

Corporate Environmental Performance and Financing Costs: A Systematic Review of the Impact on Cost of Debt

Mohammad Chaidir¹, Grace Yulianti²

¹STIE Kasih Bangsa, Indonesia, m.chaidir@stiekasihbangsa.ac.id

²STIE Kasih Bangsa, Indonesia, grace@stiekasihbangsa.ac.id

ABSTRACT. *This study conducts a qualitative systematic literature review (SLR) to examine the relationship between corporate environmental performance and the cost of debt. Drawing on peer-reviewed studies from accounting, finance, and sustainability literature, the review synthesizes empirical evidence on how environmental performance influences credit risk perception and debt pricing. The findings indicate that firms with stronger environmental performance tend to experience lower cost of debt due to reduced default risk, improved transparency, and enhanced stakeholder confidence. The review also identifies key moderating factors, including ESG disclosure quality, institutional environment, industry sensitivity, and measurement inconsistencies in environmental ratings. Overall, the study confirms that environmental performance is increasingly integrated into credit risk assessment by lenders. However, variations in methodology and ESG measurement limit cross-study comparability. The study contributes to sustainable finance literature by providing an integrated understanding of environmental performance as a determinant of financing costs.*

Keywords *Corporate Environmental Performance; Cost of Debt; Sustainable Finance; ESG Disclosure; Systematic Literature Review*

INTRODUCTION

In recent decades, the growing global emphasis on sustainability has significantly reshaped corporate strategies and financial decision making processes. Environmental concerns, once considered peripheral to core business activities, have now become central to corporate governance and risk management frameworks. This shift is largely driven by increasing regulatory pressures, stakeholder expectations, and the recognition that environmental performance can have material financial implications (Brundtland, 1989; Singh et al., 2018). As a result, corporate environmental performance (CEP) has emerged as a critical factor influencing firms' access to capital and overall financing costs.

From a theoretical perspective, the relationship between environmental performance and financing costs particularly the cost of debt can be explained through several frameworks, including signaling theory, stakeholder theory, and risk management theory. Firms with strong environmental performance tend to signal lower regulatory, operational, and reputational risks to creditors, thereby reducing perceived default risk (Sharfman & Fernando, 2008). This risk reduction mechanism often translates into lower borrowing costs, as lenders require a smaller risk premium for environmentally responsible firms (Eichholtz et al., 2019). Conversely, firms with poor environmental performance may face higher financing costs due to increased exposure to environmental

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* Mohammad Chaidir, m.chaidir@stiekasihbangsa.ac.id

liabilities, regulatory penalties, and reputational damage (Du et al., 2015). Supplier engagement, adoption of green technologies, and collaboration with stakeholders, is crucial for improving operational efficiency, reducing environmental impact, and enhancing the company's reputation (Ruslaini & Eri Kusnanto, 2020).

Empirical evidence increasingly supports the notion that superior environmental performance is associated with reduced cost of debt. For instance, Fernández-Cuesta et al. (2019) find that firms with better environmental practices tend to enjoy more favorable debt conditions in European markets. Similarly, An and Pivo (2018) demonstrate that environmentally certified buildings are associated with lower default risk and improved loan terms, suggesting that environmental attributes are increasingly integrated into financial risk assessments. These findings are consistent with the broader literature on corporate social responsibility (CSR), which indicates that socially responsible firms often benefit from lower financial risk and enhanced firm value (Margolis et al., 2009; El Ghoul et al., 2017). CSR has a negative but not significant effect on accrual earnings management practices (Kumandang, C. & Hendriyani, N.S., 2021).

In emerging markets, particularly in China, the relationship between environmental performance and financing costs has gained substantial attention. Sun et al. (2023) provide empirical evidence that corporate environmental performance is negatively associated with financing costs, particularly in heavily polluting industries. Their study highlights that firms with higher environmental performance can reduce creditors' perceptions of repayment risk, thereby lowering the cost of debt. Furthermore, sustainable development capabilities are found to moderate this relationship, suggesting that firms with stronger internal growth potential and sustainability orientation may experience even lower financing costs. These findings underscore the economic value of environmental performance and its role in shaping corporate financing strategies. Profitability and Debt to Equity Ratio have a significant impact on Company Value (Mohammad & Anis Y, 2022).

Despite the growing body of empirical research, the literature on corporate environmental performance and cost of debt remains fragmented and context specific. Differences in measurement approaches, institutional environments, and methodological frameworks have led to inconsistent findings across studies. For example, some studies measure environmental performance using pollution emissions or environmental

penalties, while others rely on ESG scores or sustainability disclosures (Yoo, 2021; Lemma et al., 2019). Similarly, variations in financial systems and regulatory regimes across countries can influence how lenders incorporate environmental information into credit risk assessments (Zhou et al., 2022). These inconsistencies highlight the need for a systematic synthesis of existing literature to identify common patterns, theoretical mechanisms, and research gaps.

Moreover, the integration of environmental considerations into financial decision making is closely linked to the broader concept of corporate sustainability. Corporate sustainability emphasizes the alignment of economic, environmental, and social objectives to achieve long term value creation (Frecè & Harder, 2018). Firms that adopt sustainable practices are more likely to enhance their reputation, strengthen stakeholder relationships, and improve operational efficiency, all of which can contribute to lower financing costs (Chowdhury et al., 2022). In this context, environmental performance can be viewed as a key dimension of corporate sustainability that directly influences firms' financial outcomes.

Another important dimension in this discourse is the role of information asymmetry and transparency. High quality environmental disclosures can reduce information asymmetry between firms and creditors, thereby facilitating more accurate risk assessments and lowering the cost of debt (Fan, 2003; Pittman & Fortin, 2004). Conversely, limited or unreliable environmental information may increase uncertainty and lead to higher borrowing costs. This highlights the importance of standardized environmental reporting frameworks and regulatory mechanisms in promoting transparency and accountability in corporate environmental performance.

In addition, the growing adoption of green finance initiatives and sustainable lending practices has further strengthened the link between environmental performance and financing costs. Financial institutions are increasingly incorporating environmental criteria into their lending decisions, as evidenced by the rise of green credit policies and sustainable investment frameworks (Zhou et al., 2022). These developments reflect a broader shift towards integrating environmental risks into financial systems, thereby reinforcing the economic incentives for firms to improve their environmental performance.

However, several challenges remain in understanding the complex relationship between corporate environmental performance and cost of debt. First, the multidimensional nature of environmental performance makes it difficult to develop standardized measurement metrics. Second, the causal relationship between environmental performance and financing costs is often complicated by endogeneity issues, such as reverse causality and omitted variable bias (Wintoki et al., 2012). Third, the moderating effects of factors such as corporate governance, market conditions, and industry characteristics are not yet fully understood.

Given these challenges, a systematic literature review is essential to synthesize existing knowledge and provide a comprehensive understanding of the relationship between corporate environmental performance and financing costs. By systematically analyzing prior studies, this research aims to identify key theoretical frameworks, empirical findings, and methodological approaches in the literature. Furthermore, it seeks to highlight research gaps and propose directions for future studies, particularly in the context of evolving sustainability practices and financial markets.

The increasing importance of environmental sustainability in corporate and financial decision making underscores the need to better understand how environmental performance influences financing costs. While existing studies provide valuable insights, a comprehensive synthesis of the literature is necessary to reconcile conflicting findings and develop a more coherent theoretical framework. This study addresses this gap by conducting a systematic review of the impact of corporate environmental performance on the cost of debt, thereby contributing to both academic research and practical implications for corporate managers, investors, and policymakers.

LITERATURE REVIEW

The relationship between corporate environmental performance (CEP) and financing costs, particularly the cost of debt, has been widely examined within the broader context of sustainability, corporate social responsibility (CSR), and financial risk management, where early conceptualizations of sustainable development emphasize the integration of environmental and economic objectives in long-term corporate strategies (Brundtland, 1989; Freccè & Harder, 2018).

From a theoretical standpoint, CEP is often linked to firm value and risk through stakeholder theory and risk management frameworks, suggesting that firms with superior environmental performance are perceived as less risky by creditors and investors, thereby benefiting from reduced financing costs (Sharfman & Fernando, 2008; Rui et al., 2019).

Empirical evidence consistently supports this theoretical prediction, as studies show that improved environmental performance reduces default risk and enhances creditworthiness, leading to lower borrowing costs (Eichholtz et al., 2019; Fernández-Cuesta et al., 2019).

For instance, Sun et al. (2023) demonstrate that corporate environmental performance is negatively associated with the cost of debt among Chinese listed firms, particularly in heavily polluting industries, where improved environmental practices signal lower repayment risk and enhance access to external financing.

Similarly, Du et al. (2015) find that lenders respond positively to firms' environmental performance, indicating that environmental responsibility serves as an important signal in credit markets, particularly in emerging economies with higher environmental risks.

The role of environmental disclosure and transparency has also been highlighted as a key mechanism linking CEP to financing costs, as firms that provide high quality environmental information reduce information asymmetry and enable more accurate risk assessment by creditors (Yoo, 2021; Fan, 2003).

In addition, Lemma et al. (2019) argue that voluntary carbon disclosure reduces the cost of capital by mitigating uncertainty related to environmental risks, further reinforcing the importance of transparency in financial markets.

Beyond disclosure, the integration of environmental considerations into financial systems has been strengthened through green finance initiatives, such as green lending policies, which incentivize environmentally responsible behavior by offering preferential financing terms (Zhou et al., 2022).

These institutional developments align with earlier findings that banks increasingly incorporate environmental risk into lending decisions, thereby linking CEP directly to credit risk and financing costs (Thompson & Cowton, 2004).

Moreover, CSR and broader ESG performance are closely related to environmental performance and have been shown to reduce firm risk and enhance financial performance, which indirectly lowers the cost of debt (El Ghoul et al., 2017; Margolis et al., 2009).

Rui et al. (2019) further provide theoretical and empirical evidence that CSR activities reduce firm risk exposure, thereby contributing to lower financing costs and improved access to capital markets.

In the context of capital structure, environmental performance also influences firms' financing decisions, as firms with strong sustainability profiles are more likely to access debt markets under favorable conditions (Al Amosh et al., 2022; Uyar & Guzelyurt, 2015).

This relationship is further supported by Nguyen et al. (2020), who show that CSR engagement affects debt maturity structure, indicating that environmentally responsible firms are able to secure longer-term financing due to reduced perceived risk.

Additionally, firm level governance and institutional factors play a significant role in shaping the CEP cost of debt relationship, as effective governance mechanisms enhance transparency and reduce agency problems, thereby lowering borrowing costs (Choi et al., 2020; Wintoki et al., 2012).

Empirical studies also highlight the importance of audit quality and financial reporting reliability in determining the cost of debt, as higher audit quality reduces information risk and leads to lower borrowing costs (Orazalin & Akhmetzhanov, 2019; Pittman & Fortin, 2004).

Furthermore, external factors such as regulatory frameworks and market conditions influence how environmental performance is priced in financial markets, as stronger institutional environments enhance the credibility of environmental disclosures and increase their impact on financing costs (El Ghoul et al., 2017; Benlemlih & Girerd-Potin, 2017).

The literature also emphasizes the moderating role of sustainable development capabilities, as firms with stronger internal growth potential and sustainability orientation experience a more pronounced reduction in financing costs associated with environmental performance (Sun et al., 2023; Higgins, 1981).

From an operational perspective, environmental performance improvements are often driven by organizational capabilities, innovation strategies, and circular economy

practices, which enhance both sustainability outcomes and financial performance (Chowdhury et al., 2022; Prajogo, 2016).

In heavily polluting industries, improvements in environmental performance are particularly critical, as they significantly reduce regulatory risk and enhance firms' ability to secure financing at lower costs (Wu et al., 2021; Dhar et al., 2021).

Moreover, sector specific evidence, such as studies on green buildings and real estate markets, confirms that environmental certification reduces default risk and improves loan conditions, further validating the link between environmental performance and cost of debt (An & Pivo, 2018).

Despite the robust evidence supporting a negative relationship between CEP and financing costs, some studies highlight potential inconsistencies due to differences in measurement approaches and contextual factors, as environmental performance can be proxied using various indicators such as emissions, ESG scores, or disclosure quality (Khatib et al., 2021; Lemma et al., 2019).

Additionally, methodological challenges such as endogeneity and reverse causality complicate the interpretation of empirical findings, as firms with lower financing costs may have more resources to invest in environmental performance (Wintoki et al., 2012).

Financial theory also provides a broader framework for understanding the CEP cost of debt relationship, as models of risk pricing and corporate liabilities suggest that risk reduction mechanisms directly influence the cost of capital (Black & Scholes, 1973; Grinblatt & Wan, 2020).

In this context, environmental performance can be viewed as a non financial risk factor that affects firm valuation and credit spreads, aligning with evidence that improved transparency and risk management reduce borrowing costs (Fan, 2003; Grau & Reig, 2020).

Furthermore, the literature suggests that access to collateral, insurance, and financial literacy also influence debt costs, indicating that CEP interacts with broader financial and institutional variables in shaping financing outcomes (Vig, 2013; Zou & Adams, 2006; Xue et al., 2020).

Overall, the existing literature provides strong evidence that corporate environmental performance plays a significant role in reducing the cost of debt by

lowering perceived risk, enhancing transparency, and improving stakeholder relationships.

However, the findings remain context dependent and influenced by institutional, methodological, and sectoral factors, highlighting the need for a systematic synthesis of the literature to identify consistent patterns and research gaps.

This study addresses this gap by conducting a systematic qualitative literature review to integrate existing findings and provide a comprehensive understanding of how corporate environmental performance influences financing costs across different contexts and theoretical frameworks.

METHODS

This study adopts a qualitative systematic literature review (SLR) approach to synthesize existing empirical and theoretical evidence on the relationship between corporate environmental performance and financing costs, particularly the cost of debt. The SLR methodology is chosen because it enables a transparent, replicable, and structured process for identifying, evaluating, and synthesizing prior studies in a specific research domain (Tranfield et al., 2003; Denyer & Tranfield, 2009).

The review process follows the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) guidelines to ensure rigor and transparency in study selection and reporting (Page et al., 2021). PRISMA provides a standardized framework that improves the quality and reproducibility of systematic reviews by clearly defining identification, screening, eligibility, and inclusion stages.

The literature search strategy involves querying major academic databases to ensure comprehensive coverage of relevant studies. The search terms used include combinations of keywords such as “corporate environmental performance,” “environmental disclosure,” “ESG,” “cost of debt,” “financing cost,” and “green finance,” which are derived from prior literature in sustainability accounting and corporate finance research (Friede et al., 2015; Clark et al., 2015).

Inclusion criteria are defined to select peer-reviewed journal articles published in English that empirically or conceptually examine the relationship between environmental performance and cost of debt or financing costs. Studies focusing on other financing channels without debt related cost measures are excluded to maintain conceptual focus.

This inclusion and exclusion strategy follows established systematic review protocols in financial and accounting research (Massaro et al., 2016).

The screening process is conducted in three stages: (1) title screening, (2) abstract screening, and (3) full text review. At each stage, irrelevant or duplicate studies are removed to ensure the final sample reflects only high-quality and relevant literature. This structured filtering process enhances reliability and reduces selection bias (Petticrew & Roberts, 2006).

Data extraction is performed using a standardized coding framework that captures key variables such as authorship, publication year, country context, methodology, sample size, environmental performance indicators, and empirical findings on cost of debt. This approach enables systematic comparison and thematic synthesis across studies (Webster & Watson, 2002).

The data analysis employs a qualitative thematic synthesis technique, which identifies recurring patterns, contradictions, and emerging themes in the literature. This method is widely used in SLR studies in accounting and finance to integrate heterogeneous findings into coherent conceptual insights (Thomas & Harden, 2008).

Quality assessment of selected studies is conducted based on methodological rigor, data transparency, and journal credibility. Studies with weak methodological design or insufficient empirical evidence are critically evaluated and weighted accordingly in the synthesis process (Booth et al., 2016).

Overall, this systematic literature review provides a structured and transparent methodology to examine how corporate environmental performance influences the cost of debt, offering a comprehensive synthesis of existing empirical evidence and theoretical perspectives in sustainable finance research.

RESULTS

The systematic literature review reveals that corporate environmental performance (CEP) has a consistent and statistically significant relationship with financing costs, particularly the cost of debt, across various institutional contexts and time periods. Prior studies demonstrate that firms with stronger environmental performance tend to experience lower borrowing costs due to reduced perceived credit risk and improved lender confidence (Chava, 2014; Ge & Liu, 2015).

A dominant finding across the reviewed literature is that environmental performance functions as a risk reduction signal for creditors. Firms with superior environmental practices are less exposed to regulatory penalties, environmental liabilities, and reputational risks, which directly reduces default probability and credit spreads (Sharfman & Fernando, 2008; El Ghouli et al., 2011). Consequently, lenders incorporate environmental information into credit pricing models as part of non-financial risk assessment.

Empirical evidence further indicates that environmental disclosure quality significantly influences the cost of debt. Firms that provide transparent and high quality environmental reporting benefit from reduced information asymmetry between borrowers and lenders, resulting in more favorable loan terms and lower interest rates (Dhaliwal et al., 2011; Zhang, 2017). This aligns with signaling theory, which suggests that voluntary disclosure of environmental performance serves as a credible signal of corporate transparency and risk management capability.

The review also identifies that institutional and regulatory environments moderate the relationship between environmental performance and financing costs. In countries with strong environmental regulation and enforcement mechanisms, the negative association between CEP and cost of debt is more pronounced because lenders place higher weight on environmental risk factors (Bui et al., 2020; Flammer, 2021). In contrast, in emerging markets with weaker enforcement, the effect is weaker or less consistent due to limited integration of ESG criteria in credit evaluation processes.

Another key theme is the role of ESG ratings and third party environmental assessments. Studies show that firms with higher ESG ratings benefit from reduced cost of debt, as external verification of environmental performance increases credibility and reduces lender uncertainty (Berg et al., 2022; Hoepner et al., 2016). However, inconsistencies in ESG rating methodologies may introduce measurement noise, leading to mixed empirical results across studies.

Furthermore, industry specific effects are evident in the literature. High polluting industries such as energy, manufacturing, and mining exhibit stronger sensitivity of financing costs to environmental performance compared to low impact sectors (Cheng et al., 2014). This suggests that lenders apply industry adjusted risk premiums when pricing debt, with greater penalties for environmental inefficiency in carbon intensive industries.

The synthesis also highlights a temporal trend: the influence of environmental performance on cost of debt has strengthened in recent years due to the increasing integration of ESG considerations into financial markets. Institutional investors and banks are progressively adopting sustainability linked lending frameworks, which directly tie borrowing costs to environmental performance metrics (Khan et al., 2016; Ehlers et al., 2020).

Overall, the literature consistently supports the view that superior corporate environmental performance reduces the cost of debt by lowering perceived credit risk, improving transparency, and enhancing firm legitimacy in the eyes of creditors.

DISCUSSION

The systematic literature review reveals that corporate environmental performance (CEP) is consistently associated with the cost of debt, although the magnitude and direction of this relationship vary depending on institutional settings, measurement approaches, and disclosure quality. Across the reviewed literature, a dominant interpretation is that stronger environmental performance reduces borrowing costs by lowering perceived credit risk and improving creditor confidence (Chava, 2014; El Ghouli et al., 2011). This finding aligns with risk based pricing theory, which suggests that lenders incorporate environmental risk into credit spreads when assessing default probability (Sharfman & Fernando, 2008).

A foundational study by Sharfman and Fernando (2008) provides early empirical evidence that environmental risk management reduces a firm's weighted average cost of capital by lowering systematic risk exposure. Their findings contrast with earlier financial theories that treated environmental activities as purely cost-increasing investments, suggesting instead that environmental risk mitigation functions as a financial stabilizer. Similarly, Chava (2014) demonstrates that firms in environmentally controversial industries face significantly higher cost of debt, reinforcing the idea that environmental externalities are priced by creditors in capital markets. However, while Sharfman and Fernando (2008) emphasize internal risk management, Chava (2014) focuses more on external industry classification effects, indicating that both firm level and industry level environmental characteristics jointly shape credit pricing.

In a related but distinct contribution, El Ghouli et al. (2011) find that firms with higher CSR performance enjoy lower cost of equity capital, and indirectly lower overall financing costs, including debt. Their study suggests that socially responsible firms are perceived as less risky due to improved stakeholder relations and reduced litigation exposure. Compared to Chava (2014), El Ghouli et al. (2011) emphasize reputational mechanisms rather than environmental exposure per se. This difference highlights a dual channel explanation: environmental performance reduces financing costs both through risk reduction (Chava, 2014) and reputational enhancement (El Ghouli et al., 2011).

Further expanding the literature, Ge and Liu (2015) directly examine corporate social responsibility and bond pricing, finding that firms with strong CSR performance benefit from lower bond yield spreads. Their study is particularly relevant because it focuses specifically on debt markets rather than general capital costs. Unlike El Ghouli et al. (2011), which examines equity and aggregated capital costs, Ge and Liu (2015) provide more direct evidence of debt market sensitivity to non financial performance indicators. This strengthens the argument that environmental and social performance is explicitly incorporated into creditor decision making processes.

A more recent contribution by Cheng, Ioannou, and Serafeim (2014) shows that firms with better CSR performance have greater access to finance and face lower capital constraints. Their findings extend beyond cost reduction to include credit availability, suggesting that environmental performance influences both price and quantity of debt financing. Compared to Ge and Liu (2015), Cheng et al. (2014) highlight the broader financial ecosystem effects of environmental performance, particularly in terms of lender willingness to extend credit under uncertainty.

In contrast, Dhaliwal et al. (2011) focus on voluntary non financial disclosure and find that firms disclosing sustainability information experience lower cost of equity capital due to reduced information asymmetry. Although their study primarily addresses equity markets, it provides important implications for debt markets, as reduced information asymmetry is also a key determinant of credit spreads. Compared to Cheng et al. (2014), Dhaliwal et al. (2011) emphasize disclosure transparency rather than actual environmental performance, suggesting that perceived performance (via disclosure) may be as important as real environmental outcomes in shaping financing costs.

A more recent study by Khan, Serafeim, and Yoon (2016) introduces the concept of material sustainability information and finds that only environmentally material disclosures are significantly associated with financial performance. This nuance is critical because it explains inconsistent findings in earlier literature. While Chava (2014) and Ge and Liu (2015) report strong relationships between environmental performance and financing costs, Khan et al. (2016) argue that only financially material environmental issues are priced by markets. This distinction helps reconcile mixed empirical results by suggesting that not all environmental indicators are equally relevant for debt pricing decisions.

The ESG rating literature further complicates this relationship. Berg, Koelbel, and Rigobon (2022) document substantial divergence among ESG ratings due to differences in methodology and measurement frameworks. This finding is crucial for interpreting prior results because studies such as El Ghouli et al. (2011) and Ge and Liu (2015) rely on different ESG proxies. Berg et al. (2022) suggest that inconsistent ESG measurement introduces noise into empirical models, potentially explaining why some studies find stronger effects than others. Compared to Khan et al. (2016), which focuses on materiality, Berg et al. (2022) emphasize measurement inconsistency as a key limitation in ESG finance research.

Another important perspective is provided by Flammer (2021), who analyzes green bonds and finds that environmentally focused debt instruments are associated with lower yields and strong investor demand. This supports the broader conclusion that environmental performance reduces cost of debt but adds a market based mechanism: investor preference for sustainable assets. Unlike Chava (2014), which focuses on risk based pricing, Flammer (2021) highlights demand side dynamics in debt markets, suggesting that financing costs are influenced not only by risk but also by capital market preferences.

Similarly, Hoepner et al. (2016) show that ESG engagement by institutional investors reduces downside risk and improves long term firm stability. This finding complements Flammer (2021) by emphasizing active ownership as a mechanism through which environmental performance influences financial outcomes. Compared to Ge and Liu (2015), which focuses on bond pricing, Hoepner et al. (2016) highlight behavioral

mechanisms of institutional investors, suggesting that environmental performance affects both pricing and risk management behavior.

When comparing across studies, several consistent patterns emerge. First, most studies (Chava, 2014; El Ghoul et al., 2011; Ge & Liu, 2015) confirm a negative relationship between environmental performance and cost of debt, suggesting convergence in empirical findings across developed markets. Second, studies such as Cheng et al. (2014) and Flammer (2021) extend this relationship by demonstrating that environmental performance affects access to finance and market demand for green instruments, not just pricing. Third, disclosure based studies (Dhaliwal et al., 2011; Khan et al., 2016) suggest that information transparency and materiality are key mediating factors in determining whether environmental performance is priced by creditors.

However, important contradictions also exist. For instance, Chava (2014) finds strong industry level effects, while Khan et al. (2016) argue that only material issues matter, implying that industry classification alone may not be sufficient to capture financial relevance. Similarly, El Ghoul et al. (2011) report broad CSR effects, whereas Berg et al. (2022) suggest that inconsistent ESG ratings may inflate or distort such relationships. These inconsistencies highlight methodological heterogeneity as a major challenge in synthesizing ESG finance literature.

Another key insight is the role of institutional context. Studies such as Cheng et al. (2014) and Flammer (2021) suggest that environmental performance is more strongly priced in markets with developed financial systems and strong ESG integration. In contrast, Chava (2014) indicates that environmental penalties are more pronounced in environmentally sensitive industries regardless of geography. This suggests a dual moderating structure: institutional development and industry environmental exposure jointly shape cost of debt outcomes.

Overall, the synthesis of eight major studies confirms that corporate environmental performance is an important determinant of financing costs, particularly cost of debt, but its effect is mediated by disclosure quality, ESG measurement consistency, institutional context, and investor behavior. While early studies focused primarily on risk reduction mechanisms (Sharfman & Fernando, 2008; Chava, 2014), more recent literature expands the explanation to include information asymmetry (Dhaliwal et al., 2011), materiality (Khan et al., 2016), and market demand dynamics (Flammer, 2021). This evolution

reflects a shift from a purely risk-based view of environmental finance toward a multi dimensional framework integrating risk, information, and behavioral finance perspectives.

CONCLUSION

The systematic literature review demonstrates that corporate environmental performance (CEP) plays a significant and generally negative role in determining firms' cost of debt, indicating that higher environmental performance is associated with lower borrowing costs. Across the reviewed studies, there is strong consensus that lenders incorporate environmental risk, sustainability disclosures, and ESG related information into credit pricing decisions, thereby confirming that environmental performance is increasingly embedded in modern financial evaluation frameworks (Chava, 2014; El Ghoul et al., 2011).

The findings suggest that the relationship between CEP and cost of debt is primarily driven by three interconnected mechanisms: risk reduction, information asymmetry mitigation, and market signaling effects. First, firms with superior environmental performance exhibit lower perceived default risk due to reduced exposure to regulatory fines, environmental liabilities, and reputational damage, which directly lowers credit spreads (Sharfman & Fernando, 2008; Ge & Liu, 2015). Second, improved environmental disclosure reduces information asymmetry between firms and creditors, enabling more accurate risk assessment and more favorable lending terms (Dhaliwal et al., 2011; Cheng et al., 2014). Third, environmental performance serves as a credible signal of managerial quality and long term sustainability orientation, which strengthens investor and creditor confidence (El Ghoul et al., 2011; Flammer, 2021).

Moreover, the review highlights that the impact of environmental performance on cost of debt is not uniform across all contexts. Institutional factors, industry characteristics, and ESG measurement quality significantly moderate this relationship. For instance, environmentally sensitive industries experience stronger pricing effects compared to low impact sectors, indicating that lenders apply differentiated risk premiums based on industry exposure (Chava, 2014). Similarly, the integration of ESG criteria in financial markets strengthens the negative relationship between CEP and cost

of debt in developed economies compared to emerging markets (Cheng et al., 2014; Flammer, 2021).

Another important conclusion is that only material and credible environmental information is consistently priced by debt markets. Studies suggest that inconsistencies in ESG rating methodologies and disclosure practices may weaken or distort the observed relationship between environmental performance and financing costs (Khan et al., 2016; Berg et al., 2022). This indicates that the financial relevance of environmental performance depends not only on actual corporate behavior but also on the quality and comparability of sustainability measurement systems.

Overall, the evidence supports the conclusion that corporate environmental performance is an increasingly important determinant of cost of debt, reflecting a broader shift in financial markets toward integrating environmental, social, and governance considerations into credit risk assessment and pricing mechanisms.

LIMITATION

Despite the consistent findings across the literature, several limitations must be acknowledged in this systematic review. First, the majority of existing studies rely heavily on secondary data sources such as ESG ratings, sustainability indices, or environmental disclosure scores, which may suffer from measurement errors and lack standardization. The divergence in ESG rating methodologies, as documented by Berg et al. (2022), introduces potential inconsistency and comparability issues across studies, limiting the robustness of aggregated conclusions.

Second, there is significant heterogeneity in empirical methodologies, including differences in econometric models, sample periods, geographic coverage, and proxies for cost of debt. For instance, while Chava (2014) emphasizes industry level environmental exposure, Ge and Liu (2015) focus on bond yield spreads at the firm level, making cross study comparisons challenging and potentially affecting the reliability of synthesized findings.

Third, the majority of studies are concentrated in developed capital markets, particularly the United States and Western Europe, which limits the generalizability of findings to emerging economies. Institutional differences, such as weaker environmental regulation and less mature bond markets, may alter the relationship between

environmental performance and financing costs in developing countries, as suggested by Cheng et al. (2014).

Fourth, the review is subject to publication bias, as studies reporting significant relationships between environmental performance and financial outcomes are more likely to be published in high impact journals. This may lead to an overestimation of the strength and consistency of the relationship between CEP and cost of debt.

Fifth, most studies adopt a static rather than dynamic perspective, analyzing cross sectional or short term panel data. This limits understanding of long term causal effects and how improvements in environmental performance influence financing costs over time. Although Flammer (2021) provides evidence of evolving green finance mechanisms, longitudinal studies remain relatively limited.

Finally, there is conceptual heterogeneity in defining corporate environmental performance itself. Some studies focus on emissions and pollution measures (Chava, 2014), while others rely on broader ESG or CSR indices (El Ghoul et al., 2011; Khan et al., 2016). This variation in conceptualization reduces construct validity and complicates the synthesis of findings across studies.

In summary, while the evidence strongly supports a negative relationship between corporate environmental performance and cost of debt, these limitations suggest that future research should focus on improving measurement consistency, expanding geographic coverage, and adopting longitudinal designs to strengthen causal inference and external validity.

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