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Research Article

ESG and Financial Distress in Indonesian Non-Financial Firms: The Moderating Role of Cost of Debt

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Abstract: This study examines how Environmental, Social, and Governance (ESG) performance influences financial distress, incorporating cost of debt as a moderating variable. Financial distress is proxied by the Interest Coverage Ratio (ICR), reflecting a firm's capacity to satisfy interest payments. The empirical sample consists of 655 firm-year observations of non-financial companies listed on the Indonesia Stock Exchange from 2014 to 2023. Panel regression with fixed effects and heteroskedasticity-consistent estimation (Panel EGLS with cross-section weights) is employed to analyze the data. Results indicate that ESG performance exerts a positive and statistically significant effect on ICR ($\beta = 0.1189$; $p < 0.01$), implying that firms with robust ESG practices are better able to service their debt and thus face lower financial distress. Additionally, the interaction term between ESG and cost of debt yields a negative and significant coefficient ($\beta = -0.9714$; $p < 0.05$), suggesting that elevated financing costs attenuate the beneficial impact of ESG on financial resilience. These findings are consistent with stakeholder theory, which advocates that proactive engagement with stakeholders enhances corporate stability, and trade-off theory, which underscores the necessity of balancing debt advantages against financial risk. This research contributes to the literature by demonstrating the conditional effect of cost of debt on the ESG–financial distress nexus. From a managerial perspective, the study underscores the importance of integrating ESG initiatives with cost-efficient funding strategies to mitigate financial distress risk and foster sustainable, long-term value creation.

Keyword: ESG Performance; Financial Distress; Interest Coverage Ratio; Cost of Debt; Panel Regression analysis.

1. Introduction

Financial distress can be influenced not only by internal financial metrics but also by how firms strategically manage their relationships with stakeholders and external financiers. According to stakeholder theory (Freeman et al., 2010), firms that meet stakeholders' expectations through sustainable practices can reduce reputational and operational risks, thus decreasing their likelihood of financial distress. Signaling theory further supports this view, suggesting that ESG practices serve as positive signals to creditors and investors, reflecting managerial quality and long-term risk mitigation (Choudhury, 2024; Lee et al., 2022).

Furthermore, the trade-off theory explains that firms balance the tax benefits of debt with the increased risk of financial distress from overleveraging. In this context, the cost of debt becomes a crucial moderator in the ESG–financial distress relationship. Recent empirical studies such as Habib (2023), Song et al. (2024), and Zhang & Li (2023) emphasize the need to consider financial structure when evaluating the real impact of ESG on firm risk, particularly in emerging markets.

Economic challenges are also felt in Indonesia. In early 2025, companies such as Stritek Group, PT. Sanken Indonesia, Yamaha Music Indonesia, PT. Tokai Kagu Indonesia, PT Bapintri and several other companies are reportedly bankrupt (Kompas.com. 2025). In 2024, several startup companies will go bankrupt such as Zenius, Airt room, JD. ID and Sorabel (CNBC Indonesia. 2024). Recently, eFishery, a startup company with Unicorn status, faced a scandal because it polished financial statements to look healthy in the eyes of investors. This

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scandal was carried out because eFishery was facing financial difficulties (Kompas.Com 2025). This is certainly bad news because it will have an impact on the termination of tens of thousands of employees. Therefore, understanding the various factors that affect the occurrence of financial difficulties or financial *distress* of companies is important to do.

Financial distress is a situation where a company experiences financial difficulties that cause the company to likely experience an inability to pay obligations both long-term and short-term. In the end, this condition will lead the company to bankruptcy and liquidation. Ahmad (2013) revealed that (Zhao et al., 2024) *financial distress* is influenced by various fundamental financial factors in the company. These fundamental factors are profitability, liquidity and leverage. In addition, educational background and management experience also affect the company's *financial distress*. Wijaya et al (2023) in his research revealed that in addition to fundamental factors, there are also managerial factors such as ownership concentration that affect financial distress. The greater the concentration of ownership, the smaller the agency's costs. On the other hand, if the concentration of ownership is spread, the agency's costs will be even greater. Large agency fees affect *financial distress.*

Freeman et al (2010) explained that in the Stekholder theory approach, the sustainability of the company is influenced by how the company is able to meet the expectations of stakeholders. Stakeholders in intelligence are explained as all parties related to the company. Some of them are capital owners, management, workers and the community. Stakeholder theory is the emergence of the concept of corporate social responsibility (CSR). The concept of CSR is closely related to the development of ESG concepts. In this context, the company will have resilience to *Financial Distress* if the company is able to meet the obligations of stakeholders. These stakeholders include environmental, social and governance aspects.

Attention to the challenge of answering sustainability issues is increasing. This is shown by the emergence of the concept of environmental, social, environmental (ESG) and the obligation of companies to report the company's contribution in sustainability reports. According to the International Financial Corporation (2021), *Environmental* refers to how a company's operational activities are affected and influenced by environmental factors, such as energy use, carbon emissions, waste management, natural resource conservation, and biodiversity conservation initiatives. While Social is concerned with the company's responsibility to stakeholders *(Source: Wikimedia T*), including employees, consumers, local communities, suppliers, as well as broader issues such as human rights, health, occupational safety, and inclusivity. Last *Governance* focuses on corporate governance systems and structures, which include transparency, accountability, business ethics, protection of minority shareholder rights, and fair decision-making mechanisms. Until now, various institutions have developed various indicators to measure ESG. International institutions such as Bloomberg and Revinitif measure the ESG scores of companies around the world.

Considering ESG factors will improve the return of a portfolio?

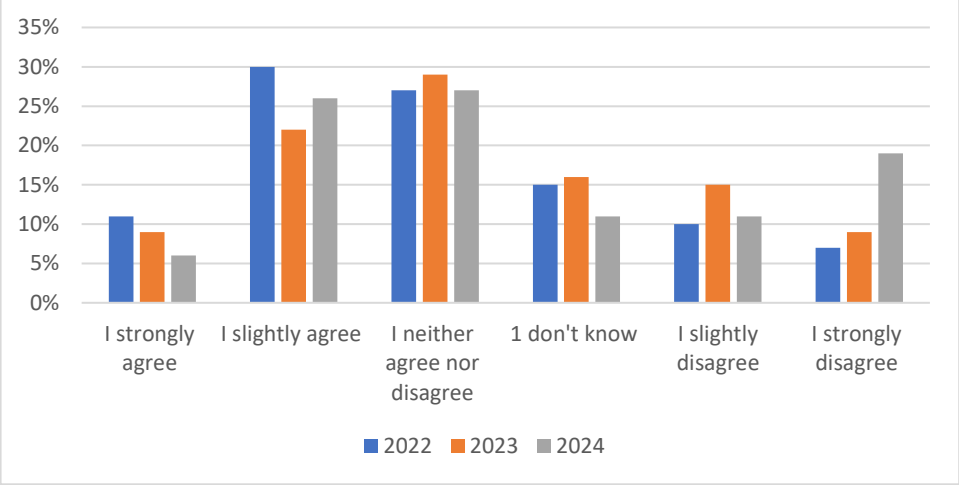


Figure 1 Deutsche Bank AG. Data as of November 2024.

In 2024, Deutsche Bank conducted a survey to understand market participants' responses to ESG. The survey also shows market participants' perceptions of the impact of ESG on profits or returns earned from their portfolios. A comparison of surveys from 2022 to 2024 shows inconsistent results. In 2022, the majority of respondents agreed that ESG affects the returns earned from their portfolios. However, in 2023, the majority of respondents answered that they did not know whether ESG had an effect on the returns

earned from their portfolios. Meanwhile, in 2024, respondents who are skeptical and agree about the influence of ESG on the returns obtained from their portfolios are quite balanced. This shows that the expectation of ESG's influence on returns is not high.

Investing based on ESG factors can help to manage risk in a portfolio

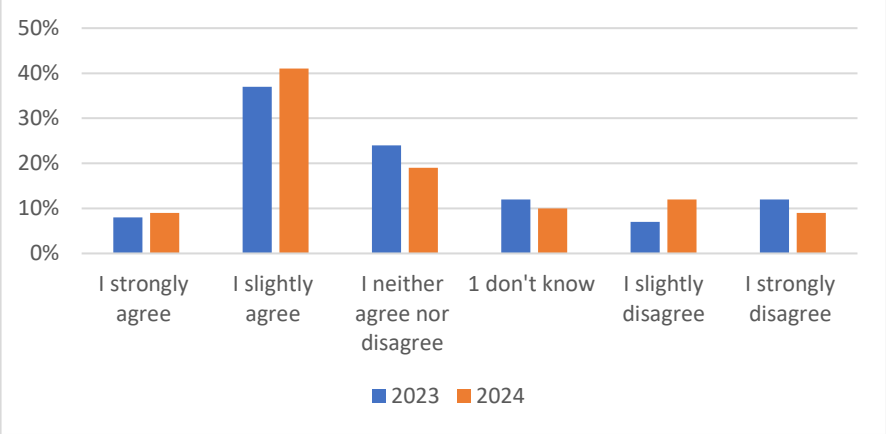


Figure 2 Deutsche Bank AG. Data as of November 2024

In contrast to market participants' perceptions of the impact of ESG on profits or returns, market participants' perceptions of the influence of ESG on risk management are quite consistent. The majority of respondents believe that ESG can help in the risk management aspect of their portfolios. This optimism occurs in both surveys in 2023 and 2024. Not only that, this optimism also tends to increase from 2023 to 2024. On the other hand, respondents who had a pessimistic perception and answered did not know that there was a decline. This shows that the majority of actors use ESG as a factor that helps them manage risk in structuring their portfolios.

Zhou et al. (2022) revealed that improving ESG performance has an effect on improving the company's financial performance and company value. This relationship occurs with the mechanism Financial performance becomes a mediating factor that connects ESG and company value. Wang X. & Yao L. (2023) explained that ESG also affects the reduction of financial (Zhou et al., 2022) *constraints*. These findings were obtained by using company transparency and investor sentiment as mediation variables. ESG can increase corporate transparency and increase investor satisfaction sentiment. Transparent disclosure of ESG scores encourages internal investors to make investments. This then allows the company to get investment funds and strengthen the company's finances (Wang X. & Yao L., 2023).

Another study conducted by Fauzi (2022) also shows that companies with good environmental performance have better financial performance and are more resistant to economic shocks. This means that companies with good ESG performance have a greater chance of surviving in the long term and reducing the risk of bankruptcy. Transparent disclosure of financial information is part of good ESG governance performance can improve a company's investment efficiency (Fauzi, 2022).

Ruan and Liu (2021) revealed that in sectors such as mining, ESG disclosures have a limited influence on company performance. This suggests that industry characteristics, especially in environmentally sensitive sectors, can influence the relationship between ESG and a company's financial performance. Another study conducted by Iriangningsih et.al (2024) on companies in ASEAN also produced counter results. The findings of this study led to the conclusion that ESG has no relationship with investment efficiency in ESG-sensitive companies. This finding is interesting, especially since the sample of companies that are the object of the research represent conditions in developing countries. In Indonesia itself, ESG research has been carried out quite a lot. (Ruan & Liu, 2021) Safitri & Utomo (2020) explain that the disclosure of ESG scores has a significant impact on financial performance.

The mechanism of the relationship between ESG and financial distress still needs to be explored. One of the things that needs to be considered is the role of cost of debt as a factor that moderates the relationship between ESG and financial distress. Debt cost is the rate of return or interest that a company must pay to creditors on borrowed funds. The greater the cost of debt as the greater the financial risk faced by the company. Debt costs are one of the *leading indicators* of the company's financial condition. A reduction in debt costs can allow companies to obtain better liquidity to run operations, take advantage of investment opportunities, and withstand potential bankruptcy. Therefore, understanding this moderation mechanism can open up new insights into how to mitigate financial risks through more

specific financial channels. Looking at various presentations of various existing studies, the author sees that research on the relationship between ESG and financial indicators still needs to be explored. Therefore, in this study, the author wants to conduct a study on the influence of ESG on financial distress with cost of debt as a moderation factor (Shang & Harford, 2020).

2. Literature Review

ESG and Financial Distress

Recent literature has reinforced the connection between ESG performance and firm risk outcomes. Habib (2023) and Zhang & Li (2023) provide evidence that high ESG scores reduce firm default risk and borrowing costs. Song et al. (2024) illustrate that ESG can serve as a buffer against distress during macroeconomic downturns. Fatemeh et al. (2022) show that strong ESG practices in emerging markets correlate with lower bankruptcy probability.

These findings support the relevance of stakeholder theory and signaling theory in the ESG-financial distress context. ESG efforts reflect managerial quality and transparency, fostering investor trust and operational stability. Trade-off theory also explains how higher cost of debt may reduce ESG's risk-reducing effect, making COD a relevant moderator in this study.

ESG has three main components, namely *environmental, social* and *governance.* Companies that operate with environmentally friendly practices (e.g., lowering carbon emissions, managing waste well) tend to reduce the risk of environmental liability and legal sanctions. From the creditor's perspective, this lowers the potential for unexpected costs in the future. Furthermore, on the social aspect. Issues of employee welfare, occupational safety, and social responsibility affect operational stability. Companies that maintain good relations with employees and the surrounding community typically experience less turmoil (e.g. strikes, social conflicts). This stability increases creditors' confidence that the company's cash flow will be more secure. Finally, in the aspect of *governance.* Good governance (reporting transparency, management accountability, protection of minority shareholders, etc.) reduces agency risk and *fraud.* If the company's governance is strong, creditors will feel safer disbursing funds and assess the default *risk* as lower (Fu et al., 2021)

From the theoretical aspect, *Stakeholder theory* states that companies do not operate in a vacuum, but rather must consider the interests of various stakeholders such as employees, communities, suppliers and governments (Freeman et al., 2010). By meeting stakeholders' expectations in terms of ESG, companies can reduce conflicts and increase social support. Creditors assess this broad support as reducing business risk, so that debt costs can be reduced. Meanwhile, the influence of ESG can also be explained by *signalig theory*. ESG performance can be considered as a "quality signal" to external parties. By disclosing ESG data (e.g., emission reduction targets, sustainable CSR programs, independent board structure), companies demonstrate their seriousness in reducing long-term risks. This positive signal adds to creditors' confidence, so they are willing to offer loans at lower fees.

Several studies show a significant link between ESG and finance *Distress* . Research conducted by Song et al (2024) on energy companies shows that ESG can effectively be used as an indicator to predict the risk of corporate financial difficulties. This finding is important considering that the energy sector is a sector that is considered sensitive to ESG performance. In this study, the sentiment towards companies that disclose ESG data affects the company's financial risk. Another study conducted by Habib (2023) showed results that strengthen the argument for the relationship between ESG and (Song Et al., 2024) *financial distress.* This research suggests that underperformance ESG can play a role as a factor that mitigates the risk of corporate financial difficulties. Wang & Yao (2023) reveal that ESG performance can help companies in reducing the risk of financial constraints (*financial constrains).* This happens because ESG disclosures can improve company transparency and increase positive sentiment from investors. From various presentations of various findings of previous research in this study, the hypothesis is formulated that ESG performance has a significant negative effect on *Financial Distress*. The better the ESG performance of a food company, the lower the risk *Financial Distress* that the company will experience. Some of the studies above show that ESG has an effect in reducing the financial barriers faced by companies. The loss of financial barriers will prevent companies from being in financial distress. Therefore, in this study, the hepotesis was formulated as follows:

H1 = ESG reduces the risk of companies experiencing financial distress

The Effect of Cost Of Debt on ESG Relations and Financial Distress

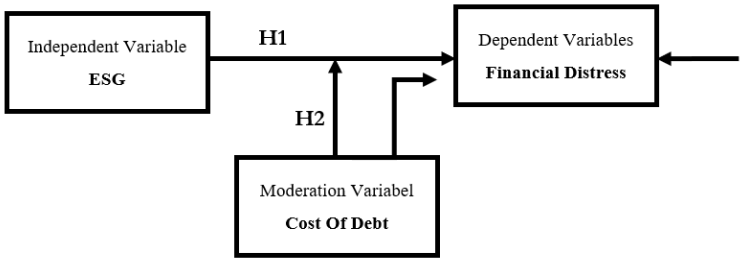
The cost of debt is the interest rate that the company must pay to the lender (creditor) on the borrowed funds. The higher the interest rate that must be paid, the greater the debt cost that the company bears. Companies with capital structures that are more financed by debt typically have higher financial risks because fixed *costs* (interest expenses) increase. Meanwhile, the risk of bankruptcy is the possibility that the company will not be able to meet its financial obligations (default on interest or principal loans). If the company experiences cash flow constraints or inadequate profits, the company can be pushed to the brink of bankruptcy.

As the portion of debt increases, the interest burden will also increase. High interest expense can reduce a company's net profit and reduce the company's ability to meet short-term and long-term obligations. If the market sees that the company has a capital structure that is too *Leverage* (high debt-to-equity ratio), the interest rate required by creditors will rise. This is because creditors assess the risk of default of the company higher, so they ask for greater rewards (interest). Large interest expenses can force companies to divert funds that should be for investment or operational activities in order to grow their business, precisely to pay interest costs. If this condition continues to occur, *Financial Distress* (financial difficulties) are getting higher, and in the end the risk of bankruptcy increases.

Small changes in *the cost of debt* can have a significant impact on the increased risk of *default* in the medium and long term. Furthermore, the overly aggressive capital structure (high debt) increases the sensitivity of companies to interest rate hikes. This shows the importance of a dynamic approach in determining the capital structure to avoid the pitfalls of (Huong et al., 2023) *financial distress*. The strong relationship between debt costs and risk has also been empirically proven from several studies. Zhang & Li (2023) in the study found several things. First, the increase in *cost of debt* (higher interest rates) is positively correlated with an increase in the risk of bankruptcy. Second, companies that face high debt costs tend to limit their capital expenditures (investments) because they are worried that they will not be able to meet their interest payment obligations in the future. Third, management needs to balance the use of debt for investment financing and the *risk of financial distress* caused (Zhang & Li, 2023).

Bao & Nguyen's (2022) research on companies in developing countries also found conclusions that are not much different. First, with the decrease in *the cost of debt,* the risk of corporate bankruptcy in emerging markets also tends to decrease. Second, a more independent board of directors is related to reducing the *cost of debt* because it increases investor and creditor confidence. Third, *strong corporate governance* represented by an independent board of directors acts as a controlling mechanism to minimize management opportunistic behavior and increase financial transparency. Departing from some of these arguments, in this study, cost of debt is used as a variable that is able to moderate the relationship between ESG and financial distress. Companies that have high costs will weaken the relationship between ESG and financial distress (Bao & Nguyen, 2022).

H2 : Cost of debt moderates the relationship between ESG and Financial Distress.



3. Proposed Method

This study uses a sample of 655 firm-year observations from 72 non-financial companies listed on the Indonesia Stock Exchange (IDX) between 2014 and 2023. Sample selection was based on the availability of ESG scores from Bloomberg and firm classification within the IDX ESG Leaders index.

To examine the moderation effect of cost of debt, a panel regression model with interaction terms was used. The dependent variable is financial distress proxied by the Interest Coverage Ratio (ICR), while ESG score is the main independent variable. The cost of debt

(COD) moderates the relationship through an interaction term (ESG × COD). Control variables include profitability (ROA), liquidity (CR), and firm size (log of total assets).

Diagnostic tests included the Chow test to confirm the use of fixed effects, the Hausman test to validate model selection, and heteroskedasticity correction using White robust standard errors. Analysis was conducted using EViews 13 software.

The unit of analysis and company sample in this study was determined by the *Purpose Sampling*. This technique is a sampling method by considering the criteria that have been set. The criteria used are companies that have ESG value in Non-Financial companies listed on the Indonesian stock exchange from 2014-2023. This sampling is based on the availability of corporate ESG data available on Bloomberg. There were a total of 655 observation objects in this study (Sugiarto, 2017).

Analysis and Data Collection Techniques

The data used in this study are secondary data. Secondary data is data that has been collected and compiled by other parties for research purposes or other purposes, which is then reused by researchers for further analysis. This data usually exists in the form of documents, reports, statistics, publications, or archives published by institutions or individuals who have authority or relevance to the topic being researched Data collection techniques are carried out by utilizing various open information related to the company's annual financial statements on the Indonesia Stock Exchange. In addition, this study uses ESG data provided by Bloomberg (Jogiyanto, 2024).

This study uses several data analysis methods and techniques to answer research formulations and prove hypotheses. Data analysis techniques in research can be carried out with various methods, depending on the type of data collected and the purpose of the research (Jogiyanto, 2024). There are several stages of data analysis in this study. The first is descriptive analysis. The second stage is Panel Data Regression Analysis. In panel data regression analysis, the first step is to determine the panel data model. The second step is to perform a classical assumption test. The third step is to perform a hepotesis test with panel data regression.

Operationalization of Vriabel
Dependent Variables

In this study, the Dependent variables studied are *Financial Distress*. *Financial distress* can be described as a condition in which a company is unable to meet its financial obligations, which can lead to liquidation or restructuring (Altman et al., 2019). In this study, the *Financial Distress* calculated using the Interest coverage ratio method. This method is one way to measure the company's ability to meet interest obligations on debt. This method is used to detect the company's financial condition, namely risk *Financial Distress*. If the ICR is low, the company is considered to have potential risks *Financial Distress* higher. ICR is measured by the following formula:

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Beban Keuangan}}$$

Independent Variable

The Independent variables used in this study are *Environmental, Social* and *Governance* (ESG). In the ESG value research, the ESG value used comes from secondary data in the form of an ESG score assessor provided by Bloomberg. The ESG score data provided by Bloomberg comes from an assessment of various indicators in environmental, social and governance aspects. The indicators are compiled to assess the extent to which the company's management pays attention to the quality of environmental, social and governance aspects in operating the company. Bloomberg provides assessments individually and in combination on environmental, social and governance (ESG) aspects. This rating is measured on a scale of 1-100. The higher the score, the better the company's management will pay attention to environmental, social and governance (ESG) aspects. Likewise, vice versa, the lower the score, the more it shows the high risk of the company's operations to the environmental, social and governance aspects.

ESG itself is a combination of three pillars, namely environmental, social, and governance. The environmental pillar has the following indicators: carbon footprint, energy consumption, water and waste management, climate change strategy and environmental policy. The Social Pillar has the following indicators of gender and ethnic diversity, employee

development training, occupational health and safety, trade union relations, community engagement and involvement. The governance pillar has the following indicators: composition of the board of directors, management remuneration, anti-corruption policies and code of ethics, shareholder voting rights, and ownership structure. The following is the formula for calculating ESG value.

$$\text{ESG Score} = \frac{\text{Indikator ESG yang diungkapkan}}{\text{Total indikator yang relevan}} \text{ x } 100$$

$$\text{Enveronmental Score} = \frac{\text{Indikator ESG yang diungkapkan}}{\text{Total indikator yang relevan}} \text{ x } 100$$

$$\text{Social Score} = \frac{\text{Indikator ESG yang diungkapkan}}{\text{Total indikator yang relevan}} \text{ x } 100$$

$$\text{Score} = \frac{\text{Indikator ESG yang diungkapkan}}{\text{Total indikator yang relevan}} \text{ x } 100$$

Moderation Variables

Debt costs *(cost of debt)*) refers to all expenses related to loans taken out by the company, including interest paid to creditors, transaction fees, and other costs associated with the process of acquiring and managing. The measurement of debt costs in this study refers to the measurement of *cost of debt* conducted by Shin et, al (2024). Where the cost of debt is calculated by the ratio between total liabilities *Financial Cost / Financial Expenses* to total liability. This measurement is based on the explanation that *Financial Cost* (financial expenses) is a component in the income statement that reflects the burden that the company must bear related to debt financing activities.

$$\text{Cost Of Debt} = \frac{\text{Beban Keuangan}}{\text{Total Liabilitas}}$$

Control Variables

In this study, three control variables were used, namely profitability and liquidity. Profitability is a company's ability to generate profits from its operational activities. As a control variable, profitability is used because it can affect financial performance and managerial decisions. The profitability indicators in this study are *Return on Assets* (LENGTH).

$$\text{ROA} = \frac{\text{laba Bersih}}{\text{Total Aset}}$$

Liquidity refers to a company's ability to meet its short-term obligations (current debt) with its current assets. The higher the liquidity, the greater the company's ability to pay its debts at maturity without experiencing financial difficulties. In this study, liquidity is measured by the current ratio. Here is the current ratio formula.

$$\text{Current Ratio} = \frac{\text{Aset Lancar}}{\text{Liabilitas Lancar}}$$

3.2.4. Research Model

In the study, two regression models were prepared to answer the test of hepotesis in the study. The first model is a model to test the influence of ESG on ESG without a moderation effect. The second model is a model to test the influence of ESG with a moderation effect.

Model 1 : $ICRit=\alpha+\beta1\cdot ESGit+\beta2\cdot CODit+\beta3\cdot ROAit+\beta4\cdot CRit+\mu i+\varepsilon it$

Model 2 : $ICRit=\alpha+\beta1\cdot ESGit+\beta2\cdot CODit+\beta3\cdot(ESGit\times CODit)+\beta4\cdot ROAit+\beta5\cdot CRit+\mu i+\varepsilon it.$

4. Results and Discussion

Descriptive Analysis

	ICR	ESG_	ENV_	SOC_	GOV_	COD	ROA_	CR_
Mean	48.97823	39.28354	22.91098	25.05292	69.77395	0.043944	0.059452	2.061466
Median	5.161106	39.00000	19.42000	25.42000	72.70000	0.032026	0.048200	1.580000
Maximum	2704.549	75.76000	80.40000	62.52000	98.62000	0.723141	0.557300	12.73000
Minimum	-48.77178	12.52000	0.000000	0.000000	34.92000	-0.080827	-0.696500	0.100000
Std. Dev.	217.9698	13.32770	20.38656	13.23369	12.18190	0.062906	0.098304	1.622872
Skewness	8.018195	0.171706	0.544242	0.062512	-0.411300	5.964341	-0.236597	2.268137
Kurtosis	76.58117	2.266171	2.191859	2.525015	2.739948	49.69116	14.44710	10.32418
Jarque-Bera	154780.7	17.91528	50.15905	6.583879	20.31317	63381.01	3582.307	2025.625
Probability	0.000000	0.000129	0.000000	0.037182	0.000039	0.000000	0.000000	0.000000
Sum	32080.74	25730.72	15006.69	16409.66	45701.94	28.78344	38.94120	1350.260
Sum Sq. Dev.	31072094	116168.5	271810.1	114535.3	97052.70	2.588009	6.320040	1722.448
Observations	655	655	655	655	655	655	655	655

Descriptive statistics are used to provide an overview of the characteristics of the data in this study. The variables analyzed include Interest Coverage Ratio (ICR) as a dependent variable, as well as independent and control variables, namely ESG Score, ESG dimensions (Environmental/ENV, Social/SOC, Governance/GOV), Cost of Debt (COD), Return on Assets (ROA), and Current Ratio (CR). The data consists of 655 company observations in the period 2014–2023.

ICR has an average score of 48.98 with a maximum score of 2,704.55 and a minimum of -48.77. However, the median value is only 5.16 which is far below average. This shows that the ICR data is very asymmetrical with a skewed distribution to the right (positive skewness of 8.02). The high kurtosis (76.58) and the probability value of the Jarque-Bera test of 0.0000 confirm that the distribution of ICR is very abnormal and contains many outliers. This condition reflects the existence of companies with very high interest rates, but most others are in the much lower range. This enormous variability is also reflected in the high standard deviation (217.97), indicating that financial stability between companies is very diverse.

The average ESG value is 39.28 with a very close median of 39.00. The range of values ranges from 12.52 to 75.76, indicating considerable variation in sustainability performance between companies. A skewness of 0.17 and a kurtosis of 2.26 indicate that the ESG distribution is close to normal. However, the significant probability value of the Jarque-Bera test ($p = 0.0001$) still shows that statistically, ESG data is not completely normally distributed. However, the distribution is relatively stable compared to other variables.

The average debt cost is 4.39%, but with a very tight distribution to the right (skewness = 5.96) and a very high kurtosis (49.69). There are companies that have a very high COD of up to 72.31%, while the minimum is even negative (-8.08%), which may reflect the recording of interest returns or a temporary mismatch between interest costs and liabilities. This

irregularity is reflected in the extreme Jarque-Bera value (p = 0.0000). This suggests that the COD data has significant outliers and is highly deviant from the normal distribution.

The Influence of ESG on Financial Distress

Model selection

Chow Test	Effects Test	Statistics	D.F.	Prob.
	Cross-section F	**13.915234**	**(71,579)**	**0.0000**
	Cross-section Chi-square	**652.120644**	**71**	**0.0000**
Housman Test	Test Summary	Chi-Sq. Statistics	Chi-Sq. D.F.	Prob.
		39.313499	**4**	**0.0000**

The first step in conducting panel data regression analysis is to determine the right panel data approach. The results of the model 1 and model 2 chow tests showed a P-value of 0.000 < 0.005, so the right regression approach is fixed effect. This result requires further testing, namely with the housman test. The results of Housman tests of models 1 and 2 show a P-value of 0.000 < 0.005, so the right regression approach is fixed effect. Panel data regression with fixed effect requires two classic assumptions that need to be fulfilled, first, namely the muliticolinearity test and the hesteroscysticity test.

Classic Assumption Test

Mulikolenieritas

	ESG_	**COD**	**ROA_**	**CR_**
ESG_	**1**	**0.03302681**	**0.07239491**	**-0.1299013**
COD	**0.03302681**	**1**	**0.09008456**	**-0.11177059**
ROA_	**0.07239491**	**0.09008456**	**1**	**0.23515465**
CR_	**-0.1299013**	**-0.11177059**	**0.23515465**	**1**

Based on the correlation matrix between the ESG variables, Cost of Debt (COD), Return on Assets (ROA), and Current Ratio (CR) that you have presented, no indication of serious multicollinearity was found. This is indicated by the relatively low correlation value between independent variables, where the entire value is below 0.3. In general, correlations below 0.8 are considered safe and do not raise concerns about multicollinearity in regression.

The correlation between ESG and COD was only 0.033; ESG with a ROA of 0.072; and ESG with a CR of -0.130. Similarly, the correlation between COD with ROA (0.090) and CR (-0.112), as well as ROA with CR (0.235), all showed a very weak relationship. These relationships are not strong enough to indicate a linear dependence between independent variables.

Hesteroschidasity
Glejser Tests

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	**14.23153**	**0.438639**	**32.44475**	**0.0000**
ESG	**-0.016742**	**0.006854**	**-2.442696**	**0.0149**
COD	**-1.208230**	**1.614189**	**-0.748506**	**0.4545**
ROA	**-6.621143**	**1.975964**	**-3.350841**	**0.0009**
CR	**-0.002616**	**0.155649**	**-0.016809**	**0.9866**

Hesteroscystidity testing is carried out with a glycer test. The results in models 1 and 2 show that the ESG variable has a coefficient of -0.0167 with a significance value of 0.0149, and a ROA of -6.6211 with a significance value of 0.0009. Both of these variables are significant, which indicates the presence of heteroscedasticity. These findings indicate heteroscedasticity, i.e. inconsistency of error variance between observations in the initial regression model. If these conditions are ignored and stick to the regular OLS model, then the standard error becomes inaccurate, which can lead to errors in statistical conclusions.

Therefore, the model used — EGLS (Cross-section weights) panels — is the right choice. This method accommodates heteroscedasticity between companies by giving different weight to each cross-section. Thus, the model becomes more robust, and the estimation results, including the t- and F tests, remain reliable. The selection of this model ensures that the main regression results are valid despite the heteroscedasticity issues in the panel data.

Hepotesis Test
Main Effects Testing

Model 1 : $ICRit=\alpha+\beta1\cdot ESGit+\beta2\cdot CODit+\beta3\cdot ROAit+\beta4\cdot CRit+\mu i+\varepsilon it$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	43.86059	1.603546	27.35225	0.0000
ESG	0.062565	0.034356	1.821089	0.0691
COD	-17.23336	6.121235	-2.815341	0.0050
ROA	49.09757	5.597887	8.770733	0.0000
CR	0.241688	0.486738	0.496547	0.6197

Moderation Effect Testing

Model 2 : $ICRit=\alpha+\beta1\cdot ESGit+\beta2\cdot CODit+\beta3\cdot(ESGit\times CODit)+ \beta4\cdot ROAit+\beta5\cdot CRit+\mu i+\varepsilon it$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	42.05815	1.826012	23.03279	0.0000
ESG	0.118981	0.041266	2.883293	0.0041
COD	22.71679	19.61820	1.157945	0.2474
ESG*COD	-0.971452	0.470705	-2.063822	0.0395
ROA	46.25984	5.431260	8.517331	0.0000
CR	0.097720	0.494469	0.197625	0.8434

5. Discussion

Cost of Debt (COD) has a significant negative influence on the ICR (coefficient -17.233; p-value 0.0050). This means that the more expensive the debt costs that the company bears, the lower its ability to cover the interest burden. Meanwhile, the ROA control variable has a very significant and positive effect on the ICR, showing that profitability is the main factor in increasing the company's capacity to meet interest obligations.

The CR control variable showed no significant influence on the ICR (p-value 0.6197), which indicates that a company's short-term liquidity is not a major determinant of interest payability in this model. This Model 1 has an Adjusted R-squared of 0.6817, which means that about 68% of the variation in ICR can be explained by the model, as well as a Prob(F-statistic) value of 0.0000, which indicates that the overall model is significant.

In model 2, the ESG interaction variable × COD (ESG_COD) was added to test whether the cost of debt strengthens or weakens the influence of ESG on ICR. The results of the analysis show that ESG is now statistically significant (coefficient 0.119; p-value 0.0041), suggesting that when considering the interaction with debt costs, the influence of ESG on ICR becomes clearer.

COD is no longer directly significant (p-value 0.2474), but its role remains important through its interaction with ESG. ESG_COD had a negative and significant influence on the ICR (coefficient -0.971; p-value 0.0395). This suggests that the positive influence of ESG on ICR will be reduced when companies have high debt costs. In other words, cost of debt acts as a variable that weakens the influence of ESG on a company's ability to pay interest. ROA remained significant and positive, while CR remained insignificant. The model also has an Adjusted R-squared of 0.6787, and a statistically significant F-value (Prob = 0.0000), indicating that the model still has good descriptive power.

Both model 1 and model 2 suggest that ESG has an effect in reducing the risk of companies experiencing financial distress. It can be seen that ESG has a significant positive effect on ICR both in model 1 with a P-value of 0.0691. and in model 2 with a P-value (0.0041). The higher the ESG value, the higher the ICR value. A high ICR value means that a company is healthier which reduces the risk of the company experiencing financial distress. This suggests that Hepotesa 1 is accepted.

The findings of this study are aligned with the Stakeholder Theory (Freeman, 2004), which posits that firms fulfilling stakeholder expectations across the environmental, social, and governance (ESG) dimensions are more likely to achieve sustainable performance. By meeting public expectations, companies enhance legitimacy and reputation, which supports long-term financial resilience.

Furthermore, the results support Signaling Theory (Connelly et al., 2011), as ESG disclosures signal risk management quality and organizational accountability to creditors and investors. This is particularly relevant in emerging markets like Indonesia, where ESG adoption remains in a developing phase. The study confirms that ESG is not merely symbolic but contributes substantially to mitigating financial distress.

The findings are consistent with recent empirical studies. Binesh et al. (2025) found that high ESG-performing U.S. firms experienced lower financial distress during the pandemic, identifying ESG as a shock absorber in crisis periods. Similarly, Zhou et al. (2025) showed that firms with higher ESG scores, coupled with transparent financial reporting and innovation (e.g., R&D, M&A), exhibited a stronger resilience against bankruptcy risks in Chinese capital markets.

Habib (2023) also demonstrated that firms combining cost leadership strategies with strong ESG performance are less prone to financial distress. ESG serves both as a mediating and protective mechanism that amplifies the effect of strategic cost management on firm stability.

Furthermore, to understand the role of cost of debt moderation on the relationship between ESG and financial distress, the results of ESG and cost of debt interaction can be seen. ESGxCOD coefficient = -0.9715 and P-value = 0.0395. This negative coefficient value indicates that the Cost of Debt moderates the influence of ESG on the ICR negatively. This means that the higher the company's debt costs, the weaker the positive influence of ESG on reducing financial distress. This reflects that high financial burdens can reduce the effectiveness of ESG practices in improving a company's financial condition. Therefore, this indicates that Hepotesa is two.

The role of cost of debt that empirically affects the relationship between ESG and financial distress explains several things. First, ESG practices are assumed to reduce the risk

of financial distress, as explained by stakeholder theory. However, the relationship is not absolute. Companies with high cost of debt have large interest expenses, which can weaken the positive effects of ESG on financial stability. Second, the cost of debt is a form of corporate financial burden. Even though the company has a good ESG score, its ability to reduce the risk of financial distress is still disrupted. where the higher the COD of eating, the more weakening the influence of ESG in reducing financial distress.

This result aligns with Westerfield & Jordan (2013), who emphasized that excessive debt burdens can constrain firms' ability to invest in sustainability. High borrowing costs not only increase bankruptcy risks but also limit the fiscal space required for ESG implementation. Studies by Shi et al. (2024) and Apergis et al. (2022) also confirm that firms with lower COD have greater flexibility to invest in ESG, while higher COD restricts such initiatives.

Under Signaling Theory, a high cost of debt reflects greater perceived risk and information asymmetry. Although ESG can reduce such asymmetry, its efficacy diminishes if firms lack sound capital structure. Interest expenses thus emerge as a structural constraint affecting the capacity of ESG to mitigate risk

The findings are further supported by Mariano et al. (2021) and Kalash (2023), who affirm that reliance on debt and high interest expenses increase financial vulnerability, especially in periods of external shocks such as currency crises. High leverage, in this regard, has a negative effect on financial performance, especially for financially distressed firms with limited retained earnings.

Managerial Implications

The results of this study provide several important implications for corporate decision-makers, especially at the managerial level. First, the findings show that companies with high ESG scores tend to have a better Interest Coverage Ratio (ICR), which means they have a lower risk of financial distress. Therefore, management needs to integrate ESG policies into operational and investment strategies as a preventive effort against long-term financial pressures.

Second, the role of moderation of the cost of debt shows that the high cost of debt can reduce the effectiveness of ESG in reducing the risk of financial distress. This confirms that even though the company has a good ESG performance, if its financing is dominated by high-cost debt, then the ESG benefits will not be optimal. Financial managers should actively review capital structures and consider funding cost efficiency.

The three dimensions of Governance in ESG have proven to be relevant to the perception of investor and creditor risk. Therefore, strengthening governance systems, disclosure transparency, and internal accountability will increase stakeholder trust and help companies access financing at a lower cost.

Fourth, risk management can not only be done through conventional financial approaches, but also through strengthening social and environmental aspects. Thus, the risk management unit must synergize with the sustainability team in developing the company's long-term strategy.

6. Conclusions

These results reinforce the theoretical assumption that ESG reduces financial distress risk through stronger stakeholder engagement and internal efficiencies. However, a high cost of debt reduces this protective effect, suggesting that financial structure is a critical enabler of ESG benefits.

Practically, companies should consider ESG not just for compliance or branding, but as a strategy to manage risk and optimize financing. Policymakers can leverage these insights by introducing ESG-tied loan incentives or ratings frameworks. Banks and investors should reward sustainable firms with favorable debt pricing.

Future research should explore sector-specific ESG impacts, adopt dynamic models, or investigate the role of sub-components such as environmental intensity or board governance quality.

Theoretically, the study contributes by bridging ESG strategy with financial distress frameworks through a moderation model. It introduces the role of cost of debt as a boundary condition affecting the ESG–distress link. Managerially, the results suggest that strong ESG commitment is not sufficient unless supported by efficient capital structure management.

Actionable recommendations include: (1) incorporating ESG metrics into corporate financial risk dashboards; (2) pursuing ESG-linked financing to lower debt costs; and (3)

improving governance disclosures and transparency to enhance stakeholder trust. Policymakers and financial institutions should also encourage ESG adoption by offering financing incentives and regulatory clarity.

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