-pronounced OAS-tercile differences across all issuer universes than the individual pillar scores—that is, the total ESG score was the best identifier for differences of credit risk.

EXHIBIT 4A

Active OAS per ESG Terciles



NOTE: This exhibit shows the mean of the month-end equal-weighted average OAS of the lowest (T1) and highest (T3) ESG score terciles, relative to their respective analysis universes, from January 2014–June 2020.

EXHIBIT 4B

Average ESG and OAS Spread between High- and Low-ESG Terciles

	Composite	USD IG	USD HY	EUR IG	EUR HY
(1) ESG Score Spread	5.1	5.0	4.2	4.8	5.0
(2) OAS Spread (bps)	–226	–33	–119	–15	–83
(3) OAS Relative Spread (%)	–73.5	–24.2	–22.5	–13.9	–17.7
(4) Spread–Duration Spread	0.5	–0.3	–0.0	0.1	0.4
Ratio |(2)/(1)|	44.3	6.6	28.3	3.1	16.6
Ratio |(3)/(1)|	14.4	4.8	5.4	2.9	3.5

NOTE: This exhibit shows the mean of the month-end equal-weighted averages from January 2014–June 2020. (1), (2), and (4) are average spreads calculated as [T3 (high) – T1 (low)]; (3) is the average relative spread calculated as [T3 (high) – T1 (low)]/Universe.

EXHIBIT 5

Average ESG and OAS Spreads across Time-to-Maturity Buckets

	USD IG		USD HY		EUR IG		EUR HY	
	Short	Long	Short	Long	Short	Long	Short	Long
(1) ESG Score Spread	5.1	5.0	4.3	4.2	4.8	4.8	4.9	5.1
(2) OAS Spread (bps)	–28	–27	–156	–91	–14	–16	–92	–86
(3) Spread–Duration Spread	–0.1	0.2	–0.1	–0.2	0.0	0.1	0.2	0.4
Ratio |(2)/(1)|	5.5	5.4	36.3	21.7	2.9	3.3	18.8	16.9

NOTES: This exhibit shows the mean of month-end equal-weighted averages from January 2014–June 2020. (1), (2), and (3) are average spreads calculated as [T3 (high) – T1 (low)]. Short/Long constitute bonds with <5/>5 years remaining time to maturity.

Exhibit 4b shows that the OAS spread between the high- and low-ESG-score terciles, per unit of ESG-score spread, is higher for HY than for IG, across both USD and EUR and for both absolute as well as relative OASs (last two rows of the table). Overall, this confirms our conjecture that ESG was more relevant for differentiating risks in HY than in IG.

The second step is to validate the dependency of results on the time to maturity. Exhibit 5 compares OAS tercile differences per unit of ESG-score spreads, using the absolute (T3 – T1) OAS[1] for shorter-dated (less than five years to maturity) and longer-dated (more than five years to maturity) bonds across the universes. We found that the OAS spread compression per unit of ESG-score spread was higher for longer-dated bonds for the EUR IG universe and was higher for shorter-dated bonds in both the USD HY and EUR HY universes. For the USD IG universe, we found the spread compression was not materially different between the longer- and shorter-dated bonds.

Overall, our findings are broadly in line with theoretical findings from the Merton model (Exhibit 3) that the spreads depended on credit quality (HY versus IG) and time to maturity in a nonlinear fashion.

ECONOMIC-TRANSMISSION CHANNELS INTO CREDIT RISK

We now investigate and validate the three transmission channels to explain how ESG characteristics may influence corporate credit risk and performance.

[1] We exclude relative spreads from our maturity analysis because the OASs for short-dated bonds in IG were too small and consequently led to unreliable ratios.

EXHIBIT 6

Relative Competitiveness of ESG Terciles (active net-margin exposure)

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 > T1	(T3 – T1) > 0
Universe	Mean	Mean	Mean	25th %ile	75th %ile	% of Sample	p-Value
Composite	–0.11	0.15	0.25	0.21	0.29	100.0	0.000***
USD IG	0.00	0.04	0.03	–0.06	0.12	50.0	0.017**
USD HY	0.01	–0.03	–0.04	0.12	0.06	47.4	0.997
EUR IG	–0.06	0.05	0.11	0.07	0.16	84.6	0.000***
EUR HY	–0.08	0.11	0.20	0.02	0.45	75.6	0.000***

NOTES: This exhibit shows the equal-weighted average sector-neutral exposures to company net margins, relative to their respective analysis universes, from January 2014–June 2020 (78 month-end samples). The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. ***, **, and * indicate significance at the 99%, 95%, and 90% confidence levels, respectively.

Cash Flow Channel

The cash flow channel in equities showed that high-ESG-rated companies showed better return on equity (ROE), higher earnings, and more stable earnings compared to low-ESG-rated companies. In this section, we will test the cash flow transmission channel for corporate bonds along the following hypothesis:

We test the above transmission channel step by step as follows.

Step 1: Were companies with high ESG ratings more competitive? We use companies' net profit margins as an indicator of competitiveness. Exhibit 6 shows the active net-margin exposure on a sector-neutral basis for ESG terciles. We observe that companies with high ESG ratings showed a strong competitive advantage in terms of profit margins compared with lower-rated companies across all universes except USD HY.

Step 2: Were companies with high ESG ratings more profitable? Exhibit 7 looks at the ROE exposure of ESG terciles on a sector-neutral basis: We observe that across all universes, high-ESG-rated companies showed higher levels of ROE compared to low-rated companies.

Step 3: Did companies with high ESG ratings have stronger interest coverage ratios? The final question in the cash flow channel is whether higher profitability of high-ESG-rated companies translated into stronger interest coverage ratios, as measured by their cash flow from operations (CFO)-to-interest expense ratio,[2] which we analyze in Exhibit 8. We observed that high-ESG-rated companies had higher interest coverage ratio exposure, on average, on a sector-neutral basis, than low-rated companies across all universes.

Step 4: Have companies with high ESG ratings shown greater distance to default? Ultimately, we are interested in whether high-ESG-rated companies—through the economic arguments of better competitiveness, better profitability, and better interest-rate coverage—have ultimately shown a wider distance to default in the logic of the Merton model. In Exhibit 9, we proxy distance to default (which is hard to observe)

[2] We exclude financial companies when looking at interest coverage ratios due to the nature of their business model.

EXHIBIT 7

Profitability of ESG Terciles (active ROE exposure)

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 > T1	(T3 – T1) > 0
Universe	Mean	Mean	Mean	25th %ile	75th %ile	% of Sample	p-Value
Composite	–0.07	0.10	0.17	0.09	0.23	96.2	0.000***
USD IG	–0.04	0.10	0.13	0.01	0.26	76.9	0.000***
USD HY	0.01	0.01	0.02	–0.04	0.08	53.8	0.040**
EUR IG	0.00	0.02	0.02	–0.06	0.09	57.7	0.074*
EUR HY	0.02	0.06	0.04	–0.17	0.25	64.1	0.094*

NOTES: This exhibit shows the equal-weighted average sector-neutral exposures to company ROE, relative to their respective analysis universes, from January 2014–June 2020 (78 month-end samples). The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. ***, **, and * indicate significance at the 99%, 95%, and 90% confidence levels, respectively.

EXHIBIT 8

Interest Coverage Ratio of ESG Terciles

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 > T1	(T3 – T1) > 0
Universe	Mean	Mean	Mean	25th %ile	75th %ile	% of Sample	p-Value
Composite	–0.22	0.25	0.47	0.43	0.54	100.0	0.000***
USD IG	–0.08	0.08	0.16	0.06	0.27	92.3	0.000***
USD HY	–0.04	0.07	0.12	0.04	0.19	87.2	0.000***
EUR IG	–0.04	–0.02	0.02	–0.08	0.14	60.3	0.096*
EUR HY	–0.09	0.08	0.17	0.01	0.30	75.6	0.000***

NOTES: This exhibit shows the equal-weighted average sector-neutral exposures to companies' interest coverage ratio (interest expenses covered by cash flow from operations) relative to their respective analysis universes, excluding financial companies, from January 2014–June 2020 (78 month-end samples). The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. *** and * indicate significance at the 99% and 90% confidence levels, respectively.

EXHIBIT 9

Credit Quality of ESG Terciles (active quality exposure)

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 > T1	(T3 – T1) > 0
Universe	Mean	Mean	Mean	25th %ile	75th %ile	% of Sample	p-Value
Composite	–0.37	0.42	0.79	0.72	0.89	100.0	0.000***
USD IG	–0.19	0.21	0.40	0.34	0.46	100.0	0.000***
USD HY	–0.07	0.11	0.18	0.08	0.26	97.4	0.000***
EUR IG	–0.07	0.02	0.08	0.05	0.13	88.5	0.000***
EUR HY	–0.10	0.09	0.19	0.06	0.35	80.8	0.000***

NOTES: This exhibit shows the equal-weighted average sector-neutral exposures to companies' credit quality (as defined by its average credit rating), relative to their respective analysis universes from January 2014–June 2020 (78 month-end samples). The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. *** indicates significance at the 99% confidence level.

by credit quality. Credit quality is defined as the market-value-weighted average credit rating aggregated from the issuers' bonds in the respective universes.

Across each universe, we found data supporting the assertion that high-ESG-rated issuers (Tercile 3) had a higher exposure to quality, which reflects lower default risks (assuming recovery values are fixed) within their respective universes, especially when compared to lowest-ESG-rated issuers (Tercile 1). The difference was most pronounced at the composite level.

It is important to mention that, in our fundamental analysis of the cash-flow channel, we focused on profitability-related variables—that is, net margins, ROE, and interest coverage—that potentially support the academic argument that ESG characteristics may have a positive impact on distance to default because they are financial measures that typically enter standard credit-rating models. Therefore, we haven't controlled for credit quality in this analysis, because controlling for credit quality would lead to a circular regression. In summary, good ESG characteristics were associated with financial properties such as better interest coverage ratio, better ROE, and better profit margins, all of which support better credit ratings.

Systematic-Risk Channel

We now assess the systematic-risk channel for each of the USD and EUR IG and HY individual universes as well as for the composite universe (restricted to issuers with available ESG scores), for the sample period from January 2014–June 2020. All risk and factor calculations were performed using a cross-sectional regression model detailed in the online appendix.

Valuation Channel

In this section, we will test the systematic risk channel and its potential impact on valuations for corporate bonds along the following hypothesis:

We will empirically validate each step in the chain:

Step 1: Lower systematic risk. We use the systematic volatility as a measure for systematic risk. Exhibit 10 compares the average systematic volatility of ESG-rating-score terciles across universes. We found that issuers with high ESG ratings (Tercile 3) had less systematic volatility than those with low ESG ratings (Tercile 1), and the impact was more pronounced in HY compared with IG in the respective currency market. Overall, this result is in line with the hypothesis that companies with high ESG exposure have lower systematic risk.

To analyze the impact on the maturity dimension, in Exhibit 11 we plot the systematic risk spread between the highest- and lowest-ESG-rated issuers, across the two time-to-maturity buckets: short (less than five years to maturity) and long (more than five years to maturity). We observed a stronger risk reduction at the longer end of the maturity segment in both the USD and EUR IG universes as well as in USD HY. However, in the EUR HY universe we observed higher risk reduction at the shorter end of the spectrum, but the difference was statistically insignificant (even at 90% confidence level).

Step 2: Lower cost of capital. In the corporate-bond space, cost of debt capital can be measured as the average credit spread of an issuer's outstanding bonds,

EXHIBIT 10

Systematic Volatility of ESG Terciles

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 < T1	(T3 – T1) < 0
Universe	Mean (%)	Mean (%)	Mean (%)	25th %ile (%)	75th %ile (%)	% of Sample	p-Value
Composite	4.04	1.72	–2.32	–2.56	–1.47	100.0	0.000***
USD IG	2.49	1.78	–0.71	–0.89	–0.37	100.0	0.000***
USD HY	5.11	3.72	–1.39	–1.48	–0.77	100.0	0.000***
EUR IG	1.33	1.12	–0.21	–0.25	–0.06	100.0	0.000***
EUR HY	4.00	3.53	–0.48	–1.07	0.16	67.9	0.000***

NOTES: This exhibit shows the equal-weighted annualized systematic risk (from the cross-sectional regression model detailed in the online appendix) of the of the lowest (T1) and highest (T3) ESG-score terciles from January 2014–June 2020 (78 month-end samples). The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. *** indicates significance at the 99% confidence level.

EXHIBIT 11

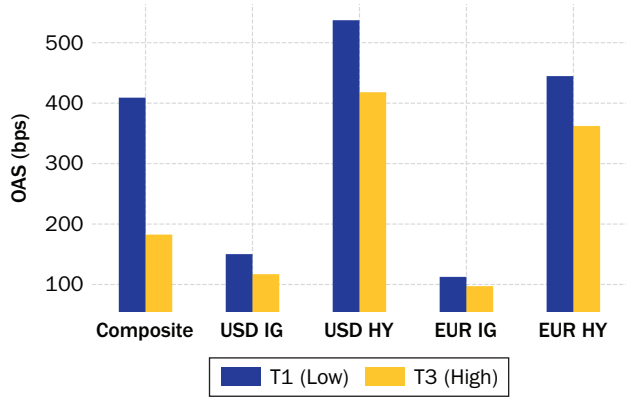
Systematic-Volatility Spread of ESG Terciles across Maturities

	<5Y TTM (short)	>5Y TTM (long)	Long – Short			Long < Short	(Long-Short) < 0
Universe	Mean (%)	Mean (%)	Mean (%)	25th %ile (%)	75th %ile (%)	% of Sample	p-Value
Composite	–0.66	–0.94	–0.28	–0.43	0.04	71.8	0.000***
USD IG	–0.07	–0.76	–0.69	–1.14	–0.21	94.9	0.000***
USD HY	–1.33	–1.54	–0.21	–0.70	0.32	59.0	0.008***
EUR IG	–0.14	–0.28	–0.14	–0.19	–0.05	80.8	0.000***
EUR HY	–0.66	–0.36	0.28	–0.56	0.85	42.9	0.887

NOTES: This exhibit shows the equal-weighted systematic-risk spread between the highest (T3) and lowest (T1) ESG-score terciles, (T3 – T1), across the two time-to-maturity (TTM) buckets—short (<5 years to maturity) and long (>5 years to maturity)—from January 2014–June 2020 (78 month-end samples). Systematic risk is calculated from a cross-sectional regression model as detailed in the online appendix. The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. ***indicates significance at the 99% confidence level.

EXHIBIT 12

Average Issuer-Specific Credit Spreads of ESG Terciles



NOTE: This exhibit shows the mean of the month-end equal-weighted average OAS of the highest (T3) and lowest (T1) ESG-score terciles from January 2014–June 2020.

which we used in Exhibit 12 to compare the cost of debt capital of high- versus low-ESG-rated terciles. For all universes, we observed that the lowest-ESG-rated companies had higher average credit spreads.

Do Credit Ratings Fully Reflect ESG Risks in the Cost of Capital?

To assess whether credit ratings fully reflect ESG risks in the cost of capital, we measured the carry exposure of the lower and upper ESG terciles, where the carry exposure reflects differences in the OAS intra-credit-rating buckets (Exhibit 13). We found that after adjusting for credit quality, the higher-ESG-rated issuers still had lower spreads compared to the lower-ESG-rated issuers, suggesting that ESG risks may not have been fully reflected in credit ratings.

EXHIBIT 13

Average Active Carry Exposure of ESG Terciles

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 < T1	(T3 – T1) < 0
Universe	Mean	Mean	Mean	25th %ile	75th %ile	% of Sample	p-Value
Composite	0.14	–0.14	–0.28	–0.34	–0.19	100.0	0.000***
USD IG	0.10	–0.09	–0.20	–0.23	–0.16	100.0	0.000***
USD HY	0.09	–0.09	–0.18	–0.22	–0.14	98.7	0.000***
EUR IG	0.12	–0.11	–0.23	–0.29	–0.16	98.7	0.000***
EUR HY	0.11	–0.08	–0.19	–0.32	0.00	74.4	0.000***

NOTES: This exhibit shows the equal-weighted average carry exposures relative to their respective analysis universes from January 2014–June 2020 (78 month-end samples). Carry exposure for an issuer is defined as log OAS standardized within the same credit-rating peer universe. The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. *** indicates significance at the 99% confidence level.

EXHIBIT 14

Average Active Value Exposure of ESG Terciles

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 < T1	(T3 – T1) < 0
Universe	Mean	Mean	Mean	25th %ile	75th %ile	% of Sample	p-Value
Composite	0.04	–0.03	–0.08	–0.12	–0.04	91.0	0.000***
USD IG	0.05	–0.03	–0.07	–0.17	0.01	70.5	0.000***
USD HY	0.05	–0.04	–0.09	–0.14	–0.05	84.6	0.000***
EUR IG	0.05	–0.06	–0.11	–0.16	–0.05	88.5	0.000***
EUR HY	0.04	–0.01	–0.05	–0.18	0.08	56.4	0.015**

NOTES: This exhibit shows the equal-weighted average sector-neutral value exposures of the lowest (T1) and highest (T3) ESG-score terciles, relative to their respective analysis universes, from January 2014–June 2020 (78 month-end samples). Value exposure is defined as the OLS residual obtained when regressing the OAS on size, credit rating, and duration. Refer to the online appendix for details. The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. *** and ** indicate significance at the 99% and 95% confidence levels, respectively.

Step 3: Higher valuation. Ultimately, we expect lower costs of capital to result in higher valuations for the debt, given a lower discount factor. Exhibit 14 plots the average sector-neutral value exposures of ESG terciles, relative to their respective universes. The higher value exposure for an issuer means that the issuer is relatively cheaper compared with its intrinsic value (see Exhibit A2 in the online appendix for the complete analysis of the value factor). Exhibit 14 shows that higher ESG ratings (T3) coincided with lower value exposures—that is, they have higher valuations in terms of market spread (OAS) being wider than the fair-value spread.

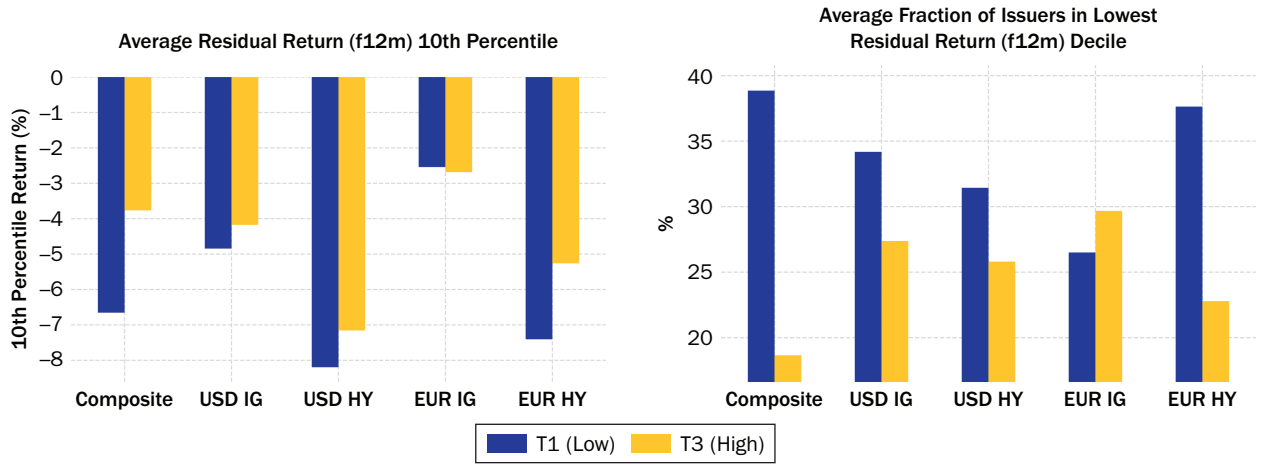
Overall, in our analysis we found that the higher-ESG-rated corporate bonds had lower systematic risk, lower spreads (within credit ratings), and therefore higher valuations.

Idiosyncratic-Risk Channel

The last issuer-specific transmission channel relates how well high-ESG-rated companies manage their business and operational risks beyond what is explained by credit ratings. Their bond prices (excess returns) typically have shown lower idiosyncratic tail risk, as outlined as follows:

EXHIBIT 15

Value-at-Risk and Percentage of Issuers in the Tail by ESG Profile



NOTES: The mean tail return is calculated as the 10th percentile of forward 12-month residual returns, and the likelihood of tail event is calculated as the fraction of issuers in the lowest decile of forward 12-month residual returns, for the lowest (T1) and highest (T3) ESG-score terciles, for each of the respective analysis universes, from January 2014–June 2020. Residual returns are returns from the cross-sectional regression model that are left unexplained by all model factors (including the credit-quality factor), as detailed in the online appendix.

Once again, we would like to empirically verify these three steps in the transmission channel.

Step 1: Better risk management. To what extent high-ESG-rated issuers have better risk management is not directly observable in the market. However, the assessment of companies' risk management capabilities with respect to potential financially relevant risks is the core principle of the MSCI ESG Ratings model. We use steps 2 and 3 of the transmission channel to validate the extent to which the ESG rating has been successful at identifying idiosyncratic risks.

Step 2: Lower likelihood of severe incidents. To assess the ability of issuers' risk management functions to successfully mitigate severe incidents that can lead to a deterioration in credit quality, we first looked at the magnitude of large, adverse residual excess returns. More precisely, we measured the value-at-risk of 12-month forward residual returns at the 10% level of each ESG-rating tercile in the respective universe (see Exhibit 15's left plot). On average, issuers in the lower ESG tercile had a higher value-at-risk than issuers in the upper tercile across each universe.

Second, we measured the percentage of issuers, in the bottom decile of forward 12-month residual returns, that fell in each ESG-rating tercile. We found that, across each universe and with the exception of EUR IG, the percentage of issuers below the lowest-residual-return decile was most often found in the lower-ESG-rating tercile (see Exhibit 15's right plot).

Step 3: Lower idiosyncratic risks. To illustrate how ESG characteristics are linked to idiosyncratic risks, Exhibit 16 compares the average residual volatility of issuers in the top and bottom ESG terciles for each market. We find lower levels of idiosyncratic risk for high-ESG-rated issuers compared to lower-ESG-rated issuers in the HY universe, while there are muted differences in IG. The muted difference between

EXHIBIT 16

Idiosyncratic Risk of ESG-Score Terciles

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 < T1	(T3 – T1) < 0
Universe	Mean (%)	Mean (%)	Mean (%)	25th %ile (%)	75th %ile (%)	% of Sample	p-Value
Composite	0.35	0.17	–0.18	–0.20	–0.11	100.0	0.000***
USD IG	0.25	0.23	–0.02	–0.03	0.02	59.0	0.001***
USD HY	0.60	0.51	–0.09	–0.16	–0.02	84.6	0.000***
EUR IG	0.12	0.10	–0.02	–0.03	0.01	55.1	0.000***
EUR HY	1.20	0.93	–0.26	–0.60	0.14	66.7	0.001***

NOTES: This exhibit shows the equal-weighted annualized idiosyncratic risk (from the cross-sectional regression model detailed in the online appendix) for the lowest (T1) and highest (T3) ESG-score terciles for each universe from January 2014–June 2020 (78 month-end samples). The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero.
***indicates significance at the 99% confidence level.

tercile 1 and tercile 3 within IG could partly stem from the lower levels of idiosyncratic risks in general.

Did ESG Identify Tail Risks Not Fully Captured by Credit Ratings?

We observed that companies with good ESG characteristics showed a lower likelihood of suffering from issuer-specific risks than companies with low ESG ratings, after accounting for common factors including credit ratings. Therefore, this provides evidence for ESG ratings to add a degree of information that can potentially help investors to manage or mitigate risks in their bond portfolios.

Effectiveness of ESG across Issuer Universes

To sum up, the first transmission channel explained how ESG characteristics are associated with financial variables that typically directly enter credit-risk analysis. It also showed why ESG ratings may be used within traditional credit-risk analysis. The second and third channels accounted for credit-related factors, thus presenting evidence that ESG characteristics provide additional explanatory power for credit risk, even for investors who already use credit ratings. Finally, we showed that the impact of ESG on systematic risk varies between: (1) IG and HY bonds and (2) shorter- and longer-dated maturities in a nonlinear manner.

PERFORMANCE OF ESG IN CORPORATE BONDS

The analysis of the transmission channels in the previous sections illustrated the relationships between companies' ESG characteristics and their fundamental risk characteristics. The logical question is how far these fundamental differences may have influenced the actual performance of bonds after accounting for common factor returns.

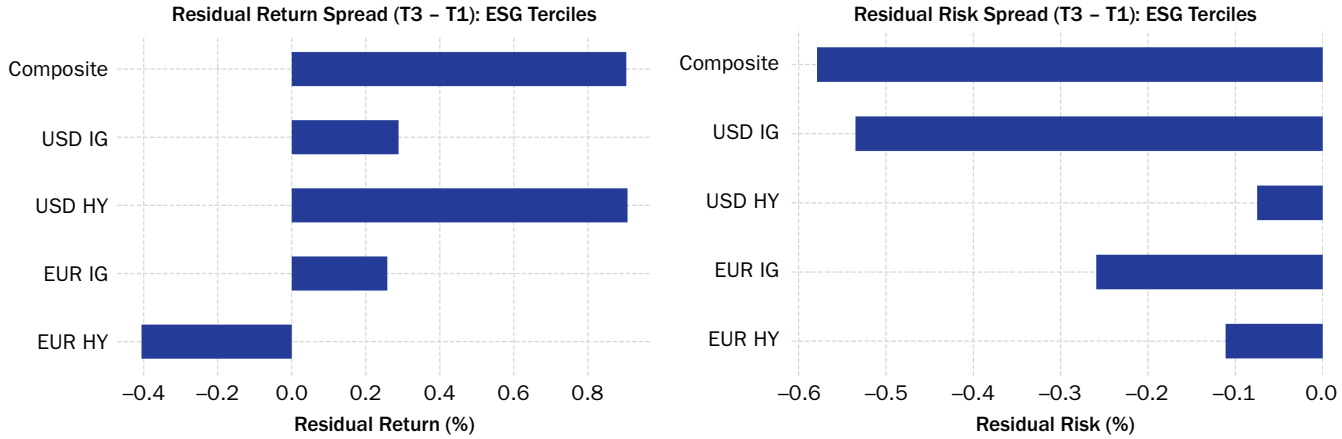
Did ESG Add Value over Traditional Credit Factors?

We evaluate the risk and return of industry-adjusted ESG-score terciles by considering the subsequent month's performance of the terciles computed at the end of each month, over the sample period from January 2014–July 2020. We recognize that

EXHIBIT 17

Residual-Return Spread and Residual-Risk Spread of ESG Terciles

Panel A: Average Residual-Return and Residual-Risk Spread



Panel B: Residual Return Statistics Table

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 > T1 % of Sample	(T3 – T1) > 0 p-Value
Universe	**Mean (%)**	**Mean (%)**	**Mean (%)**	**25th %ile (%)**	**75th %ile (%)**		
Composite	–1.82	–0.92	0.90	–0.75	2.27	64.1	0.032**
USD IG	–1.68	–1.39	0.29	–0.48	0.89	62.8	0.159
USD HY	–1.84	–0.93	0.91	–1.80	2.43	57.7	0.165
EUR IG	–0.96	–0.70	0.26	–0.43	0.42	51.3	0.068*
EUR HY	–1.14	–1.55	–0.41	–3.73	3.41	47.4	0.706

NOTES: This exhibit shows the equal-weighted residual-return and residual-risk spread between the highest (T3) and lowest (T1) ESG-score terciles from January 2014–July 2020 (78 month-end samples). Residual returns are returns from the cross-sectional regression model that are left unexplained by all of the model factors (including the credit quality factor), as detailed in the online appendix. The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. * and ** indicate significance at the 99% confidence levels, respectively.

excess returns may include returns stemming from a credit-rating bias and perhaps other factor biases inherent in ESG portfolios. Therefore, we show only high-level performance results for residual returns. The residual returns are simply excess returns minus common factor returns from the credit model (see the online appendix).

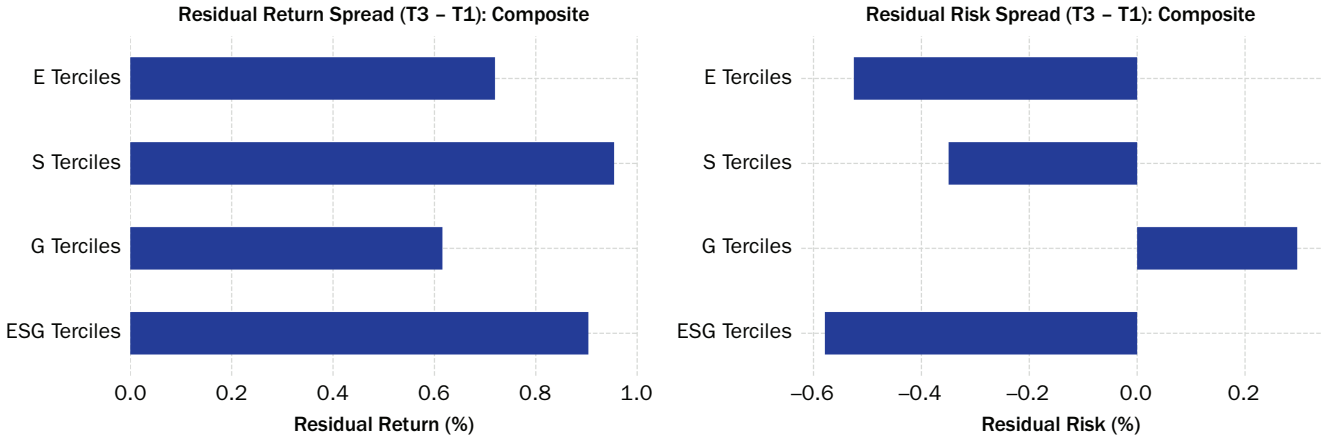
Exhibit 17 plots the residual return and risk spread (T3 – T1) for each universe. This gives us more transparency on the impact of ESG ratings after accounting for common style factors, such as credit ratings. We found that the upper-ESG-rating tercile outperformed the lower tercile in each universe, except for EUR HY. The outperformance was statistically significant for the Composite and EUR IG universes, while for other universes it was statistically inconclusive. In terms of risk, the upper-ESG-rating tercile realized lower volatility than the lower tercile across all universes, and this risk reduction was more pronounced among USD IG bonds. The online appendix shows the detailed residual performance statistics across universes and across the ESG terciles.

Similarly, Exhibit 18 shows the residual-return and residual-risk performance of the highest (T3) tercile relative to the lowest tercile (T1) across the three individual pillars and ESG-score terciles for the composite universe. We found that the aggregate ESG-rating score showed a marginally lower risk spread than the three individual pillar scores, which again emphasized the value added by the combined ESG score even

EXHIBIT 18

Residual-Return Spread and Residual-Risk Spread of E, S, G and ESG Terciles

Panel A: Average Residual-Return and Residual-Risk Spread for Composite Universe



Panel B: Residual Returns Statistics Table for Composite Universe

	Low ESG Tercile (T1)	High ESG Tercile (T3)	T3 – T1			T3 > T1 % of Sample	(T3 – T1) > 0 p-Value
Tercile	Mean (%)	Mean (%)	Mean (%)	25th %ile (%)	75th %ile (%)		
E Terciles	–1.75	–1.03	0.72	–0.84	2.44	61.5	0.033**
S Terciles	–1.82	–0.87	0.95	–0.79	2.16	61.5	0.006***
G Terciles	–1.72	–1.11	0.62	–1.31	2.37	59.0	0.048**
ESG Terciles	–1.82	–0.92	0.90	–0.75	2.27	64.1	0.032**

NOTES: This exhibit shows the equal-weighted residual return and risk spread between the highest- (T3) and lowest-rated (T1) E-, S- and G-pillar scores and industry-adjusted ESG-score terciles for the composite universe from January 2014–July 2020 (78 month-end samples). Residual returns are returns from the cross-sectional regression model that are left unexplained by all the model factors (including the credit quality factor), as detailed in the online appendix. The p-value of a one-sided test for the null hypothesis shows that the difference is equal to zero. ** and *** indicate significance at the 99% confidence levels, respectively.

after adjusting for common factors such as credit ratings. We also note that the G pillar showed the weakest results after adjusting for all the common factors, which could be because governance-related risks were better understood by market participants and may therefore have been priced in by the market (through some common factor)—in contrast to social and environmental risks, which may be relatively less exposed by traditional credit analysis.

Overall, we found that MSCI ESG Ratings provided additional information relevant to the identification of risk that had not been fully captured in credit ratings.

CONCLUSION

We analyzed the effectiveness of three transmission channels (the cash flow channel, systematic-risk channel, and idiosyncratic-risk channel) in developed-market corporate bonds (USD and EUR and IG and HY). Based on a conceptual analysis using the Merton credit-risk model, we expected these transmission channels to be potentially most effective in terms of downside risk reduction and to show more financially significant results in HY than in IG. Across all the empirical tests conducted in this article, these two economic arguments were in line with the empirical results.

Our analysis of the cash flow channel showed that high-ESG-rated issuers showed statistically stronger financials than low-rated issuers, which ultimately led to better credit quality. The analysis of risks showed that high-ESG-rated issuers showed statistically lower levels of systematic and idiosyncratic risks after controlling for traditional DTS factors and style factors, including credit quality. The reduction in risks was higher in HY than in IG; and within IG, the systematic risk reduction was greater among longer-dated bonds than shorter-dated bonds. Our performance analysis showed that investing in high-ESG-rated issuers did not result in underperformance. In fact, the risk-adjusted returns were slightly better than in the overall universe.

All in all, in our analysis, we found that ESG-related risks were not fully captured in credit ratings, which means ESG ratings provided extra information to investors. We also observed that the aggregate MSCI ESG Ratings showed stronger results in terms of reducing risks than the individual pillars, which means that aggregating E, S, and G risk into a combined ESG rating added financial value.

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