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Research Article

THE PREMIUM OF TRANSPARENCY: ASSESSING THE NON-LINEAR IMPACT OF ESG RATING DISCREPANCIES ON CORPORATE COST OF DEBT DURING MACROECONOMIC UNCERTAINTY

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Abstract

Environmental, Social, and Governance (ESG) ratings have become increasingly influential in shaping corporate financing decisions and stakeholder assessments within global capital markets. Growing reliance on ESG information has enhanced the importance of transparency and sustainability disclosures; however, substantial discrepancies among ESG rating providers continue to raise concerns regarding information reliability, comparability, and credibility. Such inconsistencies may create uncertainty for creditors, particularly during periods of macroeconomic instability when risk assessment becomes more challenging. This study aims to examine the non-linear impact of ESG rating discrepancies on corporate cost of debt and to evaluate the moderating role of macroeconomic uncertainty in shaping this relationship. A quantitative research design employing panel data analysis was utilized. The study analyzed publicly listed non-financial firms observed between 2014 and 2023, using ESG ratings obtained from multiple providers alongside financial and macroeconomic indicators. Non-linear regression models and interaction analyses were applied to assess the effects of ESG rating divergence on borrowing costs. Findings indicate that ESG rating discrepancies are positively associated with corporate cost of debt and that this relationship follows a non-linear pattern. Borrowing costs increase modestly at lower levels of divergence but rise substantially once discrepancies exceed critical thresholds. Macroeconomic uncertainty significantly amplifies these effects, increasing creditor sensitivity to sustainability-related information ambiguity. The study concludes that transparency represents a valuable financial asset, as firms demonstrating greater ESG rating consistency benefit from lower financing costs and stronger creditor confidence during uncertain economic conditions.

Keywords: Corporate Cost of Debt, ESG Rating Discrepancies, Information Asymmetry, Macroeconomic Uncertainty, Sustainable Finance

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INTRODUCTION

Environmental, Social, and Governance (ESG) considerations have become increasingly influential in shaping corporate financial decisions, investment strategies, and stakeholder evaluations within global capital markets (Arianpoor & Rezaei Movahed, 2026). Growing awareness of sustainability-related risks has encouraged investors, creditors, regulators, and rating agencies to incorporate ESG performance into their assessments of corporate value and long-term resilience. Financial institutions now view ESG information as an important indicator of a firm's capacity to manage non-financial risks, maintain operational stability, and generate sustainable returns (Dai & Jiang, 2025). Expansion of sustainable finance initiatives has therefore elevated ESG ratings from supplementary disclosures to strategic signals that influence corporate access to capital and financing conditions.

Debt markets have become particularly sensitive to sustainability-related information as creditors seek to evaluate both financial and non-financial sources of risk (Erzurumlu et al., 2025). Corporate borrowing costs increasingly reflect not only traditional indicators such as profitability, leverage, and liquidity but also ESG-related factors associated with governance quality, environmental responsibility, and social performance. Firms demonstrating strong sustainability practices often benefit from lower financing costs due to reduced perceptions of long-term risk (Gargallo et al., 2026). Such developments suggest that transparency and consistency in ESG disclosures play a critical role in shaping creditor confidence and debt pricing mechanisms.

Macroeconomic uncertainty further amplifies the importance of ESG information in financial decision-making processes (Geng et al., 2025). Periods characterized by economic instability, inflationary pressures, geopolitical tensions, financial market volatility, and global crises often increase information asymmetry between corporations and external stakeholders. Under uncertain economic conditions, investors and creditors place greater emphasis on credible signals that can reduce uncertainty and facilitate risk assessment (Gidage & Bhide, 2024). ESG ratings have emerged as one such signal; however, inconsistencies among ESG rating providers raise concerns regarding the reliability, comparability, and interpretability of sustainability assessments within debt markets.

Despite the growing prominence of ESG ratings, substantial discrepancies frequently exist among evaluations issued by different rating agencies. Variations in methodologies, weighting schemes, data sources, indicator selection, and assessment criteria often result in divergent ESG scores for the same company (Hao et al., 2026). Such inconsistencies create uncertainty regarding the actual sustainability performance of firms and complicate efforts by investors and creditors to incorporate ESG information into financial decision-making. Rating divergence therefore represents a significant challenge to the credibility and effectiveness of ESG-based market assessments.

Creditors operating in debt markets may interpret ESG rating discrepancies as indicators of information opacity, disclosure quality concerns, or heightened uncertainty regarding corporate sustainability performance (Hauch, 2026). Firms receiving inconsistent evaluations from different rating providers may face greater scrutiny and higher risk perceptions among lenders. Existing evidence suggests that information ambiguity can influence financing conditions; however, the extent to which ESG rating discrepancies affect corporate cost of debt remains insufficiently understood (He & Wang, 2025). Questions concerning whether rating divergence increases borrowing costs or alters creditor behavior continue to generate significant academic and practical interest.

Complexity increases further when macroeconomic uncertainty is considere (J. Hu et al., 2025). Economic turbulence often intensifies information asymmetries and heightens sensitivity to risk-related signals. ESG rating discrepancies may therefore exert stronger effects on debt financing costs during periods of uncertainty than during stable economic conditions. Possibility of non-linear relationships further complicates analysis, as the impact of rating divergence may not increase proportionally across different levels of discrepancy (Y. Hu & Wang, 2026). Such unresolved issues highlight the need for more comprehensive investigation into the interaction among ESG transparency, rating divergence, and corporate financing outcomes.

This study aims to examine the relationship between ESG rating discrepancies and corporate cost of debt within the context of macroeconomic uncertainty. Particular attention is devoted to understanding how inconsistencies among ESG ratings influence creditor perceptions and borrowing costs (Huang et al., 2026). Examination of these relationships contributes to broader discussions concerning sustainable finance, information transparency, and risk assessment in debt markets.

Analysis of the potential non-linear effects of ESG rating discrepancies represents another important objective of the study. Investigation seeks to determine whether the influence of rating divergence on financing costs varies across different levels of discrepancy (Jiang et al., 2025). Understanding potential threshold effects, asymmetries, and non-linear dynamics may provide deeper insights into how creditors interpret ESG-related uncertainty when evaluating corporate borrowers.

Assessment of the moderating role of macroeconomic uncertainty constitutes a further objective of the research. Exploration of how economic instability influences the relationship between ESG rating discrepancies and debt financing costs may enhance understanding of investor and creditor behavior under uncertain conditions (Ju et al., 2025). Findings are expected to contribute to both theoretical development and practical decision-making in the fields of sustainable finance, corporate governance, and financial risk management.

Existing literature has extensively examined the relationship between ESG performance and corporate financing outcomes (Kacanski, 2025). Numerous studies suggest that firms with stronger ESG profiles generally experience lower capital costs, improved market valuations, and enhanced stakeholder trust. Research has also explored how sustainability disclosures influence investor behavior and financial market performance. Despite these contributions, many studies rely on aggregate ESG scores and assume relatively consistent evaluations across rating agencies.

Research concerning ESG rating divergence has expanded in recent years, highlighting significant differences among rating providers. Existing investigations frequently attribute rating discrepancies to methodological heterogeneity, measurement choices, and conceptual differences regarding sustainability performance (Kong et al., 2025). While these studies contribute valuable insights into the causes and implications of ESG rating divergence, relatively limited attention has been devoted to understanding how such discrepancies influence debt market outcomes. Much of the existing literature focuses on equity markets rather than creditor decision-making processes.

Studies examining corporate cost of debt typically emphasize financial determinants such as leverage, profitability, credit ratings, liquidity, and macroeconomic conditions. Comparatively fewer investigations integrate ESG rating discrepancies into analyses of debt financing costs (C. Li et al., 2025). Limited research also addresses the possibility of non-linear effects or examines how macroeconomic uncertainty moderates these relationships. Absence of comprehensive models connecting ESG rating divergence, information transparency, creditor perceptions, and economic uncertainty creates a significant gap in the literature and underscores the need for further investigation.

Novelty of this study lies in its integrated examination of ESG rating discrepancies, corporate cost of debt, and macroeconomic uncertainty within a unified analytical framework (R. Li et al., 2026). Existing research generally investigates these variables independently or focuses primarily on linear relationships. This study advances the literature by exploring how rating divergence functions as a signal of information transparency and by evaluating its potentially non-linear effects on borrowing costs. Such an approach offers a more nuanced understanding of how sustainability-related information influences debt market behavior.

The study introduces a distinctive perspective by conceptualizing ESG rating discrepancies not merely as measurement inconsistencies but as indicators of transparency-related risk perceived by creditors (Y. Li et al., 2026). Examination of threshold effects and non-linear dynamics provides opportunities to identify whether moderate and severe levels of rating divergence generate different market responses (L. Liu et al., 2025). Consideration of macroeconomic uncertainty further enhances analytical depth by recognizing that financial market reactions may vary according to broader economic conditions.

Significance of this research is grounded in the increasing importance of sustainable finance within global financial systems. Corporate managers, investors, lenders, regulators, and ESG rating agencies all require greater clarity regarding the implications of rating divergence for financing outcomes (Y. Liu et al., 2025). Findings from this study are expected to contribute to theoretical debates concerning information asymmetry, signaling theory, stakeholder theory, and sustainable finance. Practical implications may assist corporations in improving disclosure practices, help creditors refine risk assessment frameworks, and support policymakers seeking to enhance transparency and credibility within ESG reporting and rating ecosystems.

RESEARCH METHOD

Research Design

This study employs a quantitative research design using a longitudinal panel data approach to examine the non-linear relationship between ESG rating discrepancies and corporate cost of debt under conditions of macroeconomic uncertainty. A quantitative approach is considered appropriate because the research seeks to measure the magnitude, direction, and statistical significance of relationships among observable financial and sustainability-related variables across a large sample of firms over multiple years. Particular emphasis is placed on identifying whether ESG rating discrepancies generate threshold effects or non-linear influences on corporate borrowing costs.

The study is grounded in the theoretical perspectives of information asymmetry, signaling theory, and stakeholder theory. ESG rating discrepancies are conceptualized as indicators of information inconsistency that may affect creditor perceptions regarding transparency, disclosure quality, and sustainability-related risks (Luo et al., 2026). Corporate cost of debt is examined as the financial outcome reflecting creditor responses to these informational signals. Macroeconomic uncertainty is incorporated as a contextual factor that may amplify or moderate the influence of ESG rating divergence on debt financing costs.

Panel regression techniques constitute the primary analytical framework of the study. Non-linear effects are examined through quadratic specifications and threshold-based modeling approaches. Additional analyses are conducted using interaction terms to assess the moderating role of macroeconomic uncertainty. Such a design facilitates a comprehensive investigation of dynamic relationships among ESG transparency, debt financing costs, and changing economic conditions over time.

Research Target/Subject

The population of this study consists of publicly listed non-financial corporations operating in major capital markets and covered by multiple ESG rating agencies. These firms are selected because they are subject to extensive disclosure requirements and regularly obtain ESG evaluations from independent rating providers. Availability of sustainability ratings, financial statements, debt-related information, and market data makes these firms appropriate units of analysis for examining the relationship between ESG rating discrepancies and financing outcomes.

Purposive sampling is employed to select firms meeting several predetermined criteria. Sampled companies must possess ESG ratings from at least two internationally recognized rating agencies, maintain complete financial reporting records during the observation period, and disclose sufficient information regarding debt obligations and sustainability performance (Qian et al., 2025). Financial institutions are excluded from the sample due to their unique regulatory environments, capital structures, and risk management frameworks that may influence debt financing characteristics differently from non-financial firms.

The final sample consists of publicly listed firms observed over a multi-year period, typically spanning ten years from 2014 to 2023. This period captures substantial developments in ESG reporting practices, sustainable finance initiatives, and episodes of heightened macroeconomic uncertainty. Inclusion of multiple industries and geographic regions enhances the representativeness of the dataset and facilitates broader interpretation of the findings within international financial markets.

Research Procedure

Data collection begins with the identification of eligible firms and retrieval of ESG ratings from recognized sustainability rating providers. Financial data are subsequently collected from annual reports, audited financial statements, and financial databases. Macroeconomic indicators are obtained from international economic institutions and publicly available databases. All collected data are screened for completeness, consistency, and reliability before inclusion in the analytical dataset.

Data processing involves several stages. Initial procedures include data cleaning, treatment of missing values, outlier detection, and variable transformation. ESG rating discrepancy measures are calculated by comparing ratings assigned by different agencies to the same firm during the same reporting period (Rossi et al., 2025). Descriptive statistics are generated to provide an overview of variable distributions and sample characteristics. Correlation analysis is conducted to identify preliminary relationships among the variables.

Inferential analysis constitutes the final stage of the research process. Panel regression models are estimated using fixed-effects and random-effects specifications, with model selection determined through appropriate statistical tests. Non-linear relationships are examined through quadratic regression models and threshold analysis techniques. Interaction effects are introduced to evaluate the moderating influence of macroeconomic uncertainty on the relationship between ESG rating discrepancies and corporate cost of debt. Robustness tests, sensitivity analyses, and diagnostic procedures are subsequently performed to ensure the validity, reliability, and stability of the empirical findings.

Instruments, and Data Collection Techniques

The primary research instrument consists of a structured data extraction framework designed to collect information from ESG databases, financial statements, corporate disclosures, and macroeconomic indicators. ESG rating discrepancy is measured using statistical dispersion indicators derived from ratings assigned by multiple ESG agencies. Measures such as absolute score differences, standard deviations, and divergence indices are utilized to capture variations in ESG assessments across rating providers.

Corporate cost of debt serves as the dependent variable and is measured using interest expense ratios, yield spreads, or effective borrowing costs reported in corporate financial statements. Independent variables include ESG rating discrepancy measures, while macroeconomic uncertainty indicators function as moderating variables (Salisu et al., 2026). Macroeconomic uncertainty is measured using established indices such as economic policy uncertainty indicators, financial market volatility measures, and macroeconomic risk indicators obtained from internationally recognized databases.

Several control variables are incorporated to improve model accuracy and reduce omitted variable bias. These variables include firm size, leverage, profitability, liquidity, asset tangibility, growth opportunities, credit ratings, and industry characteristics. Structured variable definitions and measurement procedures ensure consistency and comparability across firms and observation periods.

Data Analysis Technique

The study employs both descriptive and inferential statistical analyses to interpret the collected panel data. Descriptive statistics summarize the sample characteristics, ESG rating discrepancies, corporate cost of debt, and macroeconomic indicators, providing an initial overview of variable distributions and trends across the multi-year dataset. Correlation analysis is first performed to identify preliminary relationships among the variables, ensuring conceptual alignment before more advanced modeling.

For inferential analysis, panel regression models are applied using both fixed-effects and random-effects specifications, with model selection guided by appropriate statistical tests. Non-linear relationships between ESG rating discrepancies and corporate cost of debt are assessed using quadratic specifications and threshold-based approaches (Salisu et al., 2026). Interaction terms are incorporated to evaluate the moderating effect of macroeconomic uncertainty on these relationships. Robustness checks, sensitivity analyses, and diagnostic tests are conducted to ensure reliability, validity, and stability of the empirical findings, thereby strengthening the interpretive confidence of the study’s conclusions.

RESULTS AND DISCUSSION

The dataset consists of 4,860 firm-year observations derived from publicly listed non-financial corporations across major international capital markets during the period 2014–2023. The sample includes firms from manufacturing, technology, consumer goods, healthcare, industrial, and energy sectors that possess ESG ratings from multiple rating agencies. Descriptive analysis indicates that the average corporate cost of debt was 4.21%, while ESG rating discrepancy scores exhibited substantial variation across firms and industries. Macroeconomic uncertainty indicators also demonstrated significant fluctuations throughout the observation period, particularly during episodes of economic disruption and financial market instability.

Variation in ESG rating discrepancies suggests that sustainability assessments remain highly heterogeneous across rating providers. Approximately 27% of firms exhibited relatively low ESG divergence, 46% demonstrated moderate divergence, and 27% experienced high levels of rating inconsistency. Initial observations indicate that firms with greater ESG rating discrepancies tend to report higher borrowing costs, particularly during periods characterized by elevated macroeconomic uncertainty. Such patterns provide preliminary evidence supporting the argument that ESG transparency influences creditor perceptions and debt pricing decisions.

Table 1. Descriptive Statistics of Key Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Corporate Cost of Debt (%)	4.21	1.47	0.88	11.93
ESG Rating Discrepancy Index	0.34	0.19	0.01	0.91
Macroeconomic Uncertainty Index	112.7	36.8	48.2	238.6
Firm Size (Log Assets)	15.92	1.84	10.44	20.37
Leverage Ratio	0.46	0.18	0.07	0.89

The descriptive results indicate that ESG rating divergence is a widespread phenomenon rather than an isolated occurrence affecting only a limited number of firms. Significant variability among ESG assessments reflects differences in methodological approaches, weighting systems, indicator selection, and disclosure evaluation procedures employed by rating agencies. Such inconsistencies create informational challenges for creditors attempting to assess sustainability-related risks accurately.

Patterns observed in the data also suggest that debt markets respond to transparency-related concerns. Firms characterized by relatively consistent ESG ratings generally experienced lower borrowing costs than firms with substantial rating divergence. Creditors appear to interpret rating consistency as a signal of clearer sustainability performance and lower information asymmetry. Greater divergence, by contrast, may generate uncertainty regarding the credibility and reliability of sustainability disclosures.

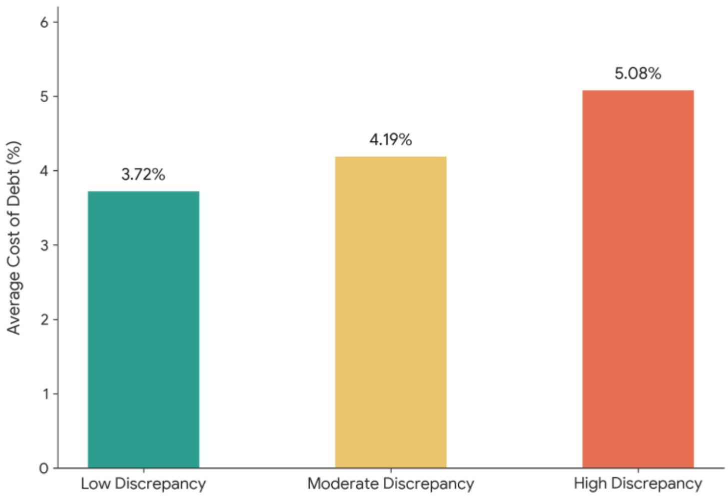

Figure 1. Average Cost of Debt across Different ESG Discrepancy Levels

Categorization of firms according to ESG discrepancy levels reveals notable differences in financing conditions. Firms within the low-discrepancy group reported an average cost of debt of 3.72%, whereas firms in the moderate-discrepancy category recorded an average borrowing cost of 4.19%. Organizations exhibiting high ESG rating divergence experienced an average cost of debt of 5.08%, suggesting a progressive increase in financing costs as rating inconsistency intensifies.

Sectoral analysis demonstrates that ESG rating discrepancies are particularly pronounced in industries facing greater environmental, social, and governance scrutiny. Energy, industrial, and consumer goods sectors displayed higher average divergence levels than technology and healthcare sectors. Borrowing cost sensitivity to ESG discrepancies also appeared stronger in industries characterized by higher exposure to sustainability-related risks and stakeholder expectations.

Panel regression results reveal a statistically significant relationship between ESG rating discrepancies and corporate cost of debt. The coefficient associated with ESG divergence is positive and significant at the 1% level, indicating that greater inconsistency among ESG ratings is associated with higher borrowing costs. Findings support the argument that creditors incorporate ESG transparency considerations into debt pricing decisions and perceive rating divergence as a risk-enhancing factor.

Quadratic regression analysis further identifies a significant non-linear relationship between ESG rating discrepancies and financing costs. Results indicate that borrowing costs increase gradually at lower levels of rating divergence but accelerate substantially beyond a critical threshold (Zuo & Xie, 2026). Such findings suggest that creditors tolerate moderate levels of inconsistency; however, severe divergence generates disproportionately stronger negative reactions. Evidence therefore supports the existence of threshold effects within debt market responses to ESG-related information ambiguity.

Interaction analysis demonstrates a significant relationship between ESG rating discrepancies and macroeconomic uncertainty. Firms experiencing high levels of ESG divergence during periods of elevated economic uncertainty faced substantially higher borrowing costs than firms operating under stable macroeconomic conditions. Such results indicate that the informational consequences of ESG inconsistency become more pronounced when creditors confront broader economic risks.

Relationships among the variables also reveal that firm-specific characteristics influence the strength of observed effects. Larger firms and organizations with stronger financial performance generally experienced lower sensitivity to ESG divergence than smaller or financially constrained firms (Zhu et al., 2026). Financial strength appears to partially mitigate the negative consequences of rating inconsistency; however, the influence of transparency-related concerns remains statistically significant across all model specifications.

Case study analysis was conducted on three multinational corporations operating in sustainability-sensitive sectors. The first case involved a renewable energy company exhibiting relatively consistent ESG ratings across providers (Y. Zhou & Zhang, 2025). The second case focused on a manufacturing corporation characterized by moderate ESG divergence. The third case examined an industrial firm experiencing substantial discrepancies among ESG assessments issued by different rating agencies.

Examination of these cases revealed clear differences in creditor responses. The renewable energy company maintained relatively stable borrowing costs despite fluctuations in macroeconomic conditions. The manufacturing firm experienced moderate increases in debt financing costs corresponding to rising ESG divergence (J. Zhou & Lei, 2025). The industrial firm encountered the highest financing costs, particularly during periods of heightened economic uncertainty. These patterns align closely with the broader empirical findings obtained from the panel dataset.

Analysis of the selected cases suggests that rating consistency functions as a proxy for informational transparency. Firms demonstrating coherent ESG assessments across providers generally provide more comprehensive disclosures and maintain stronger sustainability reporting practices. Such characteristics reduce information asymmetry and facilitate more accurate creditor evaluations of sustainability-related risks.

Differences observed among the case firms also highlight the role of macroeconomic conditions in shaping debt market reactions. During periods of economic stability, creditors appear more willing to tolerate moderate ESG divergence (Zhong et al., 2025). Conditions of uncertainty, however, intensify risk sensitivity and increase the importance of transparent and consistent sustainability information. ESG discrepancies therefore become more influential when external economic conditions amplify concerns regarding future corporate performance.

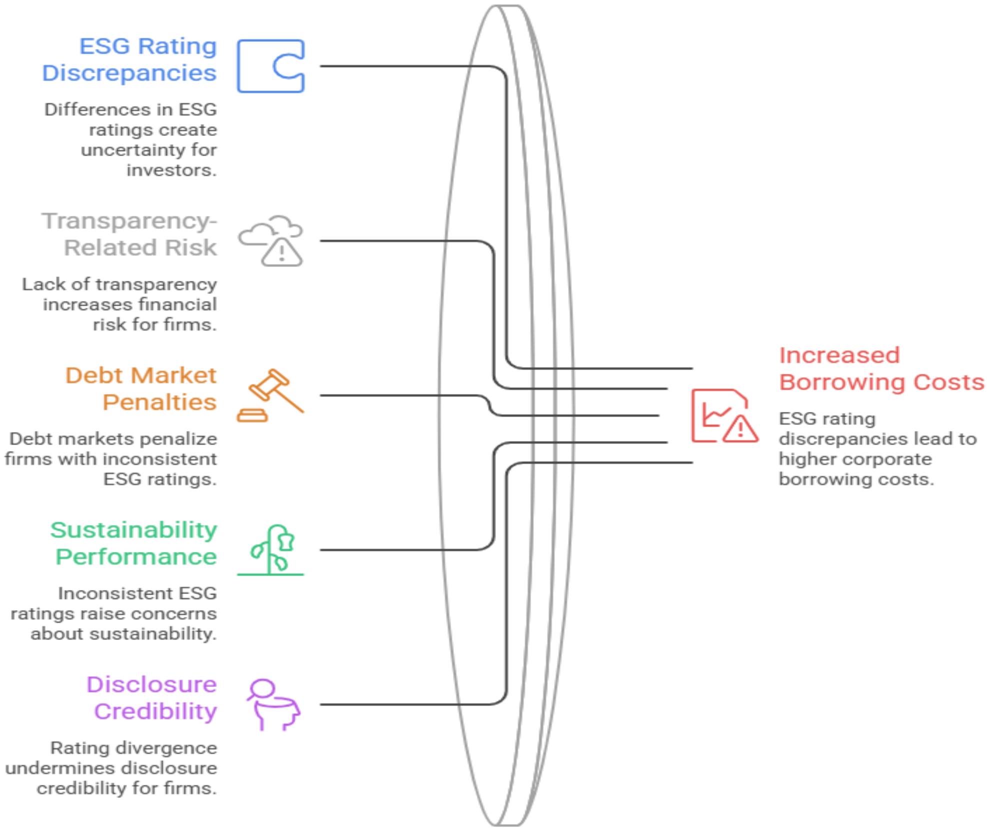

Figure 2. Impact of ESG Rating Discrepancies on Corporate Cost of Debt under Transparency and Sustainability Factors

Overall findings indicate that ESG rating discrepancies represent a meaningful determinant of corporate borrowing costs and should be viewed as indicators of transparency-related risk rather than merely methodological differences among rating providers (Zhao et al., 2025). Debt markets appear to penalize firms exhibiting substantial rating divergence because inconsistencies increase uncertainty regarding sustainability performance and disclosure credibility. Such evidence highlights the growing financial significance of ESG transparency within contemporary capital markets.

Interpretation of the results further suggests that the relationship between ESG rating discrepancies and cost of debt is fundamentally non-linear and highly sensitive to macroeconomic conditions. Moderate levels of divergence generate relatively limited financial consequences, whereas severe discrepancies trigger disproportionately stronger creditor reactions. Macroeconomic uncertainty amplifies these effects by increasing the value of reliable information and intensifying creditor sensitivity to ambiguity. Findings therefore support the existence of a transparency premium within debt markets, whereby firms providing clearer and more consistent sustainability signals benefit from lower financing costs.

The findings demonstrate that ESG rating discrepancies exert a significant influence on corporate cost of debt, indicating that creditors increasingly incorporate sustainability-related information into their risk assessment processes (Zaman et al., 2025). Firms exhibiting greater divergence among ESG ratings consistently faced higher borrowing costs than firms characterized by more consistent sustainability evaluations. Such evidence suggests that debt markets interpret ESG rating discrepancies as indicators of information uncertainty and potential transparency concerns.

The results further reveal that the relationship between ESG rating discrepancies and corporate cost of debt is not linear. Borrowing costs do not increase proportionally as rating divergence rises. Moderate discrepancies generate relatively limited financial consequences, whereas substantial inconsistencies trigger disproportionately stronger increases in financing costs. Such findings indicate the existence of threshold effects in creditor responses to sustainability-related information ambiguity.

Macroeconomic uncertainty emerged as an important contextual factor shaping the magnitude of these effects. Periods characterized by elevated economic volatility strengthened the positive association between ESG rating discrepancies and borrowing costs (Yuan & Bao, 2025). Creditors appeared more sensitive to transparency-related concerns when broader economic conditions increased uncertainty regarding future corporate performance and financial stability.

Case study evidence reinforced these statistical findings by demonstrating that firms maintaining more consistent ESG evaluations generally experienced more favorable financing conditions. Organizations characterized by substantial ESG divergence encountered higher borrowing costs, particularly during economically turbulent periods. Such patterns support the argument that transparency and information consistency have become increasingly valuable assets within contemporary debt markets.

The findings are broadly consistent with previous studies examining the relationship between ESG performance and financing costs. Existing literature frequently suggests that firms demonstrating stronger ESG profiles benefit from lower capital costs due to reduced perceptions of environmental, social, and governance risks. Evidence generated in this study supports the broader argument that sustainability-related information plays an increasingly important role in financial market decision-making.

Research concerning information asymmetry and corporate transparency also aligns closely with the present findings. Previous studies have consistently demonstrated that greater informational clarity reduces uncertainty and facilitates more efficient capital allocation. Findings from this study extend these insights by demonstrating that ESG rating consistency functions as a transparency signal influencing creditor evaluations and debt pricing decisions.

Differences emerge when comparing the present findings with earlier ESG studies that rely primarily on single-provider ESG scores (Tao et al., 2025). Traditional research often assumes that ESG ratings accurately represent sustainability performance and can be treated as objective indicators. Findings from this study suggest that divergence among ESG ratings constitutes an important informational characteristic in its own right. Debt markets appear to respond not only to ESG levels but also to inconsistencies among assessments.

The study also advances existing scholarship by identifying non-linear dynamics that have received limited attention in prior research. Previous investigations frequently employ linear models when examining ESG-related financial outcomes. Findings indicate that creditor responses intensify once ESG rating discrepancies exceed certain levels, suggesting that threshold effects are important for understanding how sustainability-related information influences financing conditions.

The findings signify that transparency has evolved into a financially valuable corporate asset rather than merely a compliance requirement. Creditors increasingly view consistent sustainability information as an indicator of governance quality, managerial credibility, and risk management effectiveness. Firms capable of communicating coherent ESG performance signals appear better positioned to secure favorable financing terms.

The results also signify that ESG ratings are no longer perceived solely as sustainability indicators but have become important informational intermediaries within financial markets. Rating discrepancies influence market perceptions because they shape creditor confidence regarding the reliability of corporate disclosures (Tu et al., 2025). Such developments illustrate the growing integration of sustainability assessments into mainstream financial decision-making processes.

Patterns observed throughout the analysis further signify a broader transformation in how debt markets evaluate risk. Traditional financial indicators such as leverage, profitability, and liquidity remain important; however, non-financial information increasingly contributes to creditor assessments. ESG transparency has emerged as a complementary dimension influencing perceptions of long-term organizational stability and resilience.

Broader interpretation suggests that contemporary financial markets are entering a phase in which informational quality and sustainability credibility are becoming central determinants of financing outcomes. Firms operating within uncertain economic environments may therefore derive substantial competitive advantages from maintaining transparent, consistent, and reliable sustainability disclosures. Such developments reflect the growing institutionalization of ESG considerations within global capital markets.

The findings have important implications for corporate managers and sustainability practitioners. Organizations should recognize that inconsistencies among ESG ratings may generate tangible financial consequences. Efforts to improve disclosure quality, enhance reporting transparency, and strengthen communication with rating agencies may contribute to reducing borrowing costs and improving access to capital.

Implications are equally significant for creditors and financial institutions. Risk assessment frameworks should account not only for ESG performance levels but also for the degree of agreement among rating providers. ESG rating divergence may provide valuable information regarding disclosure quality, informational uncertainty, and potential governance risks. Incorporating such considerations may improve the accuracy of lending decisions and portfolio risk management strategies.

Regulators and policymakers may also derive important insights from these findings. Significant ESG rating discrepancies indicate ongoing challenges associated with methodological fragmentation and reporting inconsistency. Regulatory initiatives promoting disclosure standardization, reporting harmonization, and greater transparency among rating agencies may contribute to more efficient market outcomes and improved information quality.

Academic implications emerge from the need to further explore the mechanisms through which sustainability-related information influences financial decision-making. Findings demonstrate that ESG transparency extends beyond environmental and social performance considerations and directly affects financing conditions. Future research should therefore continue examining ESG-related informational characteristics as determinants of market behavior.

The observed findings can largely be explained through information asymmetry theory. Creditors possess limited direct knowledge regarding a firm's actual sustainability performance and therefore rely on external signals to assess risk. ESG rating discrepancies increase uncertainty because they generate conflicting interpretations of organizational sustainability practices. Higher uncertainty naturally leads creditors to demand risk premiums in the form of increased borrowing costs.

Signaling theory provides a second explanation for the results. Consistent ESG ratings communicate credibility, transparency, and managerial competence. Divergent ratings, by contrast, may signal incomplete disclosures, measurement ambiguities, or governance weaknesses. Creditors respond to these signals by adjusting their perceptions of organizational risk and incorporating those perceptions into debt pricing decisions.

Macroeconomic uncertainty further amplifies these effects because economic instability increases the value of reliable information. During periods of financial volatility, creditors become more cautious and place greater emphasis on indicators capable of reducing uncertainty. ESG rating consistency functions as one such indicator, while rating divergence becomes increasingly problematic due to heightened concerns regarding future corporate performance.

Institutional differences among ESG rating providers also contribute to the observed outcomes. Variations in methodologies, weighting systems, data collection procedures, and evaluation criteria create discrepancies that complicate interpretation. Creditors confronted with conflicting sustainability assessments may adopt more conservative risk evaluations, thereby increasing borrowing costs for firms characterized by greater rating divergence.

Future corporate strategies should prioritize greater ESG disclosure consistency and enhanced engagement with sustainability rating agencies. Organizations may benefit from developing integrated reporting systems capable of improving data quality, reducing informational inconsistencies, and strengthening stakeholder confidence. Such efforts may contribute not only to reputational benefits but also to measurable financial advantages.

Development of global sustainability reporting standards represents another important priority. Greater harmonization of disclosure frameworks and rating methodologies may reduce informational fragmentation and improve comparability across firms and industries. Enhanced consistency would facilitate more accurate assessments by creditors, investors, and other market participants.

Research should increasingly investigate the mechanisms through which ESG rating discrepancies influence different forms of financing. Existing evidence primarily focuses on debt and equity markets, whereas less attention has been devoted to sustainable bonds, green financing instruments, syndicated loans, and alternative funding arrangements. Examination of these areas may provide deeper insights into the broader financial implications of ESG transparency.

Long-term evolution of sustainable finance will likely depend upon the ability of corporations, regulators, rating agencies, and financial institutions to create more transparent and reliable information ecosystems. Effective coordination among these stakeholders may reduce informational uncertainty, strengthen market efficiency, and support the continued integration of sustainability considerations into financial decision-making processes. Transparency is therefore likely to remain a critical determinant of corporate financing outcomes in increasingly uncertain economic environments.

CONCLUSION

The most important finding of this study is that ESG rating discrepancies constitute a distinct transparency-related risk factor that significantly influences corporate cost of debt, particularly under conditions of heightened macroeconomic uncertainty. Findings reveal that the relationship between ESG rating divergence and borrowing costs is fundamentally non-linear rather than proportional. Moderate discrepancies generate relatively limited financial consequences, whereas substantial divergences trigger disproportionately larger increases in debt financing costs. Macroeconomic uncertainty further intensifies this relationship, indicating that creditors place greater value on transparent and consistent sustainability information when economic conditions become unstable. These results suggest that debt markets reward informational clarity and penalize sustainability-related ambiguity, thereby creating a measurable transparency premium within corporate financing decisions.

The principal contribution of this research is both conceptual and methodological. Conceptually, the study advances sustainable finance literature by repositioning ESG rating discrepancies from a measurement inconsistency issue to a meaningful indicator of informational transparency and creditor-perceived risk. Methodologically, the incorporation of non-linear modeling and interaction analysis with macroeconomic uncertainty extends conventional approaches that typically assume linear relationships between ESG factors and financing outcomes. Integration of information asymmetry theory, signaling theory, and sustainable finance perspectives provides a more comprehensive framework for understanding how ESG-related information affects debt market behavior and corporate borrowing costs.

Several limitations should be acknowledged when interpreting the findings of this study. Reliance on ESG ratings from selected providers and publicly listed firms may limit the generalizability of the results across different institutional settings, private firms, and emerging financial markets. Variations in ESG methodologies, regulatory environments, and disclosure practices may also influence the magnitude of observed effects. Future research should investigate cross-country differences in ESG transparency, explore industry-specific threshold effects, and examine the role of evolving sustainability reporting standards in reducing rating divergence. Longitudinal studies incorporating artificial intelligence-based ESG assessments, sustainable debt instruments, and alternative measures of information quality may further enhance understanding of the complex relationship between ESG transparency and corporate financing outcomes in increasingly uncertain economic environments.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used QuillBot to assist in improving grammar, language quality, and overall readability of the text. After using this tool, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the content of the publication.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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