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Do Banks Price ESG Performance? Regional Evidence From Europe and the United States

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ABSTRACT

This study examines whether corporate ESG performance affects syndicated loan spreads and whether the effect differs between Europe and the United States. Using LPC DealScan loans matched with Refinitiv ESG ratings for 2010–2023, we find that higher ESG scores are associated with lower loan spreads; a one-standard-deviation increase implies a 10.64-basis-point reduction. Environmental and social pillars drive the effect more strongly than governance. The negative ESG–spread relation is stronger in Europe and intensifies after the 2015 Paris Agreement, highlighting the roles of risk mitigation and institutional context in bank loan pricing.

JEL Classification: G21, G32, G12, Q56

1 | Introduction

With a heightened sense of responsibility towards the environment and society, prompted by the United Nations Sustainable Development Goals (SDGs) and the Paris Agreement, Environmental, Social, and Governance (ESG) factors have become a central priority for chief executives (BNP Paribas CIB 2019). As CEOs respond to rising consumer demand, shifting employee expectations, and tightening regulation, 88% say the business case for sustainability is stronger than it was 5 years ago, and 99% plan to maintain or increase their sustainability commitments (UNGC-Accenture 2025). This rapidly developing sustainability trend reflects corporations moving from shareholder theory to a stakeholder perspective. The shareholder theory by Friedman (1970) argues that the social responsibility of business is 'to use its resources and engage in activities designed to increase its profits', subject to operating within the 'rules of the game'. In contrast, the stakeholder theory posits that firms create value by managing relationships with multiple stakeholders (Freeman 1984). Likewise, the banking regulators, notably the EBA (2020) and the ECB (2020), have issued guidance encouraging banks to account for borrowers' ESG risks in credit assessment and monitoring, with the aim of shaping lending decisions accordingly.

In response to this changing landscape, research in sustainable finance is growing rapidly. However, most of the existing literature on sustainable debt markets focuses on public debt, particularly bond financing (e. g., Fatica et al. 2021; Flammer 2021; Hoepner et al. 2025; Ma et al. 2019). Yet, whether ESG information is priced similarly in private debt markets remains much less clear. This distinction is practically important because syndicated loans differ fundamentally from public bonds in how information is produced and used. Whereas bond investors rely primarily on public disclosure and market-based pricing, syndicated lenders engage in active screening, intensive due diligence, private information production, and ongoing borrower monitoring within a negotiated contractual setting. Prior research shows that syndicated loan markets incorporate credit risk more quickly than bond markets (Altman et al. 2010), and banks devote substantial effort to assessing borrower risk when determining loan terms (Strahan 1999). ESG may therefore be particularly salient in

syndicated lending because it can inform assessments of default risk, agency problems, monitoring intensity, and contract structure.

The existing literature suggests that sustainability-related information can influence loan pricing, but the evidence is dispersed across international, United States, and European contexts, as well as across different ESG channels. International studies highlight the role of country sustainability (Hoepner et al. 2016), borrower ESG performance and risk (Liu et al. 2025), and lender-side incentives (Huang et al. 2024), while US evidence shows that CSR concerns and adverse ESG incidents are associated with less favorable bank loan terms (Goss and Roberts 2011; He et al. 2021). In Europe, emerging evidence indicates that CSR ratings (Drago and Carnevale 2020a), ESG practices (Eliwa et al. 2021), and EU Taxonomy-eligible revenue shares (Sautner et al. 2025) are also reflected in corporate loan pricing, although the effects vary across institutional settings. What remains less clear is whether borrower ESG performance is priced differently in the syndicated loan market across Europe and the United States within a unified empirical framework.

This article addresses this gap by examining whether corporate borrowers' ESG performance influences syndicated loan pricing and whether this effect differs between Europe and the United States. This question matters because syndicated loans are a major source of corporate external finance, and loan spreads provide a direct measure of how lenders assess borrower risk and quality. If stronger ESG performance is associated with lower borrowing costs, this would suggest that lenders view ESG as financially relevant information rather than merely symbolic disclosure. This question is informed by the risk-mitigation view, which suggests that stronger borrower ESG performance may reduce information asymmetry, strengthen managerial discipline, and signal long-term orientation and responsible behavior—features that lenders may value when evaluating borrower quality and pricing loans. Europe and the United States provide a useful contrast in ESG-related regulatory settings and political commitment, which is grounded in institutional theory. The former adopts prescriptive, rules-based sustainability disclosure and banking norms, while the latter follows a more market-driven, voluntary approach. These regional differences are important not only for interpreting the results but also for structuring the empirical analysis, as they imply that the pricing relevance of ESG should be evaluated relative to the institutional setting in which lending occurs.

Drawing on loan facility-level data with firm-level ESG and financial controls for the period of 2010–2023, the analysis yields several key findings. Beyond statistical significance, the estimated effects are economically meaningful. In the baseline specification for the full sample, a one-standard-deviation increase in the aggregate ESG score is associated with a 10.64-basis-point reduction in the loan spread, evaluated at the sample median spread, implying an approximate annual interest saving of US$0.41 million for a typical facility. This implied effect is substantially larger in Europe, where the corresponding reduction is 74.03 basis points, than in the United States, where the effect is 8.69 basis points, indicating that ESG performance is priced much more strongly in the European syndicated loan market. These magnitudes suggest that ESG performance is not only statistically related to syndicated loan pricing but also relevant in practical borrowing-cost terms. This finding supports the view that ESG mitigates lender risk and enhances borrower credibility.

This article contributes to the literature on ESG and bank lending by several ways relative to the extant literature. Prior studies show that borrower sustainability is reflected in bank loan pricing, particularly through the relationship between CSR concerns and loan spreads in US bank lending (Goss and Roberts 2011) and between ESG practices and debt costs in European settings (Eliwa et al. 2021). More recent syndicated-loan research shifts attention to institutional and policy channels, showing that environmentally oriented banks lend more cheaply to green firms, especially after the Paris Agreement (Degryse et al. 2023a), and that firms with greater EU Taxonomy-eligible revenues experience lower syndicated-loan spreads in the European regulatory context (Sautner et al. 2025). In this study, rather than testing whether sustainability matters on average in different regions or whether green lenders reward green borrowers, we contribute to the literature by (i) examining whether the pricing of borrowers' ESG varies systematically across regions, and (ii) whether that heterogeneity changes after the Paris Agreement. In effect, we extend the literature from average ESG pricing effects towards the institutional and policy conditions under which sustainability becomes credit-relevant in syndicated lending.

The remainder of the article is structured as follows. Section 2 reviews the literature and proposes hypotheses. Section 3 provides an overview of the data and methodology. The empirical findings are presented and discussed in Section 4. Section 5 provides a battery of robustness tests. Finally, we conclude in Section 6.

2 | Literature Review and Hypothesis Development

2.1 | Borrower's ESG Performance and Cost of Debt

A key trend in corporate finance is the growing importance of the loan market, particularly because banks play a central role in screening and monitoring borrowers (Chava et al. 2009; Graham et al. 2008). Prior research shows that syndicated loan markets incorporate credit risk more quickly than bond markets (Altman et al. 2010), and banks devote substantial effort to assessing borrower risk when determining loan terms (Strahan 1999). To manage credit risk, lenders can adjust both price and non-price terms, including loan spreads, collateral requirements, covenant intensity, and maturity (Goss and Roberts 2011). Within this setting, borrower ESG performance may provide non-financial information relevant to lenders' risk assessment. Although lending decisions rely primarily on financial information, lenders may also consider non-financial borrower characteristics when evaluating risk. ESG performance may help banks assess regulatory, operational, reputational, and governance-related risks that are not fully captured by

standard financial indicators. Consistent with this view, firms with stronger ESG profiles are often perceived as lower risk borrowers, potentially leading to more favorable lending terms (Hoepner et al. 2016), while managerial social capital has also been shown to reduce idiosyncratic risk and improve access to external finance (Al-Bataineh et al. 2025).

Hence, the central mechanism in this study is the risk-mitigation view. If stronger ESG performance is associated with lower firm-specific risk, lower operational and reputational exposure, and greater resilience, banks may incorporate this information into loan pricing. This logic is consistent with broader evidence that firms engaging in CSR-related activities can benefit in capital markets. Marshall et al. (2022), for example, show that compliance with mandatory CSR legislation in India is associated with higher foreign institutional investment, consistent with lower information asymmetry and reduced perceived non-financial risk. Related studies also find that firms with high ESG scores exhibit lower idiosyncratic risk (Lee and Faff 2009), and higher ESG scores are associated with lower firm-specific volatility (Boutin-Dufresne and Savaria 2004). In a credit market setting, these findings are relevant because lower firm-specific risk should improve a borrower's ability to meet debt obligations. Although ESG does not eliminate all vulnerabilities, and its benefits may weaken during tail events (Chaudhry et al. 2025), the general prediction from a risk-mitigation perspective is that stronger ESG performance should be associated with more favorable borrowing conditions.

Existing evidence on the cost of debt is broadly consistent with this view, although not uniformly so. Lower perceived credit risk is generally associated with lower loan spreads (Graham et al. 2008). Goss and Roberts (2011) provide early evidence that banks incorporate CSR-related information into lending decisions and charge higher spreads to firms with CSR concerns. Subsequent studies similarly link ESG controversies (He et al. 2021) and corporate social irresponsibility (Becchetti et al. 2023) to higher borrowing costs. Other studies show that the pricing implications of ESG vary with borrower credit ratings (Bae et al. 2018a), governance quality (Bae et al. 2018b), and the consistency of sustainability engagement (Francis et al. 2018). Hmaittane et al. (2023) find that pricing benefits accrue only to borrowers with high-quality, diversified sustainability profiles. Overall, prior research suggests that banks do consider ESG-related information, but the strength and direction of the pricing effect may depend on which ESG dimension is being measured and how that dimension maps into borrower risk.

This distinction is important because ESG dimensions map to distinct credit-relevant risk channels and differ in verifiability and contractibility; banks need not price ESG as a single index (He et al. 2021). Hence, estimating both aggregate- and pillar-level models allows us to identify which components provide incremental information on loan spreads beyond conventional financial controls and credit ratings, and whether aggregation masks economically meaningful heterogeneity. Environmental performance may affect expected credit risk through several channels: strong performance can mitigate regulatory, litigation, reputational, and transition-related risks, whereas poor performance can amplify them. Prior studies suggest that environmental performance is relevant for bank loan pricing, although the evidence is mixed. Nandy and Lodh (2012) find that only firms with strong environmental performance benefit from lower loan spreads, while Chava (2014) shows that environmental concerns increase borrowing costs, but environmental strengths do not uniformly reduce them. Cai and He (2022) likewise report that weaker environmental responsibility is associated with higher loan spreads. Nevertheless, the evidence remains mixed. Qian et al. (2023) report no significant effect of environmental performance, whereas Dai et al. (2023), using a sample of listed US firms, find that higher environmental scores are associated with higher loan spreads. This result is notably at odds with the broader evidence for both the United States and Europe, and the study provides little explanation for why its findings differ.

Similarly, the social dimension may influence loan pricing through labor relations, customer trust, supply-chain stability, and reputational exposure. Firms involved in product recalls face higher loan costs (Zhang et al. 2022), whereas firms with fairer employee treatment (Fard et al. 2022) and higher employee satisfaction (Chi and Chen 2021) benefit from lower borrowing costs. A common interpretation is grounded in stakeholder theory: better employee welfare may enhance productivity and operating resilience, thereby improving expected future cash flows and reducing perceived credit risk. In contrast, Hoepner et al. (2016) find that higher firm-level social scores are associated with higher credit spreads, which they attribute to lenders viewing some socially oriented investments as weakly connected to primary stakeholders and shareholder value. Pohl et al. (2023), however, find no significant association between borrower social performance and loan spreads, arguing that social factors are less likely to affect pricing where environmental performance dominates sustainability-linked loan structures.

The literature on governance also yields contradictory evidence. Compared with the environmental and social pillars, governance appears to be less consistently priced into bank loans. Cheung et al. (2018) show that better governance is associated with lower loan spreads only in more stakeholder-oriented countries, while Hoepner et al. (2016) and Pohl et al. (2023) find no significant governance effect. This weaker evidence may reflect the fact that their samples largely consist of listed and rated firms, for which lenders can infer governance quality from sources other than ESG scores. In contrast, Qian et al. (2023) find that stronger governance is associated with lower loan rates in China, which they attribute to differences in the institutional and economic context, although they also note the limitation of a relatively small sample size.

Taken together, the literature suggests that ESG performance can matter for loan pricing because it provides non-financial information relevant to lender risk assessment, but that aggregate ESG scores may mask meaningful heterogeneity across the environmental, social, and governance pillars. Estimating both aggregate and pillar-level models, therefore, allows us to assess whether stronger ESG performance is associated with lower direct borrowing costs overall, and whether some dimensions

are more credit-relevant than others. On this basis, we propose the following hypotheses:

H1a *The aggregate ESG score of a borrowing firm is inversely associated with its cost of bank financing.*

H1b *The Environmental score of a borrowing firm is inversely associated with its cost of bank financing.*

H1c *The Social score of a borrowing firm is inversely associated with its cost of bank financing.*

H1d *The Governance score of a borrowing firm is inversely associated with its cost of bank financing.*

2.2 | Institutional Context in ESG Performance and Bank Loan Pricing

This prediction aligns with Institutional Theory, which posits that firms' strategic and organizational decisions are shaped by external social, political and economic pressures, as they seek to align with legitimized practices or enhance their legitimacy in the eyes of stakeholders (Jennings and Zandbergen 1995; North 1990). In line with this theory, recent research highlights significant regional variations in the pricing of sustainable debt instruments such as sustainable loans and bonds. The existence of a greenium—a lower borrowing cost for sustainable debt—varies across financial markets due to differences in regulatory frameworks, institutional contexts, and even political commitment.

Institutional context plausibly moderates the ESG–loan cost nexus by shaping both the informativeness of ESG signals and lenders' incentives to incorporate them into pricing (Gao et al. 2021). The literature based on non-European market settings suggests that sustainability-related information can affect bank loan pricing, but the underlying channels differ across studies. Using cross-country loan data, Hoepner et al. (2016) find that country-level sustainability characteristics are associated with lower bank loan costs, while they do not find conclusive evidence that firm-level sustainability is similarly reflected in interest rates. More recent international evidence separates distinct ESG dimensions. Liu et al. (2025) show that higher event-driven ESG risk is associated with higher loan spreads, whereas stronger disclosure-based ESG performance is associated with lower spreads. Huang et al. (2024) identify a different mechanism: banks with lower ESG performance offer more favorable loan terms to firms with higher ESG performance, which they interpret as evidence consistent with lender-side ESG washing. In the US context, Goss and Roberts (2011) show that firms with social responsibility concerns pay 7–18 basis points more in bank loan spreads, while He et al. (2021) find that adverse ESG incidents are associated with higher spreads, lower loan size and stricter non-price loan terms.

Kim and Kim (2024) show that mandatory Green House Gas (GHG) disclosure can amplify the informational value of voluntary ESG disclosure. Gao et al. (2026) suggest that voluntary versus mandatory ESG evaluations can trigger strategic responses, implying that disclosure frameworks may change the information environment without proportional improvements in the underlying ESG behavior. Similarly, Ho et al. (2024) indicate that ESG–outcome relations depend on stakeholder engagement and financial constraints. In the loan markets, this implies lenders should price ESG more strongly where disclosure is standardized and enforcement credible, and more weakly where ESG information is noisier or easier to manage.

In European markets, the evidence is more limited but growing. Drago and Carnevale (2020a), using the European syndicated loan market, find that CSR ratings are related to loan spreads, although the relation is not uniformly linear: low-CSR firms pay higher spreads, but very high CSR ratings are not always rewarded, and the benefits of stronger CSR are more evident in countries that pay greater attention to sustainability. Using firms from 15 EU countries, Eliwa et al. (2021) show that both ESG performance and ESG disclosure are associated with a lower cost of debt, with stronger effects in more stakeholder-oriented settings. Finally, Sautner et al. (2025) show that firms with larger EU Taxonomy-eligible revenue shares obtain lower syndicated loan interest rates, indicating that sustainability-related information in European loan markets is also priced through a specific policy-linked channel. The banking regulators, notably the EBA (2020) and the ECB (2020), have issued guidance encouraging banks to account for borrowers' ESG risks in credit assessment and monitoring, with the aim of shaping lending decisions accordingly. Furthermore, the green asset ratio (EBA 2021), which measures the proportion of bank assets invested in taxonomy-compliant activities, may redirect investments towards sustainable financial instruments. Consequently, the following hypothesis is proposed.

H2. *: The effect of borrowers' ESG performance on bank loan pricing is stronger in Europe than in the United States.*

3 | Data and Methodology

3.1 | Data and Sample Selection

Data are collected from two main sources, namely, Refinitiv DealScan and Datastream. We obtain syndicated loan data from Refinitiv DealScan via Wharton Research Data Services (WRDS), a widely recognized and validated source in empirical corporate finance research (e.g., Chava and Roberts 2008; Ivashina 2009). DealScan provides granular information on loan contract features, including pricing terms, maturity, and loan type. Syndicated loans may comprise multiple facilities that differ in structure—such as term loans and revolving credit lines—and contractual terms. Following Qian and Strahan (2007) and Santos (2011), we perform the main tests at the facility level; that is, we treat the facilities in each deal as different loans. The baseline regression models include a comprehensive set of loan-level control variables, such as loan amount, maturity, number of lenders, investment grade, secured, general purpose, and revolver (for full definitions, see Table 1).

The borrowers' ESG performance is measured using Refinitiv Asset 4 ESG scores. We use Refinitiv because it offers a broad coverage for publicly listed firms across regions over our sample period and provides a consistent, transparent pillar structure (E,

TABLE 1 | Variable definitions and data sources.

Variable	Definition	Source
Spread	Natural logarithm of spread in basis points. Spread is defined as the amount the borrower pays in basis points over LIBOR or equivalent for each dollar drawn down	LPC DealScan
ESG score	The ESG Score is a weighted average of the Environment, Social, and Governance scores, reflecting a company's overall ESG performance. Measured on 0–100 scale	Refinitiv
Environmental score	The Environmental Score assesses a company's ability to manage environmental risks and opportunities. Measured on 0–100 scale	Refinitiv
Social score	The Social Score evaluates how well a company manages relationships with employees, customers, and communities. Measured on 0–100 scale	Refinitiv
Governance score	The Governance Score measures the quality of a company's leadership, business ethics, and transparency. Measured on 0–100 scale	Refinitiv
Loan amount	Natural logarithm of the loan facility amount in millions of dollars	LPC DealScan
Loan maturity	Natural logarithm of the number of months to maturity of a loan facility	LPC DealScan
# of lenders	Natural logarithm of the number of lenders of a loan facility	
Investment grade	A dummy variable that equals one if the credit rating of the borrower is investment grade and zero otherwise	LPC DealScan
Secured	A dummy variable that equals one if the loan facility is secured by collateral and zero otherwise	LPC DealScan
General purpose	A dummy variable that equals one if the loan facility purpose is general and zero otherwise	LPC DealScan
Revolver	A dummy variable that equals one if the loan facility type is revolver and zero otherwise	LPC DealScan
Assets	Natural logarithm of the borrower's total assets in millions of dollars	Datastream
ROA	Borrower's return on assets. Net income to total assets (%)	Datastream
Leverage	Borrower's total debt to total equity (%)	Datastream
Interest coverage	Borrower's EBIT to interest expense (measured in times)	Datastream

Note: This table describes the variables used in the multivariate regression analysis and data sources.

S and G) that supports comparable cross-country analysis. Alternative providers (e.g., MSCI, Sustainalytics) are also widely used, and ESG ratings are known to exhibit nontrivial disagreement across data vendors due to differences in scope, measurement choices and aggregation rules (see, e.g., Berg et al. 2022). Hence, we use a single provider with stable coverage to reduce provider-switching noise in panel regressions and ensure consistent measurement across Europe and the United States. Accordingly, our baseline analysis relies on Refinitiv's aggregate ESG score and its pillar scores, and we interpret the results as conditional on this measurement framework.

We collect firm-level financial data from Refinitiv Datastream, a widely used source in empirical corporate finance research. To construct a borrower-level panel that links firm characteristics to loan contract terms, we merge facility-level syndicated loan data from Refinitiv DealScan with Datastream, using a two-step borrower-name matching procedure. First, borrower names are matched using the Excel Fuzzy Lookup Add-In to account for variations in spelling, abbreviations and formatting. Second, we require an exact match on the borrower's country of domicile to improve precision and reduce false positives. All matched entries are manually reviewed to ensure validity. This process yields a dataset of borrower firms with reliable firm-level covariates such as total assets, return on assets, leverage and interest coverage—used as control variables in the regression analyses. Firms with no reliable match are excluded, which may slightly reduce coverage, particularly among smaller or private firms.

To investigate whether the Paris Agreement is associated with a change in how lenders price borrower ESG performance in loan spreads, we operationalize the policy timing using a post-Paris Agreement indicator, defining the pre-Paris period as loan facilities originated up to 2015 (inclusive) and the post-Paris period as facilities originated from 2016 onwards. Accordingly, post-Paris equals 1 for loans originated in 2016 and later, and 0 otherwise. The analysis tests whether the ESG–spread relationship shifts after the Paris Agreement by interacting ESG (and separately E, S and G pillar scores) with post-Paris in one of the robustness tests. A strictly pre and post-Paris balanced-borrower design is not feasible here because it would lead to a smaller sample, especially for Europe, where the number of observations is 518 in the present models. Therefore, the pre- versus post-Paris results are suggestive and may be sensitive to the limited number of "switcher" borrowers and to contemporaneous post-2015 (i.e., post-Paris) ESG/regulatory changes.

We also construct a broad Sustainable Corporate Loans (SCL) indicator using DealScan's 'market segment' field. We use DealScan's market-segment field to identify SCL. A facility is coded as 1 if it carries any of the following labels: sustainability-linked, ESG-linked, sustainable finance, green, green pure play

or social; all other facilities are coded as 0. This classification allows us to identify and distinguish SCL structures from conventional loans, following recent approaches in the literature (Degryse et al. 2023a). The resulting variable should therefore be interpreted as a broad DealScan-based SCL classification rather than a narrowly validated SCL measure. In our sample, this classification identifies 151 facilities and is used only for the exclusion-based robustness test.

The sample spans the period from 2010 to 2023 and consists of facility-level observations, where the primary dependent variable is the all-in drawn spread, measured in basis points. We started the sample in 2010 for two key reasons. First, the global financial crisis of 2007–2009 caused severe disruptions in credit markets, and focusing on the post-crisis period enables a more accurate analysis of loan pricing under stabilized market conditions. Second, the availability, consistency and quality of ESG disclosures improved significantly after 2010, enhancing the reliability of ESG-related measures. To ensure data quality and comparability, we exclude facilities with missing spread information and loans extended to financial institutions (SIC codes 6000–6999), because their balance sheet structures differ significantly from those of non-financial corporations. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Due to listwise deletion, observations with missing values in any model are dropped, so sample sizes may differ across specifications.

3.2 | Methodology

We estimate multivariate regression models for the baseline tests built on a wide range of literature on bank lending (e.g., Graham et al. 2008; Campello et al. 2011). To examine the relationship between borrowers' ESG performance and the cost of bank borrowing, we estimate the following regression model:

$$\begin{aligned} Log\,(Spread)_{i,b,t} = {} & a_i + \beta * ESG_{i,t} + \gamma * Loan_{i,b,t} \\ & + \delta * Borrower_{i,t} + \theta_b + \mu_t \\ & + \pi_s + \varepsilon_{i,b,t}, \end{aligned} \tag{1}$$

where the dependent variable $Log\,(Spread)_{i,b,t}$, is the natural logarithm of spread all-in-drawn over LIBOR or equivalent of loan i for borrower b in year t. The primary explanatory variable of interest is the borrower's $ESG_{i,t}$ score reflects the overall environmental, social and governance performance of firm i in year t. This variable serves as a proxy for the borrower's non-financial risk profile as perceived by lenders. In alternative model specifications, we replace the composite ESG score with individual scores for the environmental, social and governance pillars to assess whether any particular dimension is driving the relationship with loan pricing.

The model controls for a comprehensive set of loan-level and firm-level characteristics that could influence the cost of debt. The vector $Loan_{i,b,t}$ includes variables capturing the structure and purpose of the loan contract, namely the logarithm of the loan amount, the loan maturity in months and the number of lenders. These factors proxy for deal complexity, duration risk and investor monitoring, all of which are known to affect spread determination. The vector $Borrower_{i,t}$ includes borrower-specific financial variables, including the logarithm of total assets (as a proxy for firm size), return on assets (ROA) to measure profitability, the leverage ratio (total debt to total equity) and the interest coverage ratio to proxy for debt-servicing capacity. These variables are standard in the bank loan pricing literature and allow us to account for variation in credit risk, firm scale and financial health. α is a constant, and β, γ, δ are the estimated coefficients for the respective variables. θ_b, μ_t and π_s stand for borrower, year and industry fixed effects, respectively, and ε is the residual of the model.

We include borrower fixed effects and industry-year fixed effects to absorb unobserved heterogeneity at both the firm and industry-time levels. This specification controls for time-invariant borrower characteristics, as well as industry-specific macroeconomic conditions, credit market developments and lending norms that vary over time and could otherwise bias the estimated ESG effects. All regression models are estimated with heteroskedasticity-robust standard errors clustered at the borrower level to account for autocorrelation and heteroskedasticity arising from repeated loan observations for the same firm. This ensures valid inference in the presence of firm-level clustering.

4 | Empirical Results and Discussion

This section presents and interprets the main empirical findings. We begin with descriptive and univariate results to provide context on the sample and variable characteristics, followed by baseline regressions and a battery of robustness tests. The results are discussed in relation to the hypotheses outlined earlier and contextualized within the theoretical framework of risk mitigation and institutional theory.

4.1 | Descriptive Statistics and Variable Relationships

As one of our main predictions is that ESG pricing depends on institutional context, we report descriptive statistics separately for Europe and the United States from the outset. Table 2 reports summary statistics for the full sample and for the Europe and United States subsamples. In the full sample, the mean all-in-drawn spread is 177.3 basis points, with substantial dispersion, indicating meaningful heterogeneity in loan pricing. The average ESG Score is 51.59, and the Environmental, Social and Governance pillar scores also exhibit wide cross-sectional variation. European borrowers have higher average spreads and stronger ESG performance than US borrowers, with mean spreads of 182.09 and 174.45 basis points, and mean ESG Scores of 58.04 and 50.17, respectively. The control variables likewise show considerable variation in facility structure and borrower characteristics. Overall, the sample provides sufficient cross-sectional variation to examine whether borrowers' ESG performance is associated with syndicated loan pricing in the multivariate analysis.

Table 3 presents Pearson correlations among key variables. Log (Spread) is negatively correlated with the aggregate ESG

TABLE 2 | Summary statistics.

	Full sample				Europe sample				U.S. Sample			
Variable	**Obs**	**Mean**	**Median**	**SD**	**Obs**	**Mean**	**Median**	**SD**	**Obs**	**Mean**	**Median**	**SD**
Spread	3466	177.30	150.00	110.67	518	182.09	150.00	139.38	2,572	174.45	150.00	101.81
Log (Spread)	3466	5.02	5.01	0.55	518	4.94	5.01	0.75	2,572	5.04	5.01	0.49
ESG score	3466	51.59	52.23	19.71	518	58.04	61.10	19.74	2,572	50.17	50.28	19.31
Environmental score	3466	43.89	44.90	28.51	518	57.49	62.05	25.96	2,572	41.22	42.04	28.06
Social score	3466	53.14	52.67	22.28	518	60.18	62.35	23.41	2,572	51.72	50.79	21.67
Governance score	3466	55.90	58.00	21.37	518	54.95	57.71	22.27	2,572	55.90	58.00	21.10
Loan amount	3466	926.85	500.00	1,102.38	518	982.29	507.78	1,184.04	2,572	941.83	500.00	1,094.13
Log (loan amount)	3466	6.17	6.21	1.26	518	6.10	6.23	1.44	2,572	6.23	6.21	1.21
Log (loan maturity)	3466	3.73	4.09	0.66	518	3.83	4.09	0.58	2,572	3.72	4.09	0.66
Log (# of lenders)	3466	2.10	2.20	0.83	518	1.96	2.08	0.97	2,572	2.16	2.30	0.78
Investment grade	3466	0.81	1.00	0.39	518	0.59	1.00	0.49	2,572	0.90	1.00	0.30
Secured	3466	0.26	0.00	0.44	518	0.25	0.00	0.44	2,572	0.26	0.00	0.44
General purpose	3466	0.65	1.00	0.48	518	0.66	1.00	0.47	2,572	0.67	1.00	0.47
Revolver	3466	0.46	0.00	0.50	518	0.46	0.00	0.50	2,572	0.47	0.00	0.50
Log (assets)	3466	9.09	8.97	1.42	518	9.16	9.16	1.51	2,572	9.01	8.93	1.34
ROA	3466	4.60	4.03	5.83	518	3.99	3.86	5.71	2,572	4.78	4.16	5.96
Leverage	3466	139.35	86.32	185.11	518	115.50	83.57	122.54	2,572	150.92	91.75	201.53
Interest coverage	3466	14.55	5.62	33.92	518	11.20	5.54	23.83	2,572	14.45	5.43	34.38

Note: This table reports summary statistics for the estimation sample loan facilities over the 2010–2023 period. The full sample statistics are based on the global baseline estimation sample; Europe and US statistics are based on their respective regional estimation samples. The dependent variable is all-in-drawn loan spread (in basis points). The key explanatory variables are the aggregate ESG Score, Environmental Score, Social Score and Governance Score; measured on 0–100 scale. All other variables are described in Table 1. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. Obs. denotes the number of observations and SD denotes standard deviation.

Score ($r = -0.29$), with the strongest negative association observed for the Environmental Score ($r = -0.30$), followed by the Social Score ($r = -0.26$) and the Governance Score ($r = -0.13$). The aggregate ESG Score is positively and strongly correlated with its three component pillars, as expected. Correlations between the ESG measures and the other explanatory variables are largely moderate, suggesting that ESG captures information not fully reflected in conventional borrower and loan characteristics.

4.2 | Univariate Analysis of ESG Performance and Loan Spread

Table 4 reports univariate comparisons of loan spreads between firms with high and low ESG performance, where high ESG is defined as above the sample mean and median. The results indicate that firms with stronger ESG profiles benefit from significantly lower loan spreads across all ESG dimensions. The average spread for low-ESG firms is 191.32 basis points, compared with 154.95 basis points for high-ESG firms—a difference of 36 bps that is statistically significant at the 1% level (Welch $t = 11.70$). Similar patterns are observed for each ESG pillar: the environmental score shows the largest differential (44 bps, $t = 14.34$), followed by the social (29 bps, $t = 9.17$) and governance (13 bps, $t = 4.29$) scores. The Wilcoxon rank-sum tests for medians confirm these differences, suggesting robustness to outliers and skewness.

4.3 | ESG Performance and Loan Spread: Baseline Results

Table 5 reports the main multivariate evidence on the relation between borrowers' ESG performance and syndicated loan spreads. The dependent variable in all specifications is the natural logarithm of the all-in-drawn spread. Models 1–4 include industry-year fixed effects, while Models 5–8 additionally include borrower fixed effects. Across specifications, the main result is that stronger borrower ESG performance is associated with lower borrowing costs, and the estimated magnitudes are economically meaningful.

In Model 1, the coefficient on the aggregate ESG score is –0.0028 and statistically significant. Economically, this implies that a one-unit increase in ESG is associated with an approximately 0.28% lower loan spread. Using the full sample median spread of 150 basis points and the ESG standard deviation of 19.71, a one-standard-deviation increase in ESG corresponds to an implied reduction of about 8.28 basis points. Taking the median loan facility amount of US$500 million, this translates into an approximate annual interest saving of about US$0.41 million for a typical facility in the sample. This is meaningful in the syndicated loan market, where even relatively small changes in spreads can materially affect financing costs for large facilities. In the borrower fixed-effects specification (Model 5), the coefficient is statistically significant and even larger in absolute value (–0.0036), implying an approximate 10.64 basis-

TABLE 3 | Pearson correlation matrix.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Log (spread)	1											
2. ESG score	−0.29***	—										
3. Environmental score	−0.30***	0.87***	—									
4. Social score	−0.26***	0.89***	0.74***	—								
5. Governance score	−0.13***	0.64***	0.35***	0.36***	—							
6. Log (loan amount)	−0.23***	0.29***	0.27***	0.28***	0.15***	—						
7. Log (loan maturity)	0.22***	−0.2***	−0.19***	−0.19***	−0.13***	−0.16***	—					
8. Log (# of lenders)	−0.16***	0.14***	0.15***	0.14***	0.05**	0.4***	0.12***	—				
9. Log (assets)	−0.32***	0.49***	0.51***	0.43***	0.23***	0.53***	−0.29***	0.32***	—			
10. ROA	−0.22***	0.03	0.04*	0.03	0.01	0.07***	−0.01	0.02	−0.08***	—		
11. Leverage	0.14***	0.03*	0.03	0.05**	−0.01	0.08***	0.01	0.07***	0.09***	−0.1***	—	
12. Interest coverage	−0.11***	−0.05**	−0.07***	−0.04*	−0.04*	−0.03*	0.01	−0.05**	−0.1***	0.32***	−0.14***	1

Note: This table reports the Pearson correlation coefficients of the continuous variables of interest in this study with the full estimation sample. The dependent variable is all-in-drawn loan spread (in basis points). The key explanatory variables are the aggregate ESG Score, Environmental Score, Social Score and Governance Score; measured on 0–100 scale. All other variables are described in Table 1. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

point reduction for a one-standard-deviation increase in ESG. This suggests that the result is driven not only by cross-sectional differences across firms but also by within-firm improvements in ESG performance over time.

The statistically significant pillar-level results indicate that the aggregate ESG effect is driven primarily by the environmental and social dimensions. The environmental score is negative and significant in both Models 2 and 6, implying a reduction in spreads of roughly 6.84–8.12 basis points for a one-standard-deviation increase. The social score also enters negatively and significantly in Models 3 and 7, with implied reductions of about 7.02–10.03 basis points. In contrast, the governance score is weaker both economically and statistically: its coefficient is smaller in magnitude, which becomes insignificant once the borrower fixed effects are introduced. A plausible explanation is the incremental information overlap. For example, several governance attributes relevant to default risk and agency frictions are already reflected in conventional credit risk controls, such as the firm's investment-grade status and its financial ratios. Whereas, the time-invariant governance quality is further absorbed by the borrowers' fixed effects. As a result, the governance score may add limited information for loan pricing once these standard credit variables are included. However, the environmental and social dimensions may still capture risks, regulatory exposure and stakeholder pressures that are less fully embedded in traditional credit metrics.

The control variables are broadly consistent with standard loan-pricing intuition. Loans with longer maturities are associated with higher spreads, while investment-grade borrowers pay lower spreads. Secured loans carry higher spreads, consistent with collateral being more common in riskier credits and leverage is positively related to borrowing costs. Profitability and interest-coverage capacity are generally associated with lower spreads. Overall, these patterns indicate that the ESG coefficients are identified alongside conventional credit-risk determinants rather than in place of them.

Taken together, the baseline results indicate that borrowers' ESG performance is associated not only with statistically lower loan spreads but also with economically meaningful reductions in borrowing costs. The evidence provides strong support for Hypotheses H1a through H1c and partial support for H1d, with the strongest effects concentrated in the environmental and social pillars. Overall, the findings suggest that banks incorporate ESG information into loan pricing and are consistent with risk-mitigation perspectives, whereby stronger ESG performance signals lower risk exposure, longer-term orientation, and more responsible management.

4.4 | Esg Performance and Loan Spread: Europe versus US

Table 6 presents the regression results on institutional context by estimating the ESG–loan spread relationship separately for Europe and the United States. The purpose is not simply to compare two regional subsamples, but to test whether borrower ESG performance carries different pricing relevance across lending environments that differ in regulatory settings,

TABLE 4 | Univariate analysis of ESG performance and loan spread relationship.

	Welch *t*-test (Spread)			Wilcoxon rank sum test (Spread)		
Variable	**Mean (low ESG)**	**Mean (high ESG)**	**Welch *t*-test**	**Median (low ESG)**	**Median (high ESG)**	**Wilcoxon rank-sum test**
Overall ESG	191.32	154.95	11.7 ***	162	125	W = 4,235,513 ***
Environmental	195.27	150.98	14.34 ***	170	125	W = 4,416,755 ***
Social	187.45	158.81	9.17 ***	160	125	W = 4,129,904 ***
Governance	179.88	166.41	4.29 ***	150	137	W = 3,676,847 ***

Note: This table presents a comparison of loan spreads between firms with below-mean-median (Low ESG) and above-mean-median (High ESG) ESG scores. The first set of columns reports the mean loan spreads for each group, with differences evaluated using Welch's *t*-test. The second set reports the corresponding median values, tested using the Wilcoxon rank-sum test. The dependent variable is the all-in-drawn loan spread (in basis points). The key explanatory variables are the aggregate ESG Score, Environmental Score, Social Score and Governance Score, measured on a 0-100 scale. All other variables are described in Table 1. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. *** denotes statistical significance at the 1% level.

disclosure regimes, political commitment and stakeholder-oriented norms. Across specifications, the main results show that borrower ESG performance is more strongly priced in Europe than in the United States.

For the European subsample (Models 1–4), the coefficients on the aggregate ESG score and all three pillar scores are negative and mostly statistically significant. In Model 1, the coefficient on the overall ESG score is –0.025, indicating that a one-point increase in ESG is associated with an approximately 2.5% lower loan spread. Using the European median spread of 150 basis points and the ESG standard deviation of 19.74, a one-standard-deviation increase in ESG corresponds to an implied reduction of about 74.03 basis points. Taking the median loan amount of US$507.78 million, this is equivalent to an annual interest-cost saving of about US$3.76 million for a typical loan facility. This is economically large and suggests that ESG performance carries substantial pricing relevance in the European syndicated loan market. The pillar-level estimates point in the same direction. A one-standard-deviation increase in the environmental score implies an approximate reduction of 74 basis points, while the corresponding effects are about 31.60 basis points for the social pillar and 23.38 basis points for the governance pillar. Overall, the European results indicate that lenders incorporate ESG information into credit pricing in a broad and economically meaningful way.

By contrast, the US subsample (Models 5–8) shows much weaker pricing effects. Although the coefficients on the aggregate ESG score and the three pillar scores remain negative and statistically significant, they are far smaller in magnitude than those for Europe. In Model 5, the coefficient on the overall ESG score is –0.003, implying that a one-point increase in ESG is associated with only an approximately 0.3% lower loan spread. Using the US mean spread of 150 basis points and the ESG standard deviation of 19.31, a one-standard-deviation increase in ESG corresponds to a reduction of only about 8.69 basis points. Consistent with this modest magnitude, Goss and Roberts (2011) find that firms with CSR concerns incur loan spreads that are 7–18 basis points higher than those of more responsible firms. Taking the median loan amount of US$500 million, this is equivalent to an annual interest-cost saving of about US$0.43 million for a typical loan facility. The implied effects for the environmental, social and governance pillars are similarly modest, at roughly 8.42, 6.50 and 6.33 basis points, respectively. Thus, while ESG appears to contain some pricing-relevant information in the United States, its economic role in syndicated loan pricing is much less pronounced than in Europe.

The cross-regional comparison is also informative at the pillar level. In Europe, the environmental score shows the strongest association with lower spreads, followed by the social and governance dimensions. In the United States, all three pillars are much weaker and economically similar in size. This pattern suggests that ESG information is either more salient to lenders in Europe or more readily translated into pricing decisions there than in the United States. Because the European sample is smaller, these magnitudes should be interpreted with some caution. Even so, the contrast with the United States remains economically striking.

These findings are consistent with institutional theory, which emphasizes that the relevance of non-financial signals such as ESG depends on the surrounding political, regulatory and normative environment (Cheung et al. 2020; A. Hoepner et al. 2016). Europe's syndicated loan market operates within a more comprehensive sustainable finance architecture, underpinned by the EU Taxonomy, the Sustainable Finance Disclosure Regulation (SFDR), and supervisory initiatives such as the ECB's climate stress tests. These frameworks enhance transparency, standardization and comparability of ESG information, thereby increasing lenders' willingness to integrate ESG into credit pricing. In addition, European corporate governance traditions are more stakeholder-oriented and social expectations around sustainability are stronger, which further reinforces the credibility of ESG signals and reduces the risk of greenwashing.

By contrast, the US market remains more fragmented. Federal-level regulation of ESG disclosure is limited; ESG reporting is often voluntary; and the market is more shareholder-centric. These conditions make ESG indicators less salient, leading lenders to place greater weight on conventional financial measures and to treat ESG disclosures with more skepticism, particularly regarding their standardization and materiality. At the same time, a more voluntary and market-driven disclosure environment may make ESG information noisier and less comparable, reducing its incremental value relative to conventional credit metrics.

TABLE 5 | ESG performance and loan spread relationship: Full sample.

	Dependent variable: Log (Spread)							
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
ESG score	−0.0028***				−0.0036***			
	(0.0007)				(0.0012)			
Environmental score		−0.0016***				−0.0019**		
		(0.0005)				(0.0008)		
Social score			−0.0021***				−0.0030***	
			(0.0006)				(0.0010)	
Governance score				−0.0012**				−0.0013
				(0.0005)				(0.0008)
Log (loan amount)	−0.0152	−0.0159*	−0.0148	−0.0159*	0.0129*	0.0129*	0.0129*	0.0126
	(0.0095)	(0.0094)	(0.0095)	(0.0096)	(0.0076)	(0.0076)	(0.0076)	(0.0077)
Log (loan maturity)	0.1148***	0.1162***	0.1141***	0.1150***	0.0633***	0.0638***	0.0628***	0.0635***
	(0.0189)	(0.0189)	(0.0190)	(0.0190)	(0.0158)	(0.0158)	(0.0159)	(0.0159)
Log (# of lenders)	−0.0057	−0.0069	−0.0059	−0.0069	−0.0015	−0.0016	−0.0019	−0.0022
	(0.0160)	(0.0160)	(0.0161)	(0.0162)	(0.0168)	(0.0168)	(0.0168)	(0.0168)
Investment grade	−0.3338***	−0.3317***	−0.3340***	−0.3366***	−0.1410***	−0.1396***	−0.1432***	−0.1432***
	(0.0352)	(0.0350)	(0.0353)	(0.0353)	(0.0439)	(0.0432)	(0.0444)	(0.0439)
Secured	0.3289***	0.3289***	0.3302***	0.3326***	0.0946**	0.0950**	0.0947**	0.0981***
	(0.0283)	(0.0282)	(0.0283)	(0.0289)	(0.0368)	(0.0368)	(0.0368)	(0.0373)
General purpose	−0.1049***	−0.1038***	−0.1061***	−0.1063***	−0.0689***	−0.0685***	−0.0691***	−0.0679***
	(0.0222)	(0.0222)	(0.0223)	(0.0222)	(0.0200)	(0.0201)	(0.0200)	(0.0202)
Revolver	−0.1231***	−0.1233***	−0.1224***	−0.1246***	−0.0775***	−0.0772***	−0.0763***	−0.0774***
	(0.0159)	(0.0159)	(0.0159)	(0.0159)	(0.0124)	(0.0124)	(0.0124)	(0.0123)
Log (assets)	−0.0638***	−0.0667***	−0.0681***	−0.0800***	0.0106	0.0124	0.0111	0.0052
	(0.0126)	(0.0130)	(0.0122)	(0.0122)	(0.0353)	(0.0353)	(0.0352)	(0.0360)
ROA	−0.0123***	−0.0122***	−0.0124***	−0.0126***	−0.0039	−0.0041	−0.0041	−0.0041
	(0.0019)	(0.0020)	(0.0019)	(0.0020)	(0.0027)	(0.0028)	(0.0028)	(0.0027)
Leverage	0.0002***	0.0002***	0.0003***	0.0002***	0.0003***	0.0003***	0.0003***	0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Interest coverage	−0.0011***	−0.0011***	−0.0010***	−0.0011***	−0.0006*	−0.0006*	−0.0006*	−0.0006*
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Borrower FE	No	No	No	No	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	3466	3466	3466	3466	3466	3466	3466	3466
Adj. R^2	0.516	0.515	0.515	0.513	0.755	0.754	0.755	0.754

Note: This table reports regressions where the dependent variable is the natural logarithm of the all-in-drawn loan spread (in basis points). The sample period is 2010-2023. The key explanatory variables are the aggregate ESG score (Model 1 and Model 5) and the Environmental, Social, and Governance scores (Models 2–4 and Models 6–8), measured on a 0-100 scale. Coefficients on the ESG variables can be interpreted approximately as % changes in spread; for example, a coefficient of -0.0028 implies that a one-point increase in the ESG measure is associated with an approximately 0.28% lower spread. All specifications control for loan characteristics—Log (Loan Amount), Log (Loan Maturity), Log (# of Lenders), and indicators for Investment Grade, Secured, General Purpose, and Revolver facilities—and borrower characteristics—Log (Assets), ROA, Leverage, and Interest Coverage. Models 1–4 include industry-year fixed effects; Models 5–8 additionally include borrower fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. Robust standard errors clustered at the borrower level are reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

In sum, the results in Table 6 support Hypothesis H2 by showing that borrower ESG performance is more strongly priced in Europe than in the United States. More broadly, the findings are consistent with institutional theory: the value of ESG as a credit-relevant signal is not uniform across markets, but depends on the regulatory, normative, and disclosure environment in which lending decisions are made.

5 | Robustness Tests

To assess whether the baseline ESG–loan spread relation is robust to plausible competing explanations, we conduct three additional analyses. First, we test whether the results are driven by contemporaneous ESG information by replacing current ESG measures with their 1-year lagged

TABLE 6 | ESG performance and loan spread relationship: Europe versus United States.

	Dependent variable: Log (Spread)							
	Europe				U.S.			
Variable	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**	**Model (7)**	**Model (8)**
ESG score	−0.025**				−0.003***			
	(0.012)				(0.001)			
Environmental score		−0.019***				−0.002**		
		(0.007)				(0.001)		
Social score			−0.009*				−0.002*	
			(0.004)				(0.001)	
Governance score				−0.007**				−0.002**
				(0.003)				(0.001)
Log (loan amount)	−0.038**	−0.042**	0.013	−0.027	0.016*	0.016*	0.015*	0.015*
	(0.018)	(0.018)	(0.029)	(0.019)	(0.009)	(0.009)	(0.009)	(0.009)
Log (loan maturity)	0.240***	0.247***	0.259***	0.267***	0.036**	0.037**	0.036**	0.036**
	(0.051)	(0.048)	(0.061)	(0.045)	(0.016)	(0.016)	(0.017)	(0.017)
# of lenders	0.034	0.022	−0.026	0.028	−0.010	−0.010	−0.010	−0.010
	(0.045)	(0.044)	(0.053)	(0.045)	(0.015)	(0.015)	(0.015)	(0.015)
Investment grade	−0.026	0.030	−0.216*	−0.122	−0.105***	−0.102***	−0.107***	−0.108***
	(0.161)	(0.181)	(0.129)	(0.116)	(0.038)	(0.038)	(0.039)	(0.038)
Secured	0.118	0.094	0.171	0.076	0.075**	0.075*	0.078**	0.080**
	(0.133)	(0.136)	(0.113)	(0.104)	(0.038)	(0.038)	(0.038)	(0.039)
General purpose	−0.197	−0.190	0.031	−0.058	−0.070***	−0.068***	−0.070***	−0.070***
	(0.152)	(0.134)	(0.105)	(0.128)	(0.020)	(0.020)	(0.020)	(0.020)
Revolver	−0.185***	−0.193***	−0.170***	−0.190***	−0.061***	−0.061***	−0.060***	−0.061***
	(0.026)	(0.026)	(0.045)	(0.026)	(0.013)	(0.013)	(0.013)	(0.013)
Log (assets)	−0.866***	−0.815***	0.129	−0.231	−0.014	−0.013	−0.013	−0.020
	(0.267)	(0.248)	(0.155)	(0.182)	(0.035)	(0.035)	(0.035)	(0.036)
ROA	−0.026**	−0.027*	−0.011	0.006	−0.006**	−0.006**	−0.006**	−0.006**
	(0.013)	(0.015)	(0.010)	(0.008)	(0.002)	(0.002)	(0.003)	(0.002)
Leverage	0.001***	0.001**	0.001***	0.001**	0.0002***	0.0002***	0.0002***	0.0002***
	(0.0005)	(0.0005)	(0.0002)	(0.0003)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Interest coverage	0.035***	0.024**	–0.008	–0.011**	–0.001	–0.0005	–0.0005	–0.001
	(0.012)	(0.012)	(0.005)	(0.005)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	518	518	518	518	2572	2572	2572	2572
Adj. R^2	0.874	0.876	0.745	0.843	0.746	0.746	0.745	0.746

Note: This table reports separate regressions for Europe (Models 1–4) and the United States (Models 5–8), where the dependent variable is the natural logarithm of the all-in-drawn loan spread (in basis points). The sample period is 2010–2023. The key explanatory variables are the aggregate ESG score (Models 1 and 5) and the Environmental, Social, and Governance pillar scores (Models 2–4 and 6–8), measured on a 0–100 scale. Coefficients on the ESG variables can be interpreted approximately as % changes in spread; for example, a coefficient of –0.025 implies that a one-point increase in the ESG measure is associated with an approximately 2.5% lower spread. All specifications control for loan characteristics—Log (Loan Amount), Log (Loan Maturity), Log (# of lenders), and indicators for Investment Grade, Secured, General Purpose, and Revolver—and borrower characteristics—Log (Assets), ROA, Leverage, and Interest Coverage. All models include industry-year and borrower fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. Robust standard errors clustered at the borrower level are reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

values. Second, we examine whether the findings are attributable only to sustainability-labelled lending by re-estimating the models after excluding SCLs. Third, we assess whether ESG pricing differs across regulatory periods and regions by interacting borrower ESG measures with a Post-Paris indicator separately for Europe and the United States. Together, these analyses evaluate the sensitivity of the main findings to temporal ordering, sample composition and post-2015 institutional salience.

5.1 | Addressing Reverse Causality

Table 7 addresses concerns about reverse causality and simultaneity by replacing contemporaneous ESG measures with their 1-year lagged values relative to loan origination. This specification relates loan spreads in year t to ESG information observed before the loan, thereby reducing the possibility that contemporaneous loan pricing and ESG scores are jointly determined. The results show that lagged aggregate ESG

TABLE 7 | Addressing reverse causality in ESG performance and loan spread.

	Dependent variable: Log (Spread)			
Variable	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
ESG score $_{t-1}$	−0.011**			
	(0.005)			
Environmental score $_{t-1}$		−0.004		
		(0.004)		
Social sScore $_{t-1}$			−0.009*	
			(0.005)	
Governance score $_{t-1}$				−0.008***
				(0.003)
Loan level controls	Yes	Yes	Yes	Yes
Borrower level controls	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Obs.	715	715	715	715
Adj. R^2	0.850	0.847	0.849	0.850

Note: This table reports regressions of the natural logarithm of the all-in-drawn loan spread (in basis points) on lagged Refinitiv ESG measures. The sample period is 2010–2023. The key explanatory variables are the aggregate lagged ESG score$_{t-1}$_(Model 1), Environmental score$_{t-1}$ (Model 2), Social score $_{t-1}$ (Model 3) and Governance score $_{t-1}$ (Model 4); measured on a 0–100 scale. Coefficients on the ESG variables can be interpreted approximately as % changes in spread; for example, a coefficient of −0.011 implies that a one-point increase in the ESG measure is associated with an approximately 1.1% lower spread. Each model includes one lagged ESG measure at a time. All specifications control for loan characteristics—Log (Loan Amount), Log (Loan Maturity), Log (Number of Lenders) and indicators for Investment Grade, Secured, General Purpose and Revolver facilities—and lagged borrower characteristics—Log (regressions include borrower fixed effects, and Industry-Year fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. Robust standard errors clustered at the borrower level are reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

remains negatively and significantly associated with loan spreads. A one-standard-deviation increase in ESG corresponds to an implied reduction of about 32.52 basis points, which is equivalent to an approximate annual interest saving of about US $1.63 million for a typical loan facility. At the pillar level, the negative association persists for the Social and Governance scores, whereas the Environmental score is statistically insignificant. With borrower fixed effects included, identification comes from within-borrower changes in ESG over time, making the findings more consistent with the view that prior ESG improvements are associated with lower subsequent borrowing costs.

5.2 | Sub-Sample Analysis Excluding SCLs

Table 8 reports whether the baseline ESG–loan spread relation is driven solely by labelled SCLs. The results show that the main findings remain broadly robust after excluding SCLs from the sample. In Model 1, the coefficient on the aggregate ESG score is negative and statistically significant, indicating that the inverse ESG–spread relation persists outside labelled SCL facilities. A one-standard-deviation increase in ESG corresponds to an implied reduction of about 9.62 basis points, which is equivalent to an annual interest saving of about US$ 0.38 million for a typical facility. Models 2 and 3 report similarly negative and significant coefficients for the Environmental and Social pillars, whereas the Governance coefficient remains negative but statistically insignificant. Overall, these findings suggest that the pricing relevance of borrower ESG is not confined to labelled SCL loan contracts but extends to the broader conventional syndicated loan market.

5.3 | Paris Agreement Effect

We next examine whether the institutional contrast between Europe and the U.S. became more pronounced after the Paris Agreement. If ESG pricing depends on the broader political commitment and regulatory environment, the post-Paris period should more clearly strengthen the ESG–spread relationship in jurisdictions where climate commitments were more rapidly translated into disclosure expectations, supervisory pressure, and sustainable finance policy.

Table 9 examines whether the ESG–spread relation differs after the Paris Agreement by interacting borrower ESG measures with a Post-Paris indicator. For European borrowers, the interaction terms are negative and statistically significant for the aggregate ESG score and the Environmental and Social pillars, indicating that the inverse ESG–spread relationship strengthened after 2015. In contrast, the corresponding interaction terms for US borrowers are statistically insignificant across all ESG dimensions, suggesting little evidence of a comparable Post-Paris shift in ESG pricing. Overall, the results provide suggestive evidence that the post-2015 strengthening in ESG pricing was concentrated in Europe rather than the United States. However, these findings should be interpreted with caution, as a strictly balanced-borrower pre/post-design is not feasible without a substantial loss of observations.

TABLE 8 | ESG performance and loan spread: Excluding sustainable corporate loans.

	Dependent variable: Log (Spread)			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
ESG score	–0.0032**			
	(0.0012)			
Environmental score		–0.0019**		
		(0.0008)		
Social score			–0.0024**	
			(0.0011)	
Governance score				–0.0011
				(0.0009)
Loan level controls	Yes	Yes	Yes	Yes
Borrower level controls	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Obs.	3315	3315	3315	3315
Adj. R^2	0.757	0.752	0.752	0.752

Note: This table reports regressions of the natural logarithm of the all-in-drawn loan spread (in basis points) on ESG measures, using a sample (2010–2023) that excludes the sustainable corporate loans. The key explanatory variables are the aggregate ESG Score (Model 1), Environmental Score (Model 2), Social Score (Model 3) and Governance Score (Model 4), measured on a 0–100 scale. Coefficients on the ESG variables can be interpreted approximately as % changes in spread; for example, a coefficient of –0.0032 implies that a one-point increase in the ESG measure is associated with an approximately 0.32% lower spread. The sample All specifications control for loan characteristics— Log (Loan Amount), Log (Loan Maturity), Log (# of Lenders), and indicators for Investment Grade, Secured, General Purpose, and Revolver facilities—and borrower characteristics— Log (Assets), ROA, Leverage and Interest Coverage. All regressions include borrower fixed effects and Industry-Year fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. Robust standard errors clustered at the borrower level are reported in parentheses. ** denotes statistical significance at the 5% level.

The intensified post-Paris ESG pricing in Europe further supports the view that regulatory developments play a critical role in shaping lender behavior. Beyond differences in financial regulation, cross-region heterogeneity can reflect political commitment and credibility of the transition regime. Where climate policy is time-consistent and institutionally entrenched, borrower ESG performance is a more credible proxy for exposure to transition risk and for the likelihood of benefiting from the low-carbon transition. Lenders can then rationally incorporate ESG performance into pricing and contract design. In contrast, where climate policy and the Paris commitment are politically contested and subjected to reversals, the expected policy path is more uncertain (e. g., in the United States), and lenders may ignore ESG information in pricing. This political channel is plausibly stronger in the United States, where climate policy has exhibited discontinuities around Paris participation, whereas the EU has embedded decarbonization targets into a legal framework, strengthening the credibility of the transition trajectory.

6 | Conclusion

This article examines whether and how banks price corporate ESG performance in the syndicated loan market, using a sample of global loans between 2010 and 2023. Drawing on the risk-mitigation view and institutional theory, we test the relationship between borrower ESG scores and loan spreads across environmental, social and governance dimensions, and whether these effects differ between European and US contexts.

The results reveal a statistically significant negative relationship between ESG performance and loan spreads. Firms with stronger ESG profiles are consistently rewarded with lower borrowing costs, with the effect driven mainly by the environmental and social dimensions. These findings remain robust after controlling for borrower and industry-year fixed effects, suggesting that ESG contains pricing-relevant information beyond conventional credit variables. In economic terms, the effect is non-trivial: a one-standard-deviation increase in aggregate ESG is associated with an approximately 10.64-basis-point reduction in loan spread, equivalent to an annual interest saving of about US$0.41 million for a typical facility. However, the governance pillar is weaker and less robust, indicating that not all ESG dimensions are equally informative for lenders once standard credit controls are taken into account.

This article contributes to the literature in three ways. First, it adds evidence from private debt markets by showing that ESG performance matters not only for public debt and equity valuation but also for syndicated bank lending. Second, it disentangles the aggregate ESG effect into its environmental, social and governance components, showing that environmental and social performance account for most of the pricing relevance. Third, it provides a direct comparison between Europe and the United States within a unified empirical setting and shows that regional institutional differences help explain variation in ESG pricing.

The findings also carry practical implications. For corporate borrowers, the results suggest that stronger environmental and social performance can yield tangible financing benefits

TABLE 9 | ESG performance and loan spread relationship around Paris Agreement: Europe versus United States.

	Dependent variable: Log (Spread)							
	Europe				United States			
Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
ESG score	−0.004				−0.003***			
	(0.015)				(0.001)			
Environmental score		−0.018**				−0.002**		
		(0.007)				(0.001)		
Social score			0.013				−0.003**	
			(0.009)				(0.001)	
Governance score				0.006				−0.001
				(0.007)				(0.001)
ESG score × Post-Paris	−0.027***				0.001			
	(0.008)				(0.001)			
Environmental score × Post-Paris		−0.017***				0.0003		
		(0.006)				(0.001)		
Social score × Post-Paris			−0.045***				0.001	
			(0.011)				(0.001)	
Governance score × Post-Paris				−0.008				−0.001
				(0.005)				(0.001)
Loan level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	518	518	518	518	2,572	2,572	2,572	2,572
Adj. R^2	0.879	0.879	0.889	0.872	0.746	0.745	0.745	0.746

Note: This table reports separate regressions for Europe (Models 1–4) and the United States (Models 5–8), where the dependent variable is the natural logarithm of the all-in-drawn loan spread (in basis points) for syndicated loan facilities. Sample period is 2010–2023. The key explanatory variables are the aggregate ESG score (Models 1 and 5) and the Environmental, Social and Governance pillar scores (Models 2–4 and 6–8); measured on 0–100 scale. Coefficients on the ESG variables can be interpreted approximately as % changes in spread; for example, a coefficient of –0.003 implies that a one-point increase in the ESG measure is associated with an approximately 0.30% lower spread. Each specification includes one ESG measure and its interaction with a Post-Paris indicator (equal to 1 for facilities originated in 2016 and later, and 0 for facilities originated up to 2015), capturing differential ESG pricing after the Paris Agreement. The main effect of Post-Paris is not separately identified because year fixed effects absorb common time shocks. All models control for loan characteristics—Log (Loan Amount), Log (Loan Maturity), Log (# of Lenders) and indicators for Investment Grade, Secured, General Purpose and Revolver facilities—and borrower characteristics—Log (Assets), ROA, Leverage and Interest coverage. All specifications include industry-year, and borrower fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. Robust standard errors clustered at the borrower level are reported in parentheses. *** denotes statistical significance at the 1% level.

through lower loan spreads, especially in markets where ESG information is more credible and decision-useful. For banks, the evidence indicates that ESG information can improve lending decisions when used as a complement to traditional credit assessment rather than as a substitute. Environmental and social indicators appear to capture aspects of transition risk, operational vulnerability, reputational exposure and borrower resilience that are not fully reflected in standard financial metrics. For regulators and policymakers, the findings underline the importance of strong political commitment and institutional support for ESG disclosure and integration. While global agreements like the Paris Agreement help establish minimum standards, their effectiveness in influencing market pricing depends on domestic regulatory implementation and market readiness. Thus, ESG pricing in credit markets may be strengthened by harmonizing regulatory frameworks, enhancing the quality of ESG disclosures and supporting ESG capacity building within corporations, leading to a sustainable future.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The syndicated loan data used in this study are obtained from Refinitiv DealScan via the Wharton Research Data Services (WRDS) platform, while firm-level financial and ESG information are sourced from Refinitiv Datastream and Refinitiv ESG. These datasets are proprietary and accessible through institutional subscription agreements. The

replication codes and supporting documentation necessary to reproduce the main results are available from the corresponding author upon reasonable request.

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