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ESG score and cost of debt: Evidence from Indonesia

Valentine Siagian^{1*}, Judith Tagal Gallena Sinaga¹ and Nensy Dwi Putri Sinaga²**Abstract**

Research aims: This study explores the influence of Environmental, Social, and Governance (ESG) practices on corporate debt costs. The primary objective is to determine whether comprehensive ESG adherence can function as a mechanism to reduce financial liabilities by lowering borrowing costs.

Design/Methodology/Approach: The research employs a quantitative methodology, using a dataset of ESG scores from 635 firm-year observations in Indonesian data covering 2013-2022, and analyzes it using OLS regression. The analytical approach involves comparing corporate debt costs with overall ESG scores and with the disaggregated ESG scores independently.

Research findings: ESG scores are associated with lower debt costs. However, when the components are analyzed separately, only the Governance score shows a statistically significant negative correlation with debt costs. Environmental and Social scores do not demonstrate a meaningful standalone effect. It suggests that creditors place greater emphasis on governance-related factors in assessing credit risk.

Theoretical contribution/Originality: This study makes a significant contribution to the literature on sustainable finance by providing empirical evidence of the differential impact of ESG components on corporate financing costs. It advances understanding of how ESG factors, particularly governance, shape firms' financial outcomes.

Practitioner/Policy implication: The results highlight the strategic importance of governance-focused ESG initiatives for firms seeking to lower financing costs. Policymakers and corporate strategists should recognize the value creditors place on governance practices and incorporate this insight into ESG frameworks and disclosure standards.

Keywords: ESG scores; Cost of Debt; Firm Liabilities

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Introduction

The global focus on fostering sustainable development is positively impacting industries, as companies integrate practices that prioritize their sustainability frameworks. As Ma (2023) points out, Environmental, Social, and Governance (ESG) investing is gaining traction worldwide and is becoming a mainstream component of investment decision-making, encouraging responsible business practices alongside growth. Baratta et al. (2023) note that businesses aim to implement ESG practices to comply with the UN's SDGs and legal requirements, as well as to meet stakeholder demands.

Additionally, the adoption of ESG approaches is expected to enhance business sustainability and corporate image, particularly as legislation increasingly supports ESG policies (Mazhorina, 2022). ESG is a set of criteria that serves as a framework for how investors assess a company's value and evaluate its performance (Jin, 2023; Lee, 2023). Landi and Sciarelli (2019) examined the impact of ESG ratings on corporate financial performance in Italy, with a particular focus on the perspective of socially responsible investors. Their findings suggest that ESG ratings do more than measure corporate responsibility—they provide investors with valuable insights into a company's ethical conduct, which in turn affects abnormal returns and signals a strong commitment to social values. Similarly, Giese et al. (2019) demonstrated that ESG factors play a crucial role in equity valuation, risk assessment, and overall financial performance. Their research highlights how ESG data can serve as a meaningful indicator of financial stability and future profitability, shaping how investors perceive risk and value. More recently, Tantawy (2023) demonstrated that, in Egyptian firms, strong ESG performance tends to predict better financial outcomes, with investors' perceptions of ESG performance influencing these outcomes. This global trend is also evident in Indonesia, where sustainability considerations are increasingly influencing financial institutions' decisions. Lenders, in particular, are factoring ESG into their risk assessments, which directly affects the cost of debt for businesses operating in the country (Apergis et al., 2022; Baratta et al., 2023).

Indonesia, a country with emerging-market status and a growing focus on sustainability, has made ESG practices increasingly important. The nation faces significant environmental challenges, including deforestation, frequent natural disasters, and industrial pollution—factors that underscore the urgency of integrating ESG considerations into business practices (Raimo et al., 2021; Baratta et al., 2023). Furthermore, persistent social and governance concerns such as income inequality, labor rights violations, and corruption have intensified the demand for corporate accountability. These realities have prompted financial institutions to include ESG scores in their assessment of borrowers' risk profiles, directly influencing the cost of debt for Indonesian firms.

The link between ESG scores and the cost of debt is crucial in this context, as it determines how corporate sustainability efforts translate into financial outcomes. Companies with strong ESG performance are generally perceived by lenders as lower-risk borrowers, which often results in reduced financing costs. Conversely, firms with weaker ESG profiles may face higher borrowing costs due to an elevated perceived risk (Apergis et al., 2022; Arora & Sharma, 2022). This dynamic is particularly relevant for Indonesia, where sustainable development is crucial to achieving long-term economic progress. By embedding ESG factors into lending criteria, banks and investors can simultaneously promote responsible business conduct and protect their financial interests.

The primary objective of this study is to investigate the impact of ESG scores on the cost of debt among Indonesian companies and to compare these findings with global patterns. Through empirical analysis, the study aims to either substantiate or challenge prevailing claims made by international literature, thereby offering a more contextualized understanding of how ESG factors influence financial performance in emerging markets.

Recent global research has increasingly investigated the financial implications of ESG adoption. For example, Gigante and Manglaviti (2022) and Eliwa et al. (2019) have explored how ESG performance affects access to credit and the cost of debt across different geographical regions, generally finding that higher ESG scores correspond to lower borrowing costs. However, studies specifically focusing on Indonesia remain scarce, highlighting a critical research gap this study seeks to address, particularly since ESG regulations and implementation in Indonesia are still at an early stage, with the Financial Services Authority (FSA) only recently mandating sustainability reporting for listed companies and banks following POJK No.51/2017. While some large corporations have begun integrating ESG principles, adoption across industries remains inconsistent, reflecting challenges in regulatory enforcement, data transparency, and corporate commitment.

Additional insights from Apergis et al. (2022) demonstrate a strong connection between higher ESG scores and reduced borrowing costs at the global level, attributing this to lower perceived credit risk. Their findings suggest that robust ESG performance can mitigate risks related to environmental degradation, social unrest, and governance failures—risks that otherwise elevate the likelihood of default. Consequently, firms that invest in ESG practices may be rewarded with more favorable financing conditions, reinforcing the strategic value of sustainability.

This study is driven by the need to understand how Indonesian companies integrate ESG into their operations and the financial impact of this integration. Given Indonesia's distinctive ESG landscape—shaped by environmental vulnerability, socio-political challenges, and regulatory dynamics—there is a pressing need to evaluate whether ESG adoption can reduce capital costs and enhance reputational capital, as proposed by Maaloul et al. (2023) and Hou and Zhang (2023).

While global studies, such as those by Apergis et al. (2022), offer valuable general insights, their findings may not fully apply to Indonesia's unique financial and regulatory environment. Prior studies that rely on S&P500 firms typically draw on large, mature corporations operating in highly liquid capital markets with relatively strong disclosure standards, well-developed investor protections, and robust ESG reporting practices. In contrast, this study employs Indonesian data, where listed firms are often smaller in scale, operate within less liquid and more volatile financial markets, and face evolving but unevenly enforced ESG regulations (e.g., FSA POJK No. 51/2017 and POJK No. 18/2023). These structural differences—ranging from firm size, governance quality, and capital market development to regulatory oversight and ESG disclosure practices—raise doubts about the direct comparability of findings across contexts. Consequently, evidence from developed markets, such as the U.S., may underestimate the challenges and risks of ESG integration in emerging economies like Indonesia. Variations in market maturity, policy enforcement, and stakeholder expectations necessitate a localized investigation. Understanding how these factors influence the cost of debt in Indonesia is crucial for both corporate decision-makers and investors seeking to navigate the evolving landscape of sustainable finance. Beyond its empirical contribution, this study also engages with the broader theoretical conversation around ESG and financial performance in emerging

markets. It offers a nuanced framework for assessing how ESG practices shape borrowing conditions and encourages future research to explore the diverse ways local contexts influence the financial and social returns of sustainable corporate behavior.

Literature Review and Hypotheses Development

Stakeholder Theory

Stakeholder theory suggests that a company's long-term success depends not only on satisfying shareholders but also on addressing the needs and expectations of a broader group of stakeholders—such as employees, suppliers, communities, and regulators (Freeman, 1984). This broader view of corporate responsibility aligns naturally with ESG principles, which emphasize balancing these varied interests. By doing so, companies can strengthen their reputation, improve risk management, and ultimately influence their financial standing. Specifically, in the context of ESG and the cost of debt, stakeholder theory helps explain how effectively managing stakeholder relationships through strong ESG practices can reduce lenders' perceived risk. When lenders observe that a company is committed to responsible and inclusive governance, they are more likely to view it as a lower-risk borrower, resulting in lower borrowing costs (La Rosa et al., 2018; Izzo & Magnanelli, 2012).

ESG Practice

Indonesia's regulatory framework for ESG practices has undergone significant evolution in recent years under the supervision of the Financial Services Authority (FSA). A pivotal milestone was POJK No. 51/2017, which requires financial institutions, issuers, and listed companies to prepare Sustainable Finance Action Plans and publish annual Sustainability Reports, embedding ESG into corporate governance and financial decision-making. Complementing this, POJK No. 60/2017 introduced rules on green bond issuance, mandating that proceeds finance environmentally friendly projects and be externally verified. In 2023, the scope was broadened through POJK No. 18/2023, which replaced the green bond rule with a comprehensive framework covering green, social, and sustainability bonds and sukuk, as well as sustainability-linked instruments, aligning Indonesia with international practice. To guide capital flows, Indonesia launched a Green Taxonomy in 2022. It expanded it into the Indonesia Taxonomy for Sustainable Finance (TKBI) Version 2 in 2025, offering sector-specific screening criteria and alignment with ASEAN. Parallel developments include the IDX ESG Leaders Index and the SRI-KEHATI Index, which aim to promote investor awareness of high-ESG firms. However, implementation remains uneven, with gaps in data quality and assurance, and ongoing debates about "transition" activities. These dynamics underscore the need for empirical evidence on the financial implications of ESG in Indonesia.

As a rapidly developing country endowed with rich natural resources, Indonesia faces both distinct challenges and promising opportunities in implementing ESG practices. The nation's ESG approach is shaped by a complex interplay of environmental diversity,

evolving social conditions, and unique governance structures, all of which are influenced by global pressures and domestic realities. In response to these dynamics, the Indonesian government has set an ambitious target: to generate 23% of the national energy mix from renewable sources by 2025, according to Climate Transparency (2024). This target is being pursued through the development of geothermal, solar, and wind energy infrastructure, capitalizing on the country's vast archipelagic potential. However, advancing ESG practices in Indonesia requires a delicate balance between sustaining economic growth and achieving long-term sustainability goals. While considerable progress has been made—particularly among large corporations and entities with access to international capital—small and medium-sized enterprises (SMEs) often struggle to adopt ESG principles due to limited financial and technical capacity.

Nonetheless, there are significant opportunities to accelerate ESG adoption across sectors. These include capitalizing on Indonesia's rich biodiversity to promote eco-tourism, fostering the development of green technologies, and encouraging inclusive growth strategies that yield social and environmental benefits beyond the firm level. International collaborations and investments play a vital role in this effort, serving as conduits for knowledge transfer and capacity building, which are essential to implementing more advanced ESG strategies. Significantly, these ESG-driven initiatives not only contribute to sustainable development but also affect financial outcomes, particularly corporate borrowing costs. Numerous studies have demonstrated that robust ESG performance can lead to more favorable debt financing conditions, underscoring the strategic value of integrating sustainability within business operations (Raimo et al., 2021; Zhang, 2021; Lavin & Montecinos-Pearce, 2022; Arora & Sharma, 2022).

Cost of Debt

ESG practices can significantly influence a company's cost of debt. These effects emerge through multiple channels shaped by how investors, lenders, and other stakeholders assess a company's prospects and associated risks. Generally, firms with strong ESG credentials are perceived as lower-risk by creditors. This perception is grounded in the belief that such companies are better managed, more transparent, and more resilient in the face of crises or controversies.

A strong ESG profile often enhances a company's reputation, translating into greater trust from lenders and more favorable borrowing conditions. Firms that perform well in ESG also tend to encounter regulatory hurdles, which reduces the risk of non-compliance and associated financial penalties or operational disruptions. For lenders, these factors are critical in assessing default risk. In jurisdictions with strict environmental regulations, companies that consistently comply are viewed as less likely to incur unforeseen costs, thereby improving their financial stability (Sengupta, 1998; Elyasiani et al., 2010).

Investor interest is also growing in debt instruments issued by ESG-aligned firms. Bonds issued by such companies often attract more demand, allowing them to offer lower yields and thereby reduce their overall borrowing costs. Notably, green bonds—designed to finance environmentally focused projects—are often issued at a premium, driven by

investors' desire to support sustainable initiatives. This dynamic makes ESG-compliant companies more competitive in capital markets than those issuing traditional bonds.

Beyond access to capital, ESG practices also promote more effective resource management. Companies committed to sustainability often adopt strategies that reduce energy consumption, minimize waste, and lower operational costs. These efficiencies can improve profitability and financial stability—key indicators that appeal to creditors evaluating long-term risk (Dhorausigam Samuel et al., 2022).

In a broader context, companies that demonstrate a commitment to long-term sustainability are viewed as better equipped to address future challenges, including those related to climate change. This forward-thinking orientation enhances their appeal to lenders seeking secure, long-term returns. Ultimately, ESG practices affect the cost of debt through multiple mechanisms: by altering risk perceptions, improving regulatory compliance, enhancing corporate reputation, and ensuring operational resilience. For businesses in Indonesia and around the world, ESG is no longer just a matter of compliance or ethics—it is increasingly a strategic imperative. Integrating ESG principles into business operations is becoming essential to achieving both financial competitiveness and operational success (Tereschenko et al., 2021; Lourenço & Oliveira, 2017; Valta, 2012).

ESG Practices and Cost of Debt

A growing body of research indicates that ESG practices can help companies reduce their cost of debt by enhancing transparency, mitigating information asymmetry, and aligning corporate behavior with lenders' expectations for sustainable and responsible operations. For instance, firms with strong ESG performance in the European Union have been shown to enjoy reduced debt costs, as ESG disclosures provide lenders with assurance regarding the firm's long-term commitment to sustainability (Eliwa et al., 2019). Similar outcomes have been reported in China, where companies with robust ESG frameworks tend to attract more investor attention, ultimately resulting in lower borrowing costs (Zhou, 2023). The effect is even more pronounced in high-pollution industries, where firms with higher ESG ratings often secure cheaper debt, especially when their sustainability efforts are paired with green innovations (Hou & Zhang, 2023). These findings suggest that adopting ESG principles can serve as a strategic advantage for firms seeking favorable financing terms—particularly in emerging markets and environmentally intensive sectors. However, the relationship between ESG and the cost of debt is not always straightforward. While many studies suggest a positive link, other research has found that this effect is inconsistent across all regions and industries. For example, some European studies have noted that while high ESG ratings may improve corporate transparency, they do not always result in lower debt costs in practice (Eliwa et al., 2019). Research on Latin American firms also yields mixed results, suggesting that ESG disclosures can sometimes be associated with higher financing costs, especially when firms pursue aggressive growth strategies, which lenders may perceive as riskier (Lavín & Montecinos-Pearce, 2022).

Additionally, findings from the European energy sector indicate that while ESG performance may contribute to lower equity financing costs, its impact on debt financing remains limited. It suggests that the financial benefits of ESG initiatives can vary significantly depending on the specific financial instrument used and the regional and sectoral context in which a company operates (Gonçalves et al., 2022). Based on this discussion, the hypothesis proposed is:

H₁: A Higher ESG score will significantly lower the cost of debt.

H₂: A Higher Environmental score will significantly lower the cost of debt.

H₃: A Higher Social score will significantly lower the cost of debt.

H₄: A Higher Governance score will significantly lower the cost of debt.

Research Method

Following previous literature, we study the changes in the Cost of Debt by using these estimations partially:

$$COD_{i,t+1} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 BSize_{i,t} + \beta_3 FSize_{i,t} + \beta_4 ROA_{i,t} + \varphi t + \varepsilon \dots\dots\dots (1)$$

$$COD_{i,t+1} = \beta_0 + \beta_1 Env_{i,t} + \beta_2 BSize_{i,t} + \beta_3 FSize_{i,t} + \beta_4 ROA_{i,t} + \varphi t + \varepsilon \dots\dots\dots (2)$$

$$COD_{i,t+1} = \beta_0 + \beta_1 Sos_{i,t} + \beta_2 BSize_{i,t} + \beta_3 FSize_{i,t} + \beta_4 ROA_{i,t} + \varphi t + \varepsilon \dots\dots\dots (3)$$

$$COD_{i,t+1} = \beta_0 + \beta_1 Gov_{i,t} + \beta_2 BSize_{i,t} + \beta_3 FSize_{i,t} + \beta_4 ROA_{i,t} + \varphi t + \varepsilon \dots\dots\dots (4)$$

COD is the cost of debt, measured by interest expense divided by average debt. ESG is measured by the total ESG scores and by separate ESG index scores from Bloomberg. We use BoardSize as the total number of board members, FirmSize as the natural logarithm of total assets, and ROA as net income divided by total assets as control variables. To control for unobserved firm-specific factors, we use a fixed-effect model with year dummies (φt) to capture time-invariant factors that affect all firms.

Data

In this paper, we study the firms listed on the Indonesia Stock Exchange. We use panel data taken from the firm's annual reports for the period 2013-2022. The data was obtained from the Bloomberg database, which covers firms with ESG scores and all necessary accounting data.

Table 1 Purposive Sampling

No	Criteria	Sample
1.	Unique firms with ESG scores from 2013-2022	103
2.	Total population for the 10-year sample period	1.030
3.	Less: sample firms with missing and incomplete data	395
4.	Total sample	635

Table 1 presents the purposive sampling and the final sample size used in this paper. There are 103 unique firms with ESG scores, resulting in a 1,030-firm-year population. There are firms with missing data and incomplete data, resulting in a sample of 635 firm-year observations from 75 unique firms. Table 2 provides the definitions of all variables used in this research.

Table 2 Variable Definition and Measurement

Variables	Measurement
Cost of Debt (COD)	Interest expense/average debt
ESG Scores (ESG)	ESG scores
Environmental Disclosure (ENV)	Environmental score from firm <i>i</i> at time <i>t</i>
Social Disclosure (SOC)	Social score from firm <i>i</i> at time <i>t</i>
Governance Disclosure (GOV)	Governance score from firm <i>i</i> at time <i>t</i>
Board Size (BSIZE)	Number of board members (board of commissioners and board of directors) from firm <i>i</i> at time <i>t</i>
Firm Size (FSIZE)	Natural logarithm of total assets
Return on Assets (ROA)	Net Income/total assets from firm <i>i</i> at time <i>t</i>

Difference in difference

Endogeneity remains a significant challenge in corporate governance research, particularly when examining its impact on the cost of debt (Eliwa et al., 2019). This concern is equally relevant in sustainability studies, where establishing clear causal links between variables is often complicated by mutual influences and the omission of variables. In particular, the relationship between ESG factors and the cost of debt can be obscured by endogeneity. For example, firms with lower borrowing costs might be more inclined or better positioned to invest in ESG initiatives, making it difficult to determine the direction of causality (Coles et al., 2012; Wu, 2023). Addressing endogeneity is therefore essential to ensure the robustness and validity of findings in this field. Specifically, the unobserved variable may simultaneously influence ESG performance and the cost of debt. However, identifying an instrumental variable that correlates with ESG performance but is not associated with firm performance remains a challenge. To address these concerns, we adopt the natural-experimental approach outlined by Coles et al. (2014).

We exploit a regulatory intervention by FSA in 2017, which mandated that all publicly listed firms in Indonesia disclose their environmental performance. This policy shift, which took effect in 2018, serves as the basis for identifying exogenous variation in ESG performance. Firms classified as noncompliant with pre-FSA environmental reporting standards were also required to report the ESG score (Nikolaev & Van Lent, 2005; Eichholtz et al., 2019). This regulatory change induced an exogenous increase in ESG scores, providing a natural experiment framework. Following Coles et al. (2014), we adapt the difference-in-differences (DID) methodology introduced by Bertrand and Mullainathan (2003). Specifically, our focus is on disentangling the causal impact of FSA rules on firm performance and the channels through which ESG influences firm outcomes. To isolate the so-called "clean" ESG effect, we modify the standard DID specification.

In a conventional DID framework, the dependent variable is regressed on three main variables: a Post-FSA dummy (equal to 1 for years 2018 and beyond, and 0 otherwise), a Noncompliant dummy (equal to 1 for firms not in compliance with pre-FSA requirements, and 0 otherwise), and their interaction term (Post-FSA x Noncompliant). The coefficient on the interaction term captures the differential effect of the regulation for noncompliant firms in the post-FSA period. Importantly, ESG is excluded as a control variable in this setup to ensure that the interaction coefficient captures both the direct regulatory impact and the ESG-driven changes in cost of debt. This approach enables us to isolate the causal pathways resulting from ESG improvements triggered by regulatory mandates. To estimate the effect of ESG, we run the modified regression, which includes ESG and the interaction of ESG with the three dummy variables:

$$COD_{i,t+1} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 POST-FSA \times ESG_{i,t} + \beta_3 Non\ Compliance \times ESG_{i,t} + \beta_4 POST-SOX \times ESG_{i,t} \times Non\ Compliance + \beta_5 POST-SOX + \beta_6 Non\ Compliance + \beta_7 BSize_{i,t} + \beta_8 FSize_{i,t} + \beta_9 ROA_{i,t} + \varphi t + \varepsilon \dots\dots\dots (5)$$

Result and Discussion

Descriptive Statistics

Table 3 Descriptive statistics drawn from 635 firms over the year of observation during 2013-2022.

Table 3 Descriptive Statistics

Variable	N	Min	Max	Mean	Std. Deviation
COD	635	-671	1191	33.93	100.34
ESG	635	0	73.87	35.11	11.94
Env	635	0	78.07	14.37	17.19
Social	635	0	58.62	21.04	13.68
Gov	635	0	98.62	67.35	13.23
Bsize	635	2	14	6	2.28
Fsize	635	6.04	14.43	11.77	12.55
ROA	635	-48.15	55.73	4.38	7.30

ESG scores, encompassing overall sustainability and governance practices, range from 0 to 73.87 with a mean score of 35.11, indicating varying degrees of commitment to ESG practices among firms. Environmental and Social scores range from 0 to 78.07 and 58.62, respectively, indicating that some firms are highly engaged in environmental and social activities, while others are not. Governance practices among firms vary substantially, with scores ranging from 0 to 98.62. Board Size and Firm Size exhibit natural variations in the structure and scale of the companies, with Board Size ranging from 2 to 14 members and Firm Size values indicating, perhaps, revenues or assets, spanning from \$6.04 to \$14.43. ROA, an indicator of profitability, varies from -48.15 to 55.73, highlighting a broad spectrum of operational efficiencies among the sampled firms.

Hypothesis Testing

Table 4 presents the regression results assessing the impact of Environmental, Social, and Governance (ESG) scores on the cost of debt, while controlling for board size (BoardSize), firm size (FSize), and return on assets (ROA). ESG scores show a negative relationship with the cost of debt. In Model (1), the coefficient is -1.04, significant at the 1% level, indicating that higher ESG scores are associated with a lower cost of debt. *In Model (2), while the magnitude of the ESG impact decreases to -0.49, it remains significant at the 5% level.* Model (1) achieves an adjusted R-square of 0.08, indicating a modest explanatory power. Model (2), with additional variables, shows a slightly lower adjusted R-squared of 0.01, suggesting that adding board size, firm size, and ROA does not significantly improve the model's fit. The results indicate a significant negative relationship between ESG scores and the cost of debt, supporting the notion that firms with higher ESG scores tend to benefit from lower borrowing costs. Additionally, board size significantly reduces debt costs, likely because it improves corporate governance. However, the impact of firm size and ROA on the cost of debt appears less pronounced.

Table 4 ESG and Cost of Debt

Constanta	57.85 ^{***} (3.38)	112.7 ^{**} (4.89)
ESG	-1.04 ^{***} (-2.69)	-0.49 ^{**} (-1.07)
BoardSize		-6.22 ^{***} (-2.78)
FSize		-0.01 (-0.65)
ROA		-3.75 [*] (-5.80)
N	635	635
Year Fixed Effect	Yes	Yes
Adjusted R-Square	0.08	-0.01

Each cell shows the coefficient estimate of the explanatory variable, followed (in parentheses) by its *t*-statistic. ^{***}, ^{**}, and ^{*} indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

To make it easier to compare, this study report the base case regression (model 2 of Table 4, models 2, 4, 6 of Table 5).

Table 5 Environmental, Social, and Governance Scores to Cost of Debt

Constanta	32.72*** (2.26)	104.4*** (4.82)	36.63*** (2.50)	104.6*** (4.77)	68.28*** (2.88)	136.1*** (4.39)
Env	-0.05 (-0.20)	0.194 (0.71)				
Social			-0.506 (-1.51)	-0.06 (-0.15)		
Governance					-0.62* (-1.90)	-0.59 (-1.44)
BoardSize		-6.85*** (-3.08)		-6.65 (-3.01)		-6.59*** (-2.99)
FSize		-0.01 (-0.90)		-0.01 (-0.75)		-0.01 (-0.41)
ROA		-3.90*** (-6.03)		-3.83*** (-5.95)		-3.82* (-5.98)
N	635	635	635	635	635	635
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-Square	-0.01	0.015	-0.011	0.011	-0.015	-0.00

Each cell shows the coefficient estimate of the explanatory variable, followed (in parentheses) by its *t*-statistic. ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 6 provides the results of the clean estimates. Briefly, this study present only the clean estimates for the total ESG impact on the cost of debt. The results in Table 6 show that, parallel to the base case, the estimates based on an exogenous ESG shock have the same sign and are statistically significant at the 1% level.

Table 6 Clean Estimates

	Coefficient Estimate	Result from base case	"Clean" Estimate
Table 4: Model 2 (ESG Score)		-0.49** -1.07	-0.57* -0.77
Table 5: Model 2 (Environmental)		0.194 0.71	1.360 2.19
Table 5: Model 4 (Social)		-0.506 -1.51	-0.375 -0.62
Table 5: Model 6 (Governance)		-0.59 -1.44	-2.049** -2.57

Discussion

Impact of ESG Score on Cost of Debt

The negative relationship between ESG scores and the cost of debt, with higher ESG scores correlating with lower borrowing costs, is supported by various studies. Research indicates that ESG scores offer valuable insights into a firm's risk profile, with high scores associated with reduced downside risk, particularly in firms with high information asymmetry (Jang et al., 2020). Further evidence from the energy sector reinforces the notion that strong ESG performance is associated with lower capital costs. Studies suggest that when companies adopt a comprehensive, integrated ESG approach, they often benefit from lower financing costs (Yilmaz, 2022). The pattern is also evident in European markets, where firms with high ESG ratings tend to enjoy more favorable debt terms. These findings collectively support the growing integration of ESG factors into credit risk assessments, underscoring the financial value of sustainable and responsible corporate practices (Eliwa et al., 2019).

Impact of Environmental, Social, and Governance Scores on Cost of Debt

The regression results in Table 5 indicate that environmental and social dimensions of ESG performance do not significantly influence firms' cost of debt, as their coefficients remain statistically insignificant across all model specifications (Bauer & Hann, 2010; Weber, Fenchel, & Scholz, 2008; Oikonomou, Brooks, & Pavelin, 2014). In contrast, governance shows a negative and statistically significant coefficient at the 10% level, suggesting that stronger governance practices are associated with a modest reduction in borrowing costs. This finding aligns with prior research that emphasizes governance as a mechanism for mitigating agency risks and information asymmetry, thereby reassuring creditors and reducing the perceived risk of default (Ashbaugh-Skaife, Collins, & LaFond, 2006; Bhojraj & Sengupta, 2003). Overall, the analysis highlights governance as the only ESG component with a meaningful influence on financial risk assessment. At the same time, environmental and social factors appear less relevant in determining debt pricing within this sample.

Among the three ESG pillars, governance appears to play a particularly influential role—improvements in corporate governance are shown to significantly enhance creditworthiness, thereby lowering borrowing costs and boosting lender confidence (Ramirez et al., 2022).

The findings suggest that, in this context, environmental and social factors do not exert a statistically significant influence on the cost of debt. It may indicate that lenders place greater emphasis on governance when evaluating credit risk, likely due to its more immediate connection to corporate accountability, financial oversight, and managerial integrity (Bhojraj & Sengupta, 2003). Governance mechanisms—such as board structure, transparency, and control systems—are often seen as key indicators of a firm's ability to manage financial obligations responsibly. As such, this result highlights the pivotal role of governance in mitigating risk in debt financing decisions.

Endogeneity Issue

Table 6 presents clean estimates of all independent variables, controlling for variables from Tables 4 and 5, individual dummies, and the interactions between Post-FSA and Noncompliant. Following Coles (2010), joint tests for $\beta_1 + \beta_3 + \beta_4 = 0$ are reported. All regressions include year fixed effects. Robust t-statistics are in parentheses, with * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

Table 6 shows the consistent effects of ESG and governance scores in the regression. It shows a significant effect only when control variables are excluded, yet it becomes significant when tested in the treatment group.

Theoretical Implications

This study contributes to the growing literature on ESG and corporate financing by refining the understanding of how ESG components differentially influence firms' cost of debt. While prior studies often treat ESG as a composite construct, this study's findings underscore the importance of disaggregating ESG into its environmental, social, and governance dimensions when examining debt pricing. The empirical evidence confirms that, although aggregate ESG scores are negatively associated with borrowing costs, governance emerges as the dominant theoretical channel through which ESG affects lenders' risk assessments. From a theoretical perspective, the results reinforce agency theory and information asymmetry frameworks. Governance mechanisms—such as board oversight, transparency, and internal controls—directly mitigate agency conflicts between managers and creditors, thereby lowering perceived default risk. This aligns with classical arguments by Bhojraj and Sengupta (2003) and Ashbaugh-Skaife et al. (2006), who emphasize governance quality as a key determinant of debt contracting efficiency.

In contrast, environmental and social dimensions appear to have weaker explanatory power for debt pricing, suggesting that their impact may be more indirect, long-term, or context-dependent. Furthermore, the study extends ESG-credit risk literature by highlighting that the relevance of ESG dimensions is contingent on institutional and regulatory contexts. The endogeneity-adjusted results, particularly those observed in the Post-FSA and treatment-group analyses, suggest that ESG information becomes more value-relevant to creditors when the regulatory framework enhances disclosure credibility and comparability. It supports signaling theory, which holds that ESG disclosures serve as credible signals of firm quality only when backed by regulatory enforcement (Eliwa et al., 2019).

Overall, the findings challenge the assumption of symmetric importance across ESG pillars and contribute to theory by positioning governance as the primary ESG-based risk mitigation mechanism in debt markets. At the same time, environmental and social factors may play a secondary or complementary role.

Practical Implications

From a practical standpoint, the findings offer several important insights for corporate managers, lenders, regulators, and investors. For corporate managers, the results suggest that ESG investments should be strategically prioritized. While environmental and social initiatives remain important for legitimacy, sustainability, and long-term value creation, improvements in corporate governance are more likely to yield immediate financial benefits, such as lower borrowing costs. Strengthening board independence, enhancing financial transparency, and improving internal control systems can directly improve firms' creditworthiness and reduce financing expenses. For lenders and financial institutions, the study provides empirical evidence to support placing greater weight on governance indicators when incorporating ESG into credit risk assessments. Governance-related information appears to be more closely aligned with default risk, managerial discipline, and repayment capacity. It implies that ESG-integrated lending models should adopt pillar-specific weighting schemes, rather than relying solely on aggregate ESG scores. For regulators and policymakers, particularly in emerging markets, the findings highlight the importance of regulatory frameworks—such as FSA regulations—in enhancing the usefulness of ESG information. More vigorous enforcement and standardized ESG disclosure requirements can enhance the credibility of ESG signals, enabling creditors to distinguish more effectively between compliant and non-compliant firms. It supports the role of regulation in reducing information asymmetry and improving capital allocation efficiency. For investors and credit analysts, the results suggest caution in interpreting high ESG scores as uniformly indicative of lower financial risk. While ESG performance is relevant, governance quality should be treated as a critical screening variable in fixed-income investment decisions. Environmental and social factors may still matter, but their influence on debt pricing may materialize indirectly through long-term risk exposure rather than immediate borrowing costs. The endogeneity analysis implies that ESG effects are context-sensitive. ESG and governance scores become more meaningful when firms are subject to regulatory scrutiny or policy interventions. Practically, this suggests that ESG-driven financing benefits are not automatic but depend on institutional credibility and enforcement mechanisms.

Conclusion

This study examines the effect of ESG practices on firms' cost of debt, assessing whether stronger ESG performance is associated with lower borrowing costs. This research provides compelling evidence that ESG practices, particularly robust governance mechanisms, are significantly associated with lower debt costs. The detailed analysis revealed that, while overall ESG scores have a positive impact on financial metrics, the individual effects of Environmental and Social scores are less pronounced than those of Governance scores. It indicates that Governance practices play a pivotal role in influencing creditor perceptions and decisions, thereby affecting the cost of debt more substantially than environmental and social practices. The implications of these findings are substantial for corporate managers and policymakers. For corporations, prioritizing governance improvements can be a strategic approach to securing favorable financing terms.

Policymakers might consider regulations that encourage or mandate comprehensive governance practices, potentially yielding broader economic benefits by improving corporate financial health.

This research makes a significant theoretical contribution to the growing body of literature on ESG practices by addressing an important gap: the impact of ESG scores on the cost of debt in an emerging market context, specifically Indonesia. While previous studies have predominantly focused on developed economies with mature financial markets, this study explores the implications of ESG in an emerging market characterized by unique environmental, social, and governance challenges.

By examining the Indonesian market, this study contributes to the limited understanding of ESG practices in emerging economies. This research enriches the theoretical discourse by exploring whether ESG practices in such contexts deliver financial benefits comparable to those observed in developed countries, particularly by lowering debt costs. By extending existing frameworks on the relationship between ESG scores and the cost of debt, the study contributes to the literature on ESG practices in developing countries. It explores the interplay between ESG performance and credit risk assessment, particularly in markets with different stakeholder expectations and varying levels of corporate governance maturity. By doing so, it challenges and refines existing theories that primarily emerge from studies conducted in Western economies, offering a more nuanced understanding applicable to diverse economic settings.

This study has several limitations that should be carefully considered when interpreting the findings. First, the analysis relies primarily on correlational methods, which help identify associations but do not allow for causal inference. Consequently, the direction of influence between ESG performance and the cost of debt cannot be conclusively established. Second, although the dataset is relatively comprehensive, it may not fully capture industry-specific heterogeneity, potentially obscuring variations in how ESG practices affect borrowing costs across different sectors. Third, the model does not explicitly incorporate broader macroeconomic and regulatory factors—such as market volatility, monetary policy changes, or shifts in sustainability regulations—which may independently influence firms' financing costs.

Building on these limitations, future research could adopt a longitudinal or panel-based design to more effectively examine the causal relationships and dynamics between ESG practices and debt costs over time. Expanding the set of explanatory variables to include macroeconomic conditions and regulatory environments would also enhance the robustness and contextual relevance of the findings. Furthermore, qualitative approaches—such as interviews with lenders or credit analysts—could provide deeper insights into how creditors perceive different ESG components and how these perceptions shape financing decisions. Such complementary methods would not only address the limitations of correlational analysis but also enrich the understanding of the mechanisms through which ESG performance influences the cost of debt.

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Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.



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