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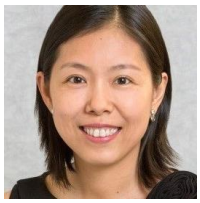
The Financial Materiality of Sustainability Risk in Credit Markets

A Decade of Evidence

Authors



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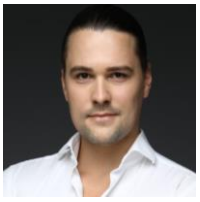

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Executive summary

Understanding whether sustainability risk can materially affect risk-adjusted returns — beyond what can be explained by traditional financial metrics — is critical for investors to account for all the relevant risk and return drivers in their investment process. This relationship has been widely researched, including in meta-studies such as Friede, Busch and Bassen (2015) and Atz et al. (2022).

This paper provides a refreshed and expanded analysis of the foundational study by Mendiratta, Varsani and Giese (2021) on sustainability risk in corporate credit by extending the analysis through 2024 and introducing methodological changes to enhance insights into the financial materiality of sustainability risks and opportunities.

We evaluate a decade of data (from January 2015 to December 2024) to reassess whether sustainability characteristics offered additional explanatory power for credit risk and performance — especially after controlling for traditional factors such as duration, credit quality and liquidity. We enhanced the original analysis by employing two key methodology changes: 1) a robust regression-based approach to control for other risk-premia drivers when answering the question, "Did sustainability data add value over traditional credit factors?" and 2) a performance-attribution framework leveraging the MSCI Multi-Asset Class (MAC) Factor Model to account for traditional fixed-income factors.

In addition to confirming the key findings in the original paper from Mendiratta, Varsani and Giese (2021), our enhanced methodology provided stronger evidence of the value of incorporating sustainability information for risk mitigation and enhanced risk-adjusted returns.

Key takeaways

- Sustainability risk remained financially material across credit markets over our 10-year study period spanning several macro regimes. It was more pronounced with high-yield and longer-dated bonds.
- We validated the thesis of the three economic transmission channels — cash flow, systematic risk and idiosyncratic risk — through which sustainability risks and opportunities may affect performance in credit markets.
- Through a cross-sectional regression to control for differences in credit quality, duration and liquidity, we identified a sustainability component of risk premia not explained by traditional credit-risk factors.
- Using the MSCI MAC Factor Model allowed us to disentangle fixed-income risk and return drivers and confirm that higher-ESG-rated bonds carried lower systematic and idiosyncratic risk.
- High-ESG-rated issuers exhibited significantly lower residual risk compared to low-rated ones after adjusting for credit quality, though incremental returns were not significant and marginally negative. The environmental pillar exhibited the strongest risk reduction, followed by the aggregate MSCI ESG Rating.
- Beyond potentially enhancing risk-adjusted returns, these findings may prove useful in investment and risk-management processes, such as asset allocation and security selection, and in setting risk limits and portfolio monitoring.

Data and methodology

This study provides a refreshed and expanded analysis of the role of an issuer's sustainability profile in corporate credit risk and performance, covering the study period from January 2015 to December 2024 (10 years of monthly data). We constructed the analysis using MSCI ESG Ratings, MSCI fixed-income indexes, the MSCI MAC Factor Model and performance attribution and corporate fundamental data. The analysis spans four broad corporate-bond universes: the MSCI USD Investment Grade (IG) Corporate Bond Index, MSCI USD High Yield (HY) Corporate Bond Index, MSCI EUR IG Corporate Bond Index and MSCI EUR HY Corporate Bond Index. For consistency, we included only bonds of issuers with complete MSCI ESG Ratings coverage, resulting in the full analysis universe with 20,164 bonds from 1,937 unique issuers. While we always started from the full dataset, individual analyses were subject to data availability, so the sample sizes used in the different sections of the paper varied.

Statistics across ESG Rating terciles and the composite bond universe

ESG tercile	No. of bonds	No. of issuers	ESG score	OAS (bps)	Effective duration	Spread duration
T1 (low)	2,244	403	3.8	180	5.8	5.8
T2	2,244	403	6.0	171	5.5	5.5
T3 (high)	2,246	403	8.0	161	5.4	5.4
Composite universe	6,734	1,210	5.9	171	5.6	5.6

This table shows the average values from January 2015 to December 2024. The number of bonds and issuers shows the monthly average sample size throughout the study period (restricted to issuers with available MSCI ESG Ratings). The terciles were created using the industry-adjusted score (IAS) that underlies the MSCI ESG Rating. Source: MSCI ESG Research

We employed several methodological enhancements compared to the study published in 2021. First, a 5% winsorization was applied to all key metrics to limit the influence of outliers. Second, we implemented a robust regression framework to isolate the incremental effect of ESG scores on credit spreads and returns, controlling for traditional risk factors including credit, duration and liquidity.

Finally, we carried out performance attribution using the MSCI MAC Factor Model to analyze the contribution of MSCI ESG Ratings to residual return and risk beyond conventional risk premia.

Sustainability risk and traditional corporate-bond metrics

MSCI ESG Ratings are designed to assess companies' exposure to and management of sustainability risks that may affect their business performance and valuation. These risks include, among others, utilization of natural resources, capturing technological opportunities, maximizing workforce productivity and managing conflicts of interest among different stakeholders. So, how is sustainability risk priced in the market? Does incorporating MSCI ESG Ratings add to traditional credit analysis? Can they provide additional insights beyond credit ratings? These are some of the questions we address in this section.

Pricing of sustainability risk in credit markets

Credit spreads reflect the market price of credit risk, capturing the probability of default, loss given default and other characteristics such as liquidity or considerations like risk aversion.

Typically, bonds with lower credit quality (measured by credit ratings) have wider credit spreads. But how were the differences in issuers' sustainability profile (measured by MSCI ESG Ratings) priced in the credit spreads? Merton (1974) showed that the Black–Scholes option-pricing theory may be used to estimate a firm's probability of default and determine credit spreads. If sustainability plays a role in the firm's risk profile, within the Merton model, we'd expect to see a similar inverse relationship between MSCI ESG Ratings and credit spreads.

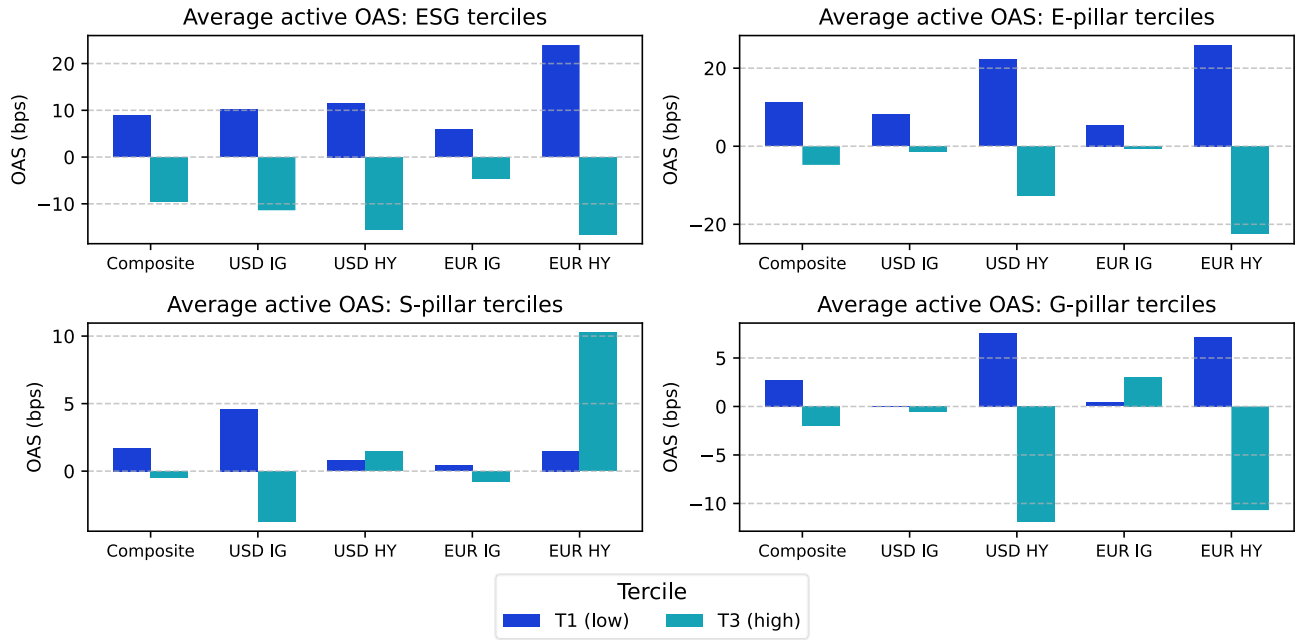
We'd also expect this relationship to be a nonlinear function of credit quality and maturity (i.e., probability of default) and therefore to be more pronounced in HY than in IG bonds, and with longer-dated bonds than with shorter-dated ones, as cumulative credit risk tends to increase with time horizon.

To validate these assumptions, we first looked at the average option-adjusted spread (OAS) of the lowest- and highest-ESG-rating terciles (T1 and T3, respectively) across different bond universes and maturities. We did the same with terciles based on the environmental-, social- and governance-pillar scores.[1]

As the charts below show, bonds from high-ESG-rated issuers had, on average, lower OAS, and the differential was indeed more pronounced in the HY compared to the IG universe (at the composite level and for most sub-universes, the results held also when looking at the individual E, S and G pillars separately). The overall MSCI ESG Rating, however, showed itself to be a better differentiator in credit risk than the individual pillars scores — consistent with results in our earlier study.

[1] Terciles were created within the respective bond universes to mitigate the impact of currency and credit quality on the results.

Active OAS by ESG-rating tercile



The exhibit shows the average active OAS (i.e., relative to the full-sample mean) per ESG-rating and individual E-, S- and G-pillar terciles covering the period from January 2015 to December 2024. Source: MSCI ESG Research

The table below shows that the difference in OAS between the high- and low-ESG-rating terciles, per unit of ESG-rating spread, was higher in HY than in IG in both USD and EUR for both absolute OAS measured in basis points (bps) and relative OAS measured in percentage (last two rows in the table). The exception was that USD IG showed higher sensitivity than USD HY to MSCI ESG Ratings, as expressed in % of OAS change per unit of ESG-rating difference, supporting our assumption that MSCI ESG Ratings should be a bigger differentiator in HY (which is more driven by issuer risk) than in IG (more driven by macro risk).[2]

[2] This dynamic only did not hold with the relative OAS spread (tercile 3 – tercile 1 / universe) for USD IG and HY, where USD IG showed higher sensitivity to MSCI ESG Ratings (expressed in % of OAS change per unit of ESG-rating difference).

Average ESG score and OAS spread between high- and low-ESG-rating terciles

ESG tercile	Composite universe	USD IG	USD HY	EUR IG	EUR HY
(1) ESG score spread	4.23	4.16	4.48	4.07	4.98
(2) ESG score spread (p-val)	0.000***	0.000***	0.000***	0.000***	0.000***
(3) OAS spread (bps)	-18.23	-21.63	-26.95	-10.43	-40.21
(4) OAS Spread (p-val)	0.000***	0.000***	0.000***	0.000***	0.000***
(5) OAS relative spread (%)	-10.63	-19.53	-8.01	-8.86	-12.60
(6) Spread-duration spread	-0.39	-0.88	0.05	-0.11	-0.06
(7) Spread-duration spread (p-val)	0.000***	0.000***	1.000	0.000***	0.003***
Ratio |(3)/(1)|	4.31	5.20	6.02	2.56	8.07
Ratio |(5)/(1)|	2.51	4.69	1.79	2.18	2.53

The exhibit shows the average of equal-weighted monthly data from January 2015 to December 2024. (1), (3) and (6) are average spreads calculated as [T3 (high) – T1 (low)]; (5) is the average relative spread calculated as [T3 (high) – T1 (low)]/ Universe; (2), (4) and (7) are p-values of a one-sided test for the null hypothesis that the difference is equal to zero. ***, **, and * indicate significance at the 99%, 95%, and 90% confidence levels, respectively. Source: MSCI ESG Research

Likewise, we mostly saw a larger spread differential between the ESG-rating terciles with longer-dated bonds in the IG space but not in the HY space — also consistent with the prior results (as shown in the table below).

Average ESG-rating and OAS spread across time-to-maturity buckets

	USD IG		USD HY		EUR IG		EUR HY	
	Long	Short	Long	Short	Long	Short	Long	Short
1) ESG-score spread	4.10	4.20	4.36	4.57	4.09	4.04	4.91	4.93
2) OAS spread (bps)	-21.37	-10.24	-19.52	-40.16	-11.72	-8.35	-39.45	-44.90
3) Spread-duration spread	-0.48	-0.06	-0.22	0.01	-0.30	0.05	-0.38	0.01
Ratio |(2)/(1)|	5.21	2.44	4.48	8.79	2.86	2.07	8.04	9.10

This exhibit shows the mean of month-end equal-weighted averages from January 2015 to December 2024. (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. Source: MSCI ESG Research

Put together, the above results validated our understanding of credit risk, part of which may be driven by sustainability issues, to be a nonlinear function of credit quality and time to maturity.

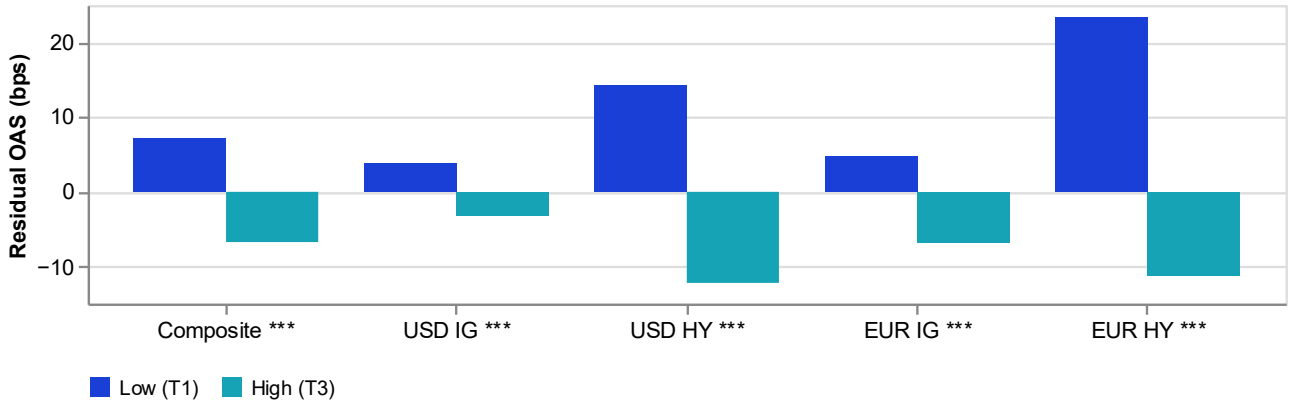
Residual OAS after controlling for traditional credit-spread drivers

To rigorously evaluate whether resilience in the face of sustainability risks (measured by MSCI ESG Ratings) provided incremental explanatory power, we employed a robust regression-based analysis. Specifically, we regressed OAS on traditional credit-spread drivers — duration, credit quality and liquidity

— to isolate the residual spreads attributable to ESG-rating exposure.[3] This approach allowed us to assess whether MSCI ESG Ratings captured relevant information not already explained by conventional credit characteristics.

As the chart and table below show, bonds from issuers with high MSCI ESG Ratings (T3) had consistently lower residual OAS compared to their respective bond universe and to those with low MSCI ESG Ratings (T1). These findings indicate that higher-ESG-rated bonds benefited from lower spreads even after removing the influence of other bond characteristics that tend to drive credit spreads. The magnitude of the residual spread differentials was particularly pronounced in the HY market segments, underlining the potentially greater differentiating power of MSCI ESG Ratings in higher-risk environments.

Average residual OAS by ESG-rating tercile



	Lowest-ESG tercile (T1)	Highest-ESG tercile (T3)	T3 (high) - T1 (low)			T3 (high) > T1 (low)	
	Mean	Mean	Mean	25th percentile	75th percentile	% of sample	p-value
Composite universe	7.23	-6.73	14.61	11.28	18.26	99.2	0.000***
USD IG	3.88	-3.16	8.92	0.98	13.69	75.8	0.000***
USD HY	14.21	-12.20	24.97	15.17	34.67	96.7	0.000***
EUR IG	4.70	-6.77	12.59	5.68	18.41	95.0	0.000***
EUR HY	23.38	-11.23	34.79	21.73	48.30	99.2	0.000***

The chart and table show the average residual OAS for the lowest- and highest-ESG-rating terciles relative to their respective analysis universe, from January 2015 to December 2024 (monthly data). The residual OAS is calculated from cross-sectional regression of the bond's OAS on bond-level credit quality, duration and liquidity. The p-value reflects a

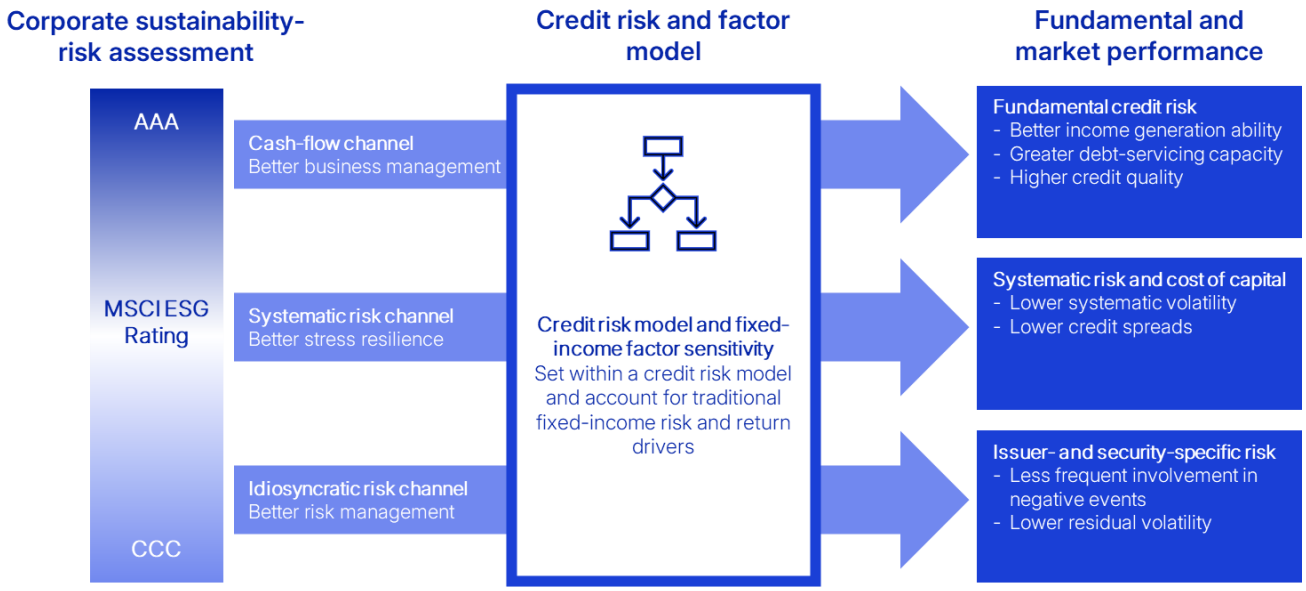
[3] Credit quality was defined based on S&P credit ratings of the respective bonds, duration was measured using Macaulay duration and liquidity was approximated by the 30-day average bid-ask spread.

one-sided test of the null hypothesis that the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

Economic transmission channels

As the next step, we dove into validating the transmission-channel framework, originally proposed by Giese et al. (2019) and adapted to the credit context by Mendiratta, Varsani and Giese (2021), to explain how resilience to sustainability risks and taking advantage of related opportunities, which MSCI ESG Ratings are designed to measure, may influence corporate issuers' credit profile and consequently market risk and return of their bonds.

Credit adaptation of the transmission-channel framework



The chart illustrates the hypothetical relationship between the information contained in MSCI ESG Ratings (left) and corporate issuers' credit profiles and the market risk of their bonds (right). Accounting for fixed-income-factor sensitivities (middle) may help isolate the residual effect of this information and help explain the strength of the relationship. Source: MSCI ESG Research

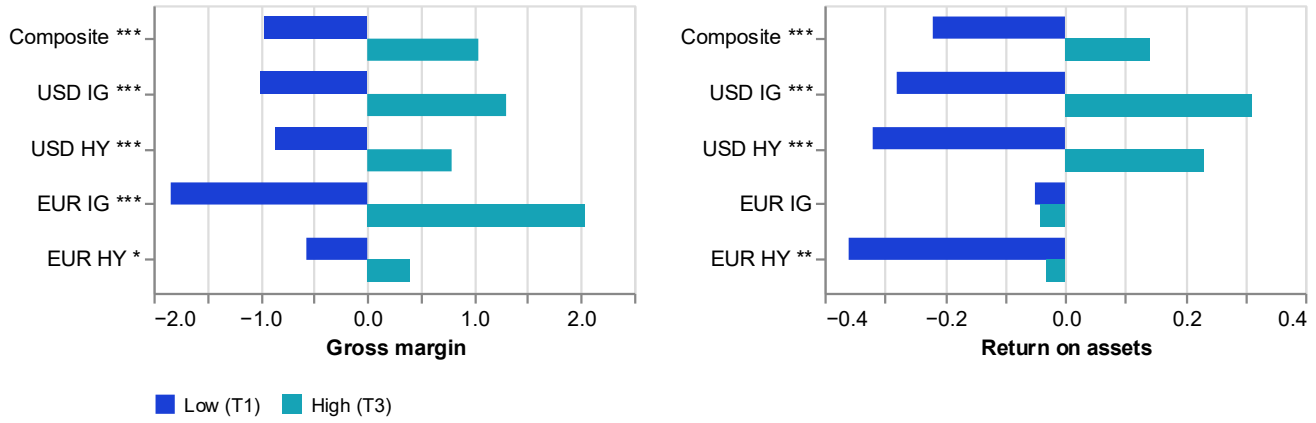
Cash-flow channel

In a recent study testing the cash-flow channel in equities, Giese and Shah (2024) showed that high-ESG-rated companies showed better returns on equity (ROE), and higher and more stable earnings compared to low-ESG-rated companies. In this section, we tested the cash-flow transmission channel in the context of credit analysis, with the following hypothesis:

Were issuers with high MSCI ESG Ratings more competitive (better at revenue generation) and more profitable? We used gross margin as the indicator of competitiveness. As Vance (2021) argues, gross margin can be a good predictor of the company's overall financial success. As the chart and table below show, on a sector-neutral basis (i.e., ranked within sectors), **issuers with high MSCI ESG Ratings exhibited higher gross margins across the board**.[4] Similarly, using return on assets (ROA) as the indicator of profitability (how much profit they can generate on their asset base), the **high-ESG-rated issuers showed significantly higher profitability in all universes except EUR IG**. The bar charts provide a visual representation of the detailed results shown in the table below (positive numbers indicate better performance vs. the respective universe).

[4] Issuers were ranked and grouped into terciles within their respective Global Industry Classification Standard (GICS®) sectors. GICS is the industry-classification standard jointly developed by MSCI and S&P Dow Jones Indices.

Competitiveness and profitability by ESG-rating tercile



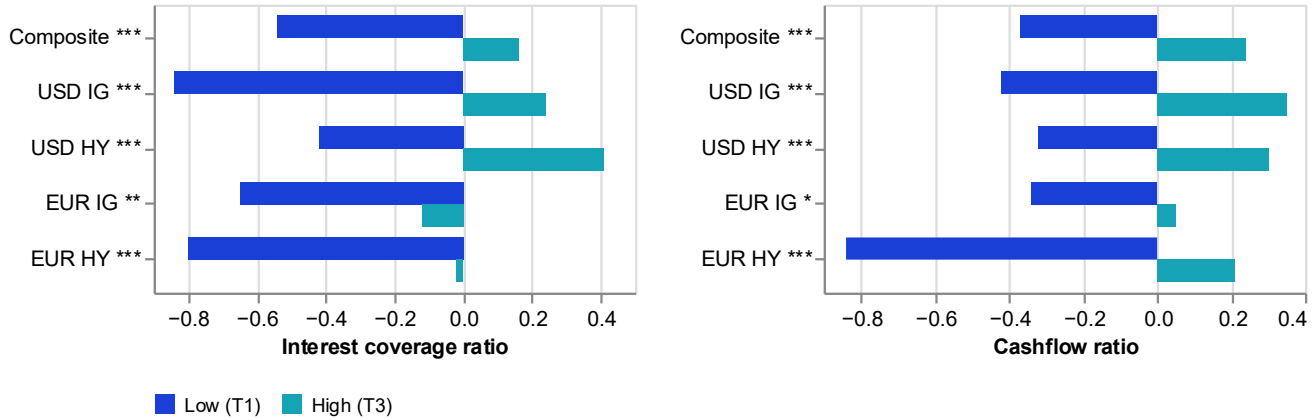
	Low-ESG tercile (T1)	High-ESG tercile (T3)	T3 (high) - T1 (low)			T3 (high) > T1 (low)	
	Mean (active)	Mean (active)	Mean	25th percentile	75th percentile	% of sample	p-value
Gross margin							
Composite universe	-0.96	1.04	2.01	1.42	2.60	96.6	0.000***
USD IG	-1.00	1.30	2.35	1.75	3.13	93.1	0.000***
USD HY	-0.86	0.79	1.63	0.40	2.96	79.3	0.000***
EUR IG	-1.84	2.04	3.98	1.92	5.42	93.1	0.000***
EUR HY	-0.57	0.40	1.11	-1.17	3.79	58.6	0.054*
Return on assets							
Composite universe	-0.22	0.14	0.31	-0.19	0.7	69.0	0.010***
USD IG	-0.28	0.31	0.57	-0.17	1.33	69.0	0.001***
USD HY	-0.32	0.23	0.48	-0.17	1.05	62.1	0.003***
EUR IG	-0.05	-0.04	0.05	-0.82	1.02	44.8	0.405
EUR HY	-0.36	-0.03	0.36	-0.46	1.15	51.7	0.040**

The chart and table show the operating margin and return on assets differences between the lowest- and highest-ESG-rating terciles relative to their respective analysis universe, based on issuer-level fundamentals and excluding financial companies from 2015 to 2024 (quarter-end data). Values are shown in raw decimal format (e.g., 0.1=10%). The p-value reflects a one-sided test of the null hypothesis that the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

Did companies with high MSCI ESG Ratings have greater debt-servicing capacity? The next question in the cash-flow channel was whether the profitability of high-ESG-rated companies translated into greater debt-servicing capacity. We measured this with interest coverage (EBIT/interest expense) and cash-flow ratio (cash flow from operations/total debt), to measure whether the debt-servicing capacity was supported by recurring income from operations and not ad hoc sources. Furthermore, as Seritidou et al.

(2025) argue, a combination of traditional and cash-flow-based ratios may provide a better understanding of a company's financial stability. As the chart and table below show, within their own sectors, **high-ESG-rated issuers showed consistently greater debt-servicing capacity, supported by cash flows from operations, than low-rated issuers across all universes**. The bar charts provide a visual representation of the detailed results shown in the table below (positive numbers indicate better performance vs. the respective universe).

Debt-servicing capacity by ESG-rating tercile



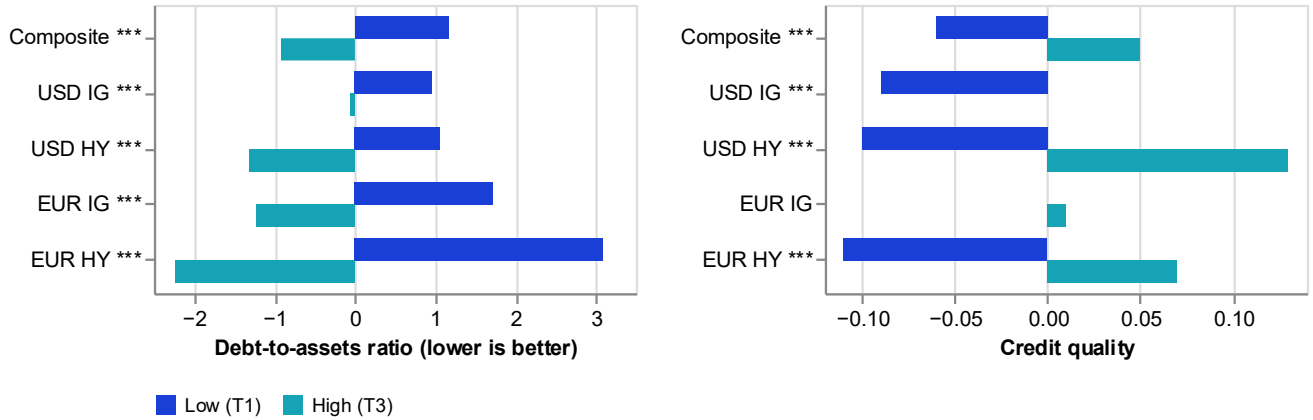
	Low-ESG tercile (T1)	High-ESG tercile (T3)	T3 (high) - T1 (low)			T3 (high) > T1 (low)	
	Mean (active)	Mean (active)	Mean	25th percentile	75th percentile	% of sample	p-value
Interest-coverage ratio							
Composite universe	-0.54	0.16	0.66	0.24	1.04	82.8	0.000***
USD IG	-0.84	0.24	1.13	0.45	1.69	82.8	0.000***
USD HY	-0.42	0.41	0.78	0.31	1.12	93.1	0.000***
EUR IG	-0.65	-0.12	0.61	-0.68	1.99	62.1	0.026**
EUR HY	-0.8	-0.02	0.78	0.08	1.56	79.3	0.001***
Cash-flow ratio							
Composite universe	-0.37	0.24	0.61	0.12	1.09	75.9	0.000***
USD IG	-0.42	0.35	0.83	0.29	1.62	75.9	0.000***
USD HY	-0.32	0.3	0.62	0.14	1.01	75.9	0.000***
EUR IG	-0.34	0.05	0.35	-0.63	1.41	58.6	0.078*
EUR HY	-0.84	0.21	0.95	0.36	1.72	75.9	0.002***

The chart and table show differences in the interest-coverage (EBIT / interest expense) and cash-flow ratios (cash flow from operations / total debt) between the lowest- and highest-ESG-rating terciles relative to their respective analysis universe, based on issuer-level fundamentals and excluding financial companies from 2015 to 2024 (quarter-end data). Values are shown in raw decimal format (e.g., 0.1=10%). The p-value reflects a one-sided test of the null hypothesis that

the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

Finally, did the economic arguments of better competitiveness, higher profitability and greater debt-servicing capacity observed for the high-ESG-rated companies lead to an increased distance to default in line with the Merton model's framework? We approximated this relationship by looking at debt-to-assets ratio (all else equal, lower ratio means greater distance to default) and ultimately by looking at the issuers' credit quality (through issuer-level credit ratings) as the aggregated measure of likelihood of default. As the chart and table below show, **issuers with high MSCI ESG Ratings exhibited lower debt-to-asset ratios and higher credit quality across the studied universes**. The bar charts provide a visual representation of the detailed results shown in the table below (for debt-to-assets ratio, negative numbers indicate better performance vs. the respective universe; for credit quality, positive numbers indicate better performance).

Debt-to-assets ratio and issuer credit quality by ESG-rating tercile



	Low-ESG tercile (T1)	High-ESG tercile (T3)	T3 (high) - T1 (low)			T3 (high) > T1 (low)	
	Mean (active)	Mean (active)	Mean	25th percentile	75th percentile	% of sample	p-value
Debt-to-assets ratio							
Composite universe	1.17	-0.92	2.09	1.65	2.49	100	0.000***
USD IG	0.96	-0.05	1.18	0.43	2.23	79.3	0.001***
USD HY	1.06	-1.31	2.32	0.91	3.38	100	0.000***
EUR IG	1.72	-1.23	2.94	2.38	3.73	96.6	0.000***
EUR HY	3.09	-2.23	5.54	3.55	7.55	96.6	0.000***
Credit quality							
Composite universe	-0.06	0.05	0.11	0.09	0.14	100	0.000***
USD IG	-0.09	0	0.1	0.03	0.17	82.8	0.000***
USD HY	-0.1	0.13	0.23	0.17	0.29	100	0.000***
EUR IG	0	0.01	0.02	-0.02	0.08	65.5	0.243
EUR HY	-0.11	0.07	0.18	0.07	0.34	93.1	0.000***

The chart and table show the differences in debt-to-assets ratio and credit quality between the lowest- and highest-ESG-rating terciles relative to their respective analysis universe, based on issuer-level fundamentals and excluding financial companies from 2015 to 2024 (quarter-end data). Debt-to-assets values are shown in raw decimal format (e.g., 0.1=10%). Credit quality is defined as the average of the numerical equivalents of the issuer-level credit ratings by S&P and Moody's. For each issuer, the ratings are averaged to derive a single credit-quality score. If only one rating was available, that rating was used. The p-value reflects a one-sided test of the null hypothesis that the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

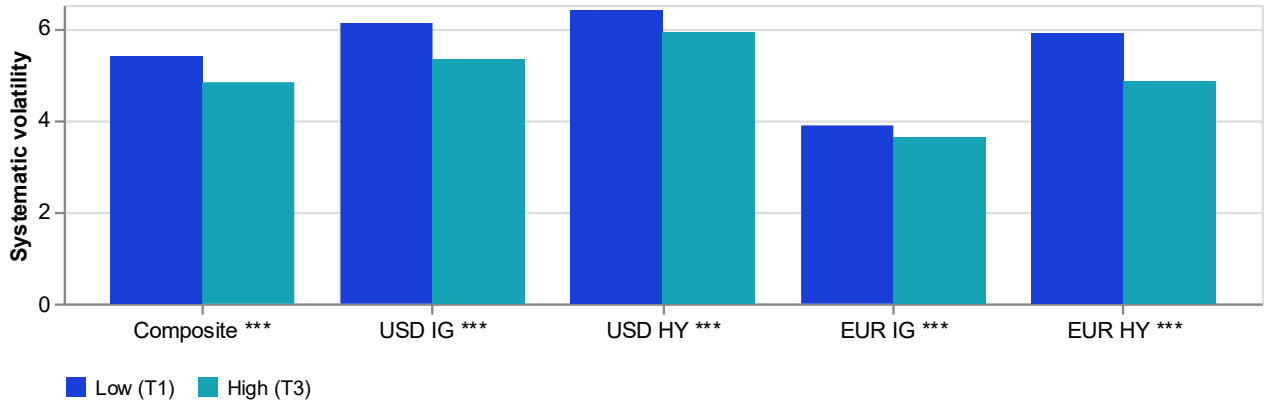
It is important to note that we do not claim a causal relationship between issuers' sustainability risk profiles (measured by MSCI ESG Ratings) and any of the fundamental metrics. We do establish a strong correlation and propose a transmission mechanism in which stronger sustainability profiles may result in overall higher credit quality.

Systematic-risk channel

Taken together, the evidence from the cash-flow channel — higher profitability, more robust debt-servicing capacity and lower leverage — paints a picture of stronger financial resilience among high-ESG-rated issuers. These corporate fundamentals suggest that such firms are not only better positioned to sustain operational distress, but may be more adaptable in responding to macroeconomic shocks. Building on this premise, we next examined whether these advantages translated into lower exposure to systematic risk — that is, whether stronger ESG profiles were associated with reduced sensitivity to market-wide disruptions.

Did bonds of issuers with higher ESG Ratings display lower systematic risk? We used systematic volatility as a measure for systematic risk, comparing it across the ESG-rating terciles and across the bond universes (see the chart and table below). We found that **bonds of issuers with high MSCI ESG Ratings had lower systematic volatility than those of issuers with low ESG Ratings across all bond universes**. The bar charts provide a visual representation of the detailed results shown in the table below (lower numbers indicate lower systematic risk).

Systematic volatility of ESG Rating terciles

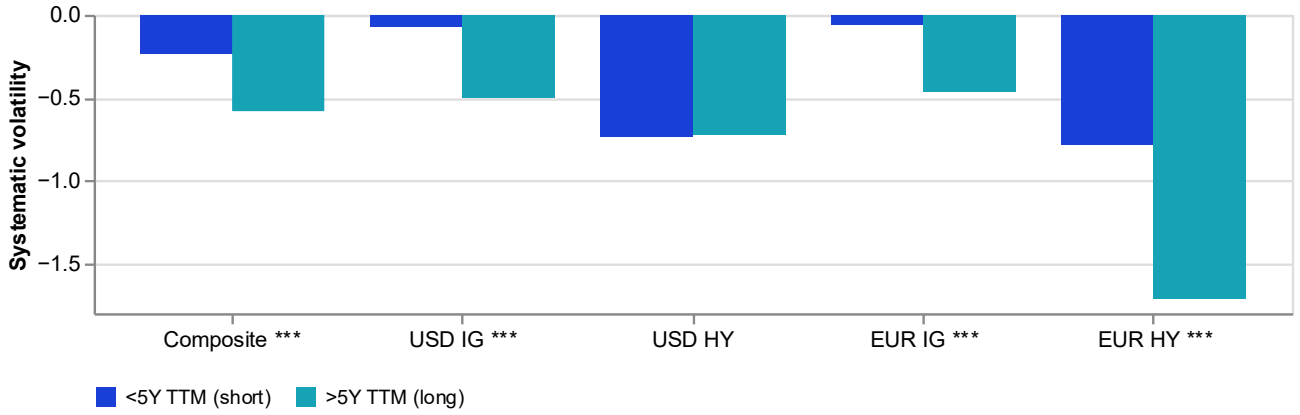


	Low ESG tercile (T1)	High ESG tercile (T3)	T3 (high) - T1 (low)			T3 (high) > T1 (low)	
	Mean	Mean	Mean	25th percentile	75th percentile	% of sample	p-value
Composite universe	5.38	4.82	-0.52	-0.70	-0.39	100.0	0.000***
USD IG	6.11	5.32	-0.76	-1.08	-0.48	100.0	0.000***
USD HY	6.40	5.90	-0.50	-0.73	-0.21	90.0	0.000***
EUR IG	3.88	3.62	-0.20	-0.35	-0.04	85.0	0.000***
EUR HY	5.89	4.85	-0.97	-1.30	-0.65	96.7	0.000***

This chart and table show the equal-weighted annualized systematic risk (%) of the lowest- and highest-ESG-score terciles from January 2015 to December 2024 (120 month-end samples). The p-value reflects a one-sided test of the null hypothesis that the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

To analyze the differences through the maturity lens, we looked at systematic risk spread between the highest- and lowest-ESG-rated issuers across 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 with longer maturities across all bond universes**, though the difference was negligible in USD HY. The bar charts provide a visual representation of the detailed results shown in the table below.

Systematic-volatility spread of ESG-rating terciles across maturities

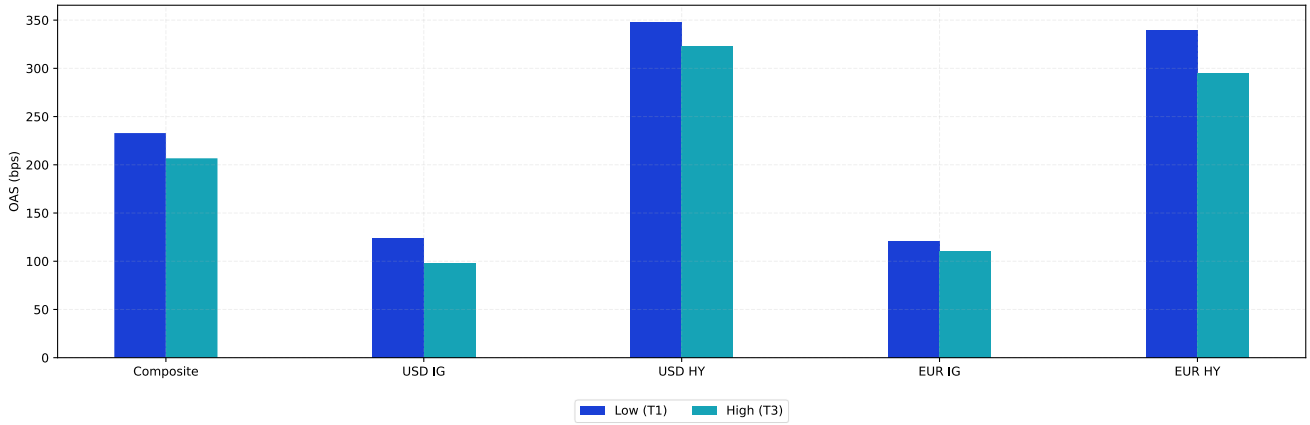


	<5Y TTM (Short)	>5Y TTM (Long)	Long - Short			Long < Short	
	Mean	Mean	Mean	25th percentile	75th percentile	% of sample	p-value
Composite universe	-0.23	-0.58	-0.29	-0.53	-0.05	81.7	0.000***
USD IG	-0.07	-0.51	-0.36	-0.77	0.02	74.2	0.000***
USD HY	-0.73	-0.72	0.04	-0.23	0.29	46.7	0.848
EUR IG	-0.06	-0.46	-0.3	-0.62	-0.07	85.8	0.000***
EUR HY	-0.78	-1.71	-0.86	-1.61	-0.07	78.3	0.000***

The chart and table show the equal-weighted systematic-risk (%) spread between the highest- and lowest-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 2015 to December 2024 (120 month-end samples). The p-value reflects a one-sided test of the null hypothesis that the mean difference is equal to zero. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

Did issuers with higher MSCI ESG Ratings realize lower cost of capital and consequently higher valuation of their bonds? As we showed earlier, issuers with high MSCI ESG Ratings showed consistently lower absolute and residual OAS (after controlling for duration, credit quality and liquidity differences). Everything else equal, this should lead to an overall lower cost of debt for the issuer and consequently higher valuation of their debt securities relative to their peers.

Average issuer-specific absolute OAS of ESG-rating terciles



The chart shows the month-end equal-weighted average absolute OAS of the highest- and lowest-ESG-rating terciles from January 2015 to December 2024. Source: MSCI ESG Research

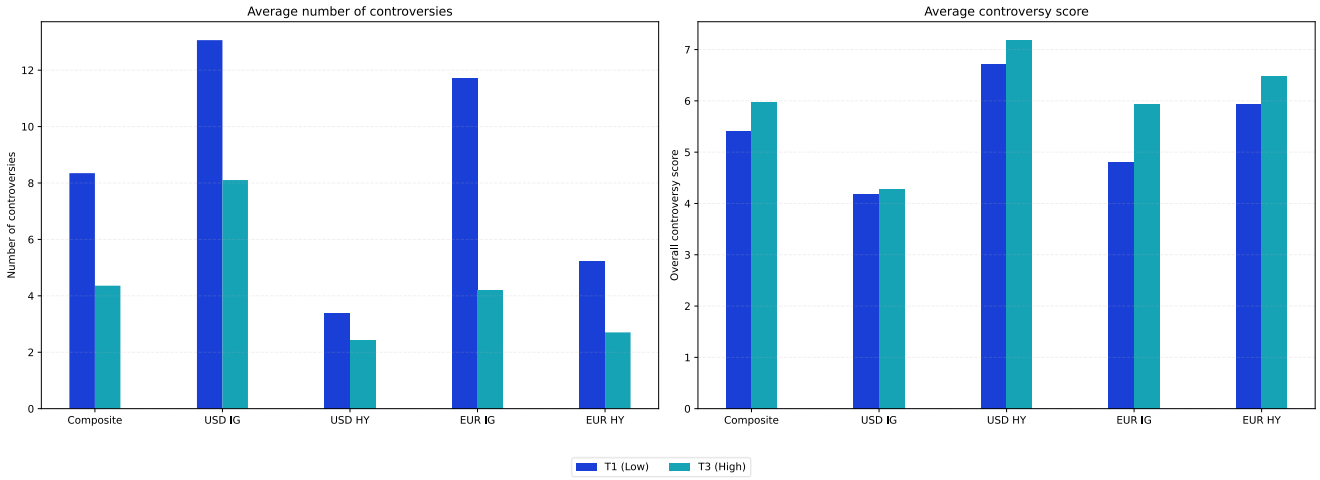
Idiosyncratic-risk channel

For the last part of our transmission-channel analysis, we tested whether issuers that effectively managed sustainability-related risks (measured by MSCI ESG Ratings) exhibited better business and operational risk management. We would expect this risk-management capacity to lead to fewer value-destroying incidents (e.g., penalized breaches of business ethics) and consequently to lower idiosyncratic risk of their bonds, after accounting for common factors including credit quality.

Did companies with higher ESG Ratings exhibit better risk-management capabilities, preventing involvement in negative incidents? While there is no single quantitative measure of a company's risk-management quality, we may approximate it by looking at the frequency with which the company experiences idiosyncratic (i.e., not market-wide) negative events. Using MSCI ESG Controversies to

represent such events, we found that issuers with low MSCI ESG Ratings were indeed involved in a higher number of negative incidents and had overall lower controversy score, which accounts for the severity and status of the controversy, as well as the firm's role in it (see the chart below). Please note that MSCI ESG Controversies are incorporated into MSCI ESG Ratings, though they form only a part of the entire assessment. So, while it is reasonable to expect that lower-rated companies would on average have a higher number of controversies (which on their own may lower the MSCI ESG Rating), this relationship is not automatic.[5]

Number of controversies and overall controversy score by ESG-rating tercile

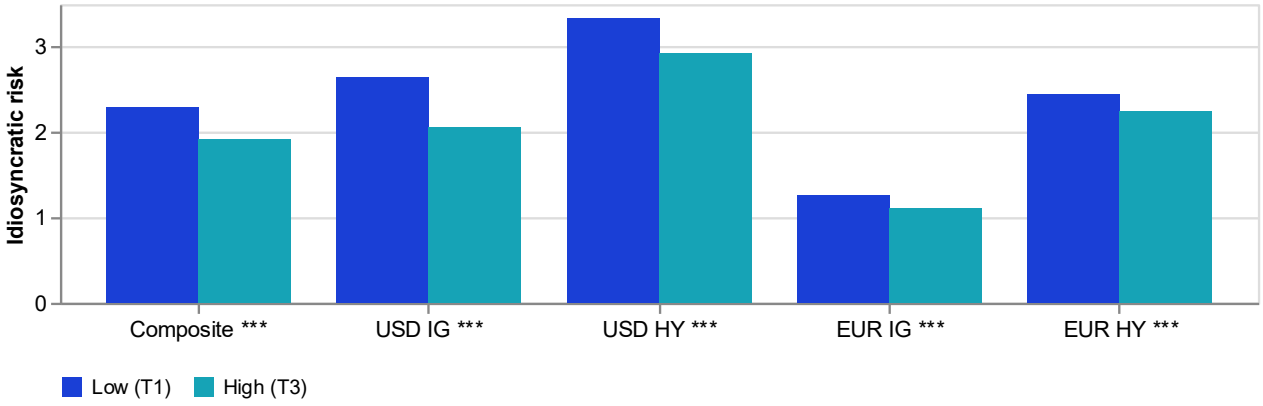


This chart shows the average number of controversies and overall controversy score of the highest- and lowest-ESG-rating tercile issuers from January 2015 to December 2024. Controversy identification and scoring follow MSCI ESG Controversies and Global Norms Methodology. The controversy score ranges from 0 to 10, where 0 indicates severe and widespread involvement in controversies and 10 no involvement in controversies. Source: MSCI ESG Research

To determine whether bonds of issuers with higher MSCI ESG Ratings realized lower idiosyncratic market risk, we compared the residual volatility of the bonds from issuers in the top and bottom ESG-rating terciles. We found that **bonds of high-ESG-rated issuers had significantly lower idiosyncratic risk than those of low-ESG-rated issuers across the board**.

[5] Please refer to MSCI ESG Ratings Methodology and MSCI ESG Controversies and Global Norms Methodology for more details.

Idiosyncratic risk of ESG-rating terciles



	Low ESG tercile (T1)	High ESG tercile (T3)	T3 (high) - T1 (low)			T3 (high) > T1 (low)	
	Mean	Mean	Mean	25th percentile	75th percentile	% of sample	p-value
Composite universe	2.29	1.93	-0.35	-0.45	-0.2	100	0.000***
USD IG	2.64	2.06	-0.55	-0.8	-0.32	100	0.000***
USD HY	3.33	2.92	-0.4	-0.48	-0.16	96.7	0.000***
EUR IG	1.26	1.11	-0.13	-0.18	-0.09	95.8	0.000***
EUR HY	2.44	2.24	-0.2	-0.46	0.02	70.8	0.000***

This exhibit shows the equal-weighted annualized idiosyncratic risk (%) for the lowest- and highest-ESG-score terciles for each universe from January 2015 to December 2024 (120 month-end samples). The p-value reflects a one-sided test of the null hypothesis that the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

We observed that companies with high MSCI ESG Ratings showed a lower likelihood of suffering from issuer-specific risks than the low-rated ones, after accounting for differences in credit quality. These results suggest that incorporating MSCI ESG Ratings into portfolio construction may offer additional information that can help investors manage risks in their bond portfolios.

In summary, in the first part of the transmission-channel analysis, we explained how a more robust sustainability risk profile may feed into stronger credit metrics and be associated with a greater distance to default, thus complementing traditional credit analysis. In the second and third parts of this paper, using the MSCI MAC Factor Model that accounts for common fixed-income factors, including credit quality, we showed that MSCI ESG Ratings provided additional power in explaining market risk.

Sustainability risk and performance of corporate bonds

The transmission-channel analysis illustrated the relationship between companies' sustainability risk profile and their fundamentals and market risk. Next, we wanted to see how these differences may have driven the performance of bonds after accounting for traditional fixed-income risk and return drivers.

Did information in MSCI ESG Ratings add value over traditional credit factors?

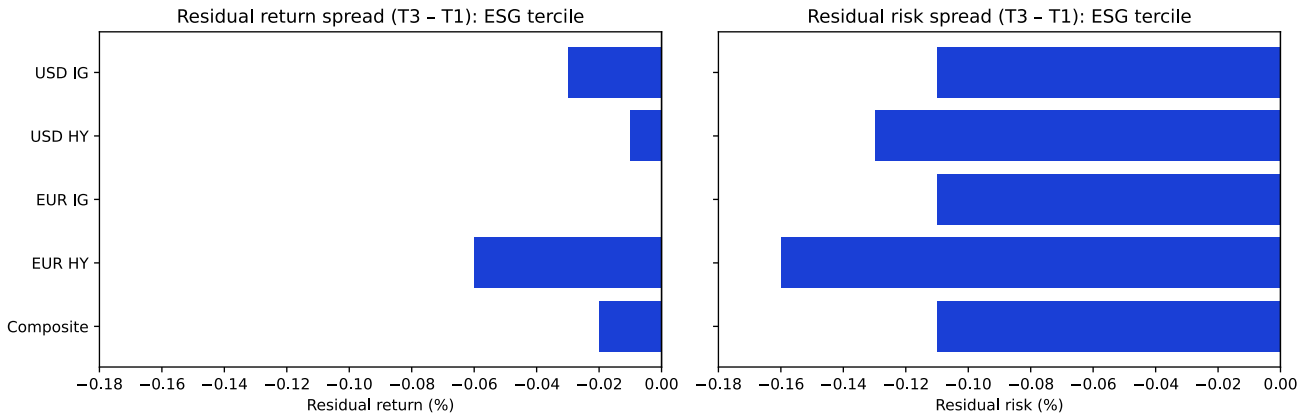
We evaluated this question by analyzing monthly returns and running a performance attribution using the MSCI MAC Factor Model. Specifically, we isolated residual returns after controlling for traditional fixed-income risk factors, such as interest-rate sensitivity, credit quality and inflation. We also obtained residual risk, measured as the standard error (volatility) of the residual returns.

To assess the incremental value of MSCI ESG Ratings, we compared residual returns and associated risks between the top and bottom terciles, based on the aggregate ESG score and individual E, S and G pillar scores, across the bond universes over our study period.

The results, as shown in the two sets of charts and tables below, indicated marginally lower residual returns associated with MSCI ESG Ratings or individual pillar scores after controlling for traditional credit factors. The results also indicated a more pronounced decrease in residual risk associated with higher MSCI ESG Ratings and individual pillar scores, however, suggesting that their incorporation could provide risk-management benefits beyond traditional credit considerations and compensate for the marginally lower residual return.

Residual-return spread and residual-risk spread of ESG terciles

Panel A: Average residual-return and residual-risk spread



Panel B: Residual-return statistical table

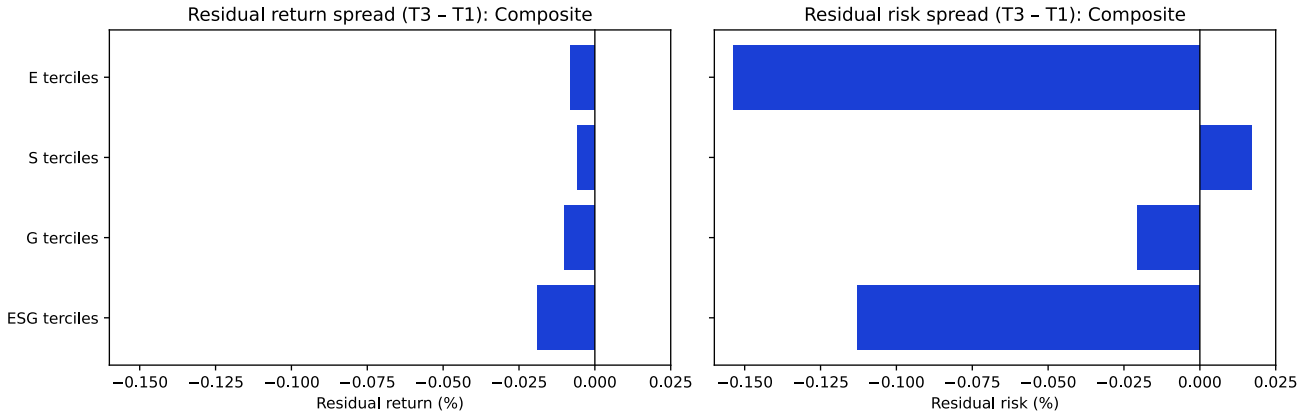
	Low ESG tercile (T1)	High ESG tercile (T3)	T3 (high) - T1 (low)	T3 (high) > T1 (low)

	Mean	Mean	Mean	25th percentile	75th percentile	% of sample	p-value
Composite universe	0.13	0.11	-0.02	-0.05	0.03	53.3	0.869
USD IG	0.15	0.11	-0.03	-0.08	0.04	59.2	0.984
USD HY	0.2	0.19	-0.01	-0.06	0.07	49.2	0.608
EUR IG	0.05	0.05	0	-0.06	0.05	51.7	0.419
EUR HY	0.18	0.12	-0.05	-0.17	0.11	55.8	0.944

The charts and table show the equal-weighted annualized residual-return (%) and residual-risk (%) spread between the highest- and lowest-ESG-score terciles from January 2015 to December 2024 (120 month-end samples). Residual returns were calculated from the MSCI MAC Factor Model after controlling for common factor returns (including credit quality). Residual risk is volatility of residual returns. The p-value reflects a one-sided test of the null hypothesis that the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

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 (high) - T1 (low)			T3 (high) > T1 (low)	
	Mean	Mean	Mean	25th percentile	75th percentile	% of sample	p-value
E terciles	0.12	0.12	-0.01	-0.05	0.04	45	0.686
S terciles	0.12	0.11	0	-0.04	0.04	49.2	0.660
G terciles	0.12	0.11	-0.01	-0.04	0.03	47.5	0.848
ESG terciles	0.13	0.11	-0.02	-0.05	0.03	46.7	0.869

The charts and table show the equal-weighted annualized residual-return (%) and residual-risk (%) spread between the highest (T3) and lowest (T1) E-, S- and G-pillar scores and industry-adjusted ESG-rating terciles for the composite universe from January 2015 to December 2024 (120 month-end samples). Residual returns are calculated from the MSCI MAC Factor Model after controlling for common factor returns (including credit quality). Residual risk is volatility of residual returns. The p-value reflects a one-sided test of the null hypothesis that the mean difference is equal to 0. ***, ** and * indicate significance at the 99%, 95% and 90% confidence levels, respectively. Source: MSCI ESG Research

Conclusion

We enhanced the original analysis in the study by Mendiratta, Varsani and Giese (2021) by employing two key methodology changes:

1) A robust regression-based approach to control for traditional risk-premia drivers in assessing whether sustainability risk is priced in the credit market.
2) Use of the MSCI MAC Factor Model to account for traditional fixed-income factors in performance attribution.

With the extended study period and the methodological enhancements to more accurately assess sustainability as a risk and return driver in the credit market, we have confirmed the key results of the original study.

We tested the three transmission channels (the cash-flow, systematic-risk and idiosyncratic-risk channels) across a large sample of corporate bonds included in the MSCI USD and EUR Corporate Bond Indexes. Set within the Merton credit-risk model, we expected these transmission channels to be most effective in reducing the downside risk, and for the results to be more pronounced with decreasing credit quality and increasing time to maturity (i.e., increasing probability of default). These assumptions were shown to be true through the tests conducted in the study.

We validated the assumptions underlying the cash-flow channel by showing that high-ESG-rated issuers showed better financial metrics, leading to a higher overall credit quality. Bonds of those issuers also showed significantly lower levels of systematic and idiosyncratic risk, even after controlling for common factor influences, including credit quality.

Looking at performance, we saw that bonds of high-ESG-rated issuers delivered marginally lower residual returns (after controlling for common-factor influence) compared to those of low-rated issuers over the study period, yet they also exhibited an even more pronounced reduction in residual risk.

In summary, we found that sustainability-related risks were not fully captured in common credit-quality measures, such as credit ratings, which meant that the information contained in MSCI ESG Ratings may have provided additional relevant insights for credit investors.

Beyond potentially enhancing risk-adjusted returns, these findings may prove useful in investment and risk-management processes, such as asset allocation and security selection, setting risk limits and portfolio monitoring.

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