

## The Effect of ESG Performance and Cost of Debt on the Credit Ratings of Companies Listed on the Indonesian Stock Exchange

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| Keywords                                                                                             | Abstract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ESG Performance; Cost of Debt; Credit Rating; Ordinal Logistic Regression; Indonesia Stock Exchange. | This study aimed to examine the effects of Environmental, Social, and Governance (ESG) performance and cost of debt on the credit ratings of cross-sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Using a purposive sampling method, a sample of 19 companies was selected, resulting in 57 panel data observations. The data were analyzed using ordinal logistic regression with a complementary log-log link function, incorporating leverage, firm size, and profitability (Return on Assets or ROA) as control variables. The empirical results showed that ESG performance and firm size had positive and significant effects on the probability of achieving higher credit ratings, providing theoretical support for the application of Signalling Theory and Legitimacy Theory. Conversely, cost of debt, leverage, and profitability did not have significant effects on credit ratings. These findings indicated that independent rating agencies consider sustainability transparency as an important signal for mitigating fundamental risks, whereas debt costs are perceived primarily as operational consequences that do not directly alter the hierarchy of creditworthiness assessments. |

### INTRODUCTION

The climate crisis represents a global challenge with systemic impacts on economic, social, and environmental sustainability. In Indonesia, the effects of climate change have become increasingly evident, with Bappenas (2023) estimating that economic losses caused by hydrometeorological disasters reach IDR 22.8 trillion annually. This phenomenon has encouraged stakeholders, particularly the corporate sector, to transition from conventional business models toward more responsible and sustainable practices. From the perspective of Stakeholder Theory, integrating environmental considerations into strategic management is no longer merely a complementary practice but a fundamental element that must be incorporated into core business activities to reduce long-term risks and maintain business sustainability (Hart, 2024).

In response to these challenges, the Environmental, Social, and Governance (ESG) framework has emerged as a standard for evaluating corporate sustainability performance. Through ESG disclosure, companies seek to demonstrate accountability in reducing carbon emissions, protecting employee rights, and implementing sound governance practices. In Indonesia, this urgency is reinforced by the Financial Services Authority regulation through POJK No. 51/POJK.03/2017, which requires sustainability reporting. However, ESG disclosure is not only intended to fulfill regulatory obligations but also serves as an important

instrument for investors and financial institutions in assessing corporate risk profiles and long-term credibility (Dye et al. 2021).

Although ESG transparency is considered essential for maintaining corporate credibility, empirical evidence regarding its impact on credit ratings remains inconsistent. On the one hand, research by Attig et al. (2013) and Goss (2011) demonstrated that strong ESG performance can provide positive signals that enhance creditor confidence and contribute to improved credit ratings. Conversely, other studies have identified a paradox in which excessive ESG investment may impose short-term financial burdens, resulting in an insignificant or even negative relationship with creditworthiness from the perspective of rating agencies that prioritize financial considerations (Cappucci, 2018).

Beyond sustainability aspects, cost of debt represents an important factor in determining corporate risk profiles. Cost of debt reflects the interest expenses associated with external financing and indicates market perceptions of a company's default risk (Brigham & Houston, 2019). Theoretically, companies with superior ESG performance are expected to experience lower systemic risks and benefit from more efficient debt costs. However, in practice, such cost efficiency is not always recognized as a determining factor for credit rating improvements by domestic rating agencies in developing countries such as Indonesia, where traditional financial indicators often remain dominant in credit assessments.

The inconsistent findings regarding the influence of ESG disclosure and cost of debt on credit ratings indicate the existence of a research gap. Furthermore, previous studies have predominantly employed conventional linear regression methods that assume symmetrical data distributions. However, credit ratings represent ordinal data that may not follow a normal distribution. Therefore, this study aimed to address this gap by examining the effects of ESG disclosure and cost of debt on credit ratings using Ordinal Logistic Regression with a Complementary Log-log link function, which provides a more appropriate approach for estimating the probability of rating changes within issuer data structures listed on the Indonesia Stock Exchange.

To provide a comprehensive analysis, this study also incorporated conventional financial control variables, including leverage, firm size, and profitability (Return on Assets or ROA), which are widely recognized as important indicators in credit assessments. Focusing on the 2022–2024 observation period, this study aimed to empirically examine whether sustainability-related signals and financial cost factors are materially considered by rating agencies in assessing corporate risk classifications in Indonesia. Based on this background, this study was titled “The Effect of ESG Performance and Cost of Debt on the Credit Ratings of Companies Listed on the Indonesia Stock Exchange.”

Credit rating is a key indicator reflecting a company's creditworthiness. Rating agencies, such as PEFINDO and Fitch Ratings Indonesia, evaluate ratings based on a company's ability to fulfill long-term financial obligations (S&P Global Ratings, 2019). A higher credit rating indicates a lower perceived default risk among investors and creditors. In the Indonesian capital market, credit ratings serve as an important reference for institutional investors and financial institutions in determining lending rates and financing costs. Credit ratings are influenced not only by financial factors, such as leverage, profitability, and liquidity, but also by non-financial factors, including corporate governance, information transparency, reputation, and sustainability performance reflected through ESG practices. As awareness of sustainability

risks increases, credit rating agencies have begun incorporating these non-financial factors into their evaluation processes (Kaur et al., 2023; Cioli et al., 2023). Therefore, examining factors influencing credit ratings is important to understand how sustainability considerations and financial risks are integrated into corporate risk assessments.

One factor considered to influence credit ratings is Environmental, Social, and Governance (ESG) performance. ESG reflects the extent to which companies consider environmental impacts, social responsibilities, and governance practices in their operations. Strong ESG implementation can enhance corporate transparency, strengthen reputation, and reduce long-term risks relevant to creditors (Eccles et al., 2014). Attig et al. (2013) found that companies with higher ESG scores tend to achieve better credit ratings because they are perceived as more stable and resilient against non-financial risks. However, other studies have reported different findings. Wang and Yang (2023) revealed that ESG implementation does not always significantly improve credit ratings, particularly in developing countries where sustainability considerations may not yet represent a primary factor for investors. These differences indicate that the relationship between ESG performance and credit ratings remains inconclusive and requires further investigation, particularly among Indonesian companies with varying market characteristics, ESG implementation levels, and regulatory environments.

In addition to ESG performance, cost of debt is another important factor influencing corporate credit ratings. Cost of debt represents the cost incurred by companies for obtaining financing from creditors and is generally measured through loan interest rates or debt returns paid by companies (Brigham & Houston, 2019). Companies with lower cost of debt are generally perceived as having lower default risk and stronger financial stability, increasing their likelihood of achieving higher credit ratings (El Ghouli et al., 2011). However, cost of debt is influenced not only by internal corporate characteristics but also by macroeconomic conditions, interest rates, inflation, and market perceptions of industry risks.

Within the sustainability context, several studies have shown that companies with stronger ESG performance tend to obtain lower debt costs because they are perceived as having better governance, higher transparency, and stronger risk management capabilities (Kanno, 2023; Houqe et al., 2020). Lower debt costs can ultimately strengthen financial positions and support improved creditworthiness. Nevertheless, empirical evidence regarding the relationship between ESG performance and credit ratings remains mixed. Some studies have identified significant positive relationships, while others have found weaker relationships depending on industry characteristics, market development levels, and ESG measurement methodologies. Therefore, further examination is required regarding the effects of ESG performance and cost of debt on credit ratings of companies listed on the Indonesia Stock Exchange (IDX), particularly amid increasing demands for sustainable finance implementation and corporate transparency.

Environmental, Social, and Governance (ESG) performance represents an important component in evaluating corporate sustainability and risk management. ESG reflects the extent to which companies demonstrate responsibility toward environmental protection, social obligations, and governance quality. Strong ESG performance has been found to positively influence credit ratings because it reflects lower default risk and higher investor confidence (Attig, El Ghouli, & Guedhami, 2013). Similarly, Stellner, Klein, and Zwergel (2015) found that ESG implementation strengthens creditor confidence and enhances corporate reputation.

However, contrasting findings indicate that only the governance dimension significantly influences credit ratings, while environmental and social dimensions do not demonstrate significant effects (Ding et al., 2023). This is consistent with findings from Sadiq et al. (2022), which suggest that ESG does not significantly influence credit ratings in developing countries because rating agencies continue to prioritize financial performance indicators. These inconsistencies highlight the need for further investigation into the relationship between ESG performance and credit ratings, particularly in developing countries such as Indonesia, where ESG awareness and disclosure practices remain uneven across industries.

Cost of debt represents the cost incurred by a company for financing obtained through loans or other forms of debt from creditors. It reflects the company's financial risk, as a higher cost of debt generally indicates greater risk perceived by creditors. Previous findings have shown that cost of debt has a negative and significant effect on credit ratings, where companies with lower debt costs tend to achieve better credit ratings because they are perceived as more financially stable (Ashbaugh-Skaife et al., 2006). However, other studies have reported different results, indicating that there is no significant relationship between cost of debt and credit ratings because rating assessments also incorporate non-financial factors, such as management strategies and governance practices (Mansi, Maxwell, & Miller, 2011). Furthermore, research has shown that the relationship between cost of debt and credit ratings may be influenced by ESG factors, as companies with poor ESG practices may experience higher debt costs despite having similar credit ratings (Goss & Roberts, 2011). These differences in findings indicate the existence of a research gap regarding how cost of debt and sustainability (Environmental, Social, and Governance or ESG) factors interact in influencing corporate credit ratings.

In addition to the main variables, research on credit ratings should also consider control variables, such as leverage, firm size, and profitability, as these factors significantly influence corporate risk and market confidence. Companies with higher leverage levels generally face greater default risks, potentially resulting in lower credit ratings (Oikonomou, Brooks, & Pavelin, 2014). Conversely, larger companies typically have easier access to financing and stronger reputations, which may increase their credibility in the assessment process conducted by rating agencies (Kouki, 2018). Higher profitability also strengthens a company's ability to fulfill financial obligations and reduce credit risk (Cheng & Subramanyam, 2008). In the context of cross-sector companies in Indonesia, these control variables are particularly important due to the capital-intensive characteristics of many industries and their sensitivity to fluctuations in global commodity prices. Therefore, a comprehensive analysis of the effects of ESG performance and cost of debt on credit ratings should incorporate these control variables to ensure more accurate and contextualized findings.

The urgency of this research is strengthened by increasing demands for corporate sustainability and the growing recognition of ESG factors in investment and credit decision-making processes. Following the implementation of POJK No. 51/POJK.03/2017, Indonesian companies are required to publish sustainability reports, making it important to examine whether such disclosures have a material impact on credit ratings. Furthermore, significant economic losses associated with climate-related disasters and Indonesia's growing potential for green investment further emphasize the relevance of this research. The novelty of this study lies in applying Ordinal Logistic Regression with a Complementary Log-log link function to

examine the effects of ESG performance and cost of debt on credit ratings within the Indonesian context. This methodological approach provides a more appropriate framework for estimating the probability of companies being classified into specific credit rating categories based on financial and non-financial characteristics. Additionally, this study contributes empirical evidence from a developing market perspective, complementing existing literature that has predominantly focused on developed economies.

This study aimed to re-examine the effects of Environmental, Social, and Governance (ESG) performance and cost of debt on the credit ratings of companies in Indonesia by incorporating control variables, including leverage, firm size, and profitability. Several previous studies have investigated the relationship between these factors and corporate credit ratings; however, the findings remain inconsistent. Some studies have demonstrated that ESG performance positively influences credit ratings because it enhances transparency and reduces non-financial risks (Attig et al., 2013; Stellner et al., 2015), whereas other studies have reported insignificant effects (Sadiq et al., 2022; Ding et al., 2023). Similarly, the influence of cost of debt on credit ratings has produced mixed results, with some studies identifying a significant negative relationship (Ashbaugh-Skaife et al., 2006), while others found no significant effect (Mansi et al., 2011). Given these inconsistencies, further investigation is needed using a broader and more representative empirical context, particularly among cross-sector companies listed on the Indonesia Stock Exchange (IDX). The Indonesian capital market is currently experiencing increasing sustainability requirements and diverse risk exposures across industries. Therefore, this study aimed to provide a more comprehensive understanding of how sustainability factors (ESG performance) and financial risk factors (cost of debt) influence corporate creditworthiness while controlling for key financial characteristics, including leverage, firm size, and profitability.

## **METHOD**

### **Research Design**

The research design served as a framework that guided the data collection, measurement, and analysis procedures to address the research objectives systematically (Sekaran & Bougie, 2013). This study employed a quantitative approach with a causal associative design. The quantitative approach was selected because the research involved numerical data analysis and statistical hypothesis testing. The causal associative design was used to examine the relationship and influence between independent and dependent variables.

This study examined the effects of the independent variables, namely Environmental, Social, and Governance (ESG) disclosure and cost of debt, on the dependent variable, namely corporate credit rating. The analysis also incorporated control variables, including leverage, firm size, and profitability (Return on Assets or ROA), to improve model accuracy. The observation period covered companies listed on the Indonesia Stock Exchange (IDX) that met the sample criteria during 2022–2024.

Through this research design, the study identified the direction and significance of relationships among variables using inferential statistical analysis, particularly the Ordinal Logistic Regression model. The results were expected to provide empirical evidence regarding the extent to which ESG disclosure, cost of debt, and financial characteristics influenced corporate credit rating classifications.

## POPULATION, SAMPLE SELECTION TECHNIQUES, AND SAMPLE SIZE

### Population and Sample Selection Techniques

The population in this study includes all companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. The selection of the population is based on the consideration that public companies have an obligation to communicate financial and non-financial information in a more transparent manner, thereby allowing for more accurate and consistent measurement of ESG performance and credit ratings.

The sampling technique used is *purposive sampling*, which is a method of determining samples based on certain criteria that are relevant to the research objectives. The sample selection criteria are as follows:

1. Companies that are consistently listed on the Indonesia Stock Exchange (IDX) consecutively during the observation period, namely 2022 to 2024.
2. Companies that have the availability of *complete (uninterrupted)* Environmental, Social, and Governance (ESG) Disclosure score data published by *the Bloomberg* terminal during the research period.
3. Companies that have a *credit rating history* that has been actively published by authoritative domestic rating agencies, especially PEFINDO, during the research period.
4. Companies that publish *audited annual reports* in full in Rupiah reporting currency, which contain data components for the calculation of *cost of debt, leverage, firm size, and profitability (Return on Assets)*.

The sample size that meets the above criteria will be used as a research analysis unit with an observation period of three years, resulting in panel data (*cross-section and time series*).

### 1. Data Collection Techniques

The data collection technique in this study uses secondary data sourced from various official publications. Secondary data was chosen because all variables studied can be accessed through credible public reports and databases and have been audited by independent parties. This approach is in accordance with the research objectives that focus on empirically testing the relationship between variables without directly intervening in the research object (Sugiyono, 2019).

### Research Model

In this study, the author used an ordinal logistic regression model (*Ordered Logit Regression*) with the *Complementary Log-Log (cloglog)* link function. This model is used because the dependent variable in the form of *Credit Rating* has a categorical nature (ordinal), so it does not meet the assumption of using linear regression. Ordinal logistic regression allows researchers to estimate the probability of a company being in a particular credit rating category based on the financial and non-financial characteristics of the company.

The selection of the *Complementary Log-Log link function* is based on the characteristics of the data distribution of asymmetrical dependent variables and the possibility of observation concentrations in certain ranking categories. According to Agresti (2010), the Complementary Log-Log link function is suitable for ordinal data when the cumulative probability is not distributed symmetrically as assumed in the logit model.

In mathematical equations, *Ordered Logit Regression* can be written as follows

$$\ln(-\ln(1 - P(Y \leq 1))) = \alpha_1 - (\beta_1 ESG + \beta_2 COD + \beta_3 Lev + \beta_4 Size + \beta_5 ROA$$

$$\ln(-\ln(1 - P(Y \leq 2))) = \alpha_2 - (\beta_1 ESG + \beta_2 COD + \beta_3 Lev + \beta_4 Size + \beta_5 ROA$$

$Y = \text{Credit Rating}$

$\alpha_1, \alpha_2 = \text{cut points (threshold) between credit rating categories}$

$\beta_1 - \beta_5 = \text{the regression coefficient of each independent variable}$

$ESG = \text{ESG Disclosure}$

$COD = \text{Cost of Debt}$

$LEV = \text{Leverage}$

$SIZE = \text{Firm Size}$

$ROA = \text{Return on Assets}$

$P(Y \leq j) = \text{the probability of the company being in the credit rating category of } j \text{ or lower}$

The selection of the ordinal logistic regression model in this study is based on the characteristics of the dependent variable, namely *Credit Rating*, which has the nature of stratified categorical data (ordinal). Credit ratings are grouped into three categories (Scores 1, 2, and 3) that have a clear hierarchical order, but the distance or interval between these categories is latent and cannot be assumed to be the same. Therefore, the use of this model is much more appropriate than regular linear regression to avoid biased estimates and violations of data-scale assumptions.

In the ordinal logistic regression analysis procedure, the number of equations produced is determined based on a formula where it is the sum of categories on the dependent variable. Given that this study uses three levels of credit rating categories, two threshold equations are mathematically formed  $K - 1$  as follows:

1. *Threshold 1 Equation* ( $\alpha_1$ ): Serves to measure the cumulative probability of a company being in the lowest category ( $\alpha_1$  *Lower Medium Grade*) compared to the higher rating category.
2. *Threshold 2 equation* ( $\alpha_2$ ): Serves to measure the cumulative probability of a company being in the range of the middle to lower category (*Lower and Upper Medium Grade*) compared to the highest rating category (*High Grade*).

Although this model produces two different intercept or *threshold* values, the regression coefficient values (*location* or) for  $\beta$  the *ESG Disclosure*, *Cost of Debt*, and other control variables remain consistent (a set of coefficients) for the entire equation. It is based on the assumption of *proportional odds*, where independent variables are considered to have an equal influence in driving the probability of a company moving from one category level to the category level above it.

In addition, the use of the Complementary Log-log (*Clog-log*) link function in the equation was chosen because of the distribution of research data that tends to be asymmetrical or skewed, where most of the observations are concentrated in higher ranking categories. The Clog-log function mathematically provides a more stable and objective estimation accuracy than the standard *logit* function in dealing with such unbalanced data structures (Agresti, 2018).

## RESULTS AND DISCUSSION

### Results Of The Data Analysis Assumption Test

The estimation of ordinal logistic regression parameters in this study is rooted in the non-linear criterion of Maximum Likelihood Estimation (MLE) and not based on Ordinary Least Squares (OLS). Referring to the theoretical constraints of econometrics by Gujarati and Porter (2009) and Hosmer and Lemeshow (2013), MLE-based modeling is automatically exempt from the fulfillment of the classical assumption test of normal distribution rigidity at residual and homogeneous variance (heteroscedasticity). The conceptual foundation of these experts confirms that the abandonment of the two classical tests will not harm the validity of the alleged value of the logistic regression coefficient. Therefore, the assumption testing in this study is focused on multicollinearity and autocorrelation testing as part of the model quality evaluation.

### Multicollinearity Test Results

Multicollinearity test results based on metrics Tolerance and Variance Inflation Factor (VIF) is shown in the following Table 1:

**Table 1.** Multicollinearity Test Results

| Variabel   | Unstandardized Coefficients (B) | Unstandardized Coefficients (Std. Error) | Standardized Coefficients (Beta) | T      | Sig.  | Collinearity Statistics (Tolerance) | Collinearity Statistics (VIF) |
|------------|---------------------------------|------------------------------------------|----------------------------------|--------|-------|-------------------------------------|-------------------------------|
| (Constant) | 4.803                           | 0.635                                    |                                  | 7.565  | <,001 |                                     |                               |
| ESG        | -0.026                          | 0.008                                    | -0.408                           | -3.157 | 0.003 | 0.775                               | 1.29                          |
| COD        | 0.577                           | 0.962                                    | 0.074                            | 0.6    | 0.551 | 0.856                               | 1.168                         |
| lev        | -0.004                          | 0.12                                     | -0.005                           | -0.037 | 0.971 | 0.839                               | 1.192                         |
| firmsize   | -0.07                           | 0.016                                    | -0.511                           | -4.265 | <,001 | 0.903                               | 1.108                         |
| prof_roa   | -0.119                          | 1.812                                    | -0.009                           | -0.066 | 0.948 | 0.641                               | 1.561                         |

## Results Of Data Analysis

The main substance of this panel data analysis is directed at testing the empirical truth of the research hypotheses that have been constructed. In accordance with the nature of statistical correctness which is probabilistic and contains an element of residual error (*error term*), the interpretation of the test is avoided from the use of the absolute word "proven", but is elaborated through the degree of tendency to accept or reject the hypothesis statistically in the first place.

### Evaluation of Model Feasibility (*Goodness of Fit*)

The assessment of empirical model alignment is measured using *Model Fitting Information (Likelihood Ratio Test)* for simultaneous testing, as well as the Pearson and Deviance criteria for measuring the fit of empirical data, as described in Tables 2 and 3:

**Table 2.** Test Results *Model Fitting Information*

| Model          | -2 Log Likelihood | Chi-Square | df | Say.   |
|----------------|-------------------|------------|----|--------|
| Intercept Only | 107.465           |            |    |        |
| Final          | 84.608            | 22.857     | 5  | <.0.01 |

*Model Fitting Information* Showing statistical testing Likelihood Ratio Test comparing improvement in scores -2 Log Likelihood from the model without predictors (107,465) to the final model (84,608), resulting in a value *Chi-Square* of 22,857 with a significance level of <0.001. Since the probability value was well below the 5% error level (<0.001 < 0.05), it was concluded that simultaneously the combination of all independent and control variables affected the probability of determining the corporate credit rating cluster.

**Table 3.** Test Results *Goodness of Fit*

|          | Chi-Square | df  | Say.  |
|----------|------------|-----|-------|
| Pearson  | 114.68     | 107 | 0.288 |
| Deviance | 84.608     | 107 | 0.946 |

The model feasibility test (*Goodness of Fit*) through the *Pearson* indicator recorded a significance value of 0.288, while the *Deviance test* produced a significance number of 0.946. Referring to Agresti's (2010) guideline, a model is considered aligned if its probability value is above the error tolerance limit of 5% (Sig. > 0.05). Since the values of these two parameters far exceed the number of 0.05, it can be concluded unequivocally that the ordinal logistic regression model formed is in accordance with the empirical data. The main conclusion is that there is no real difference between the predicted results of the model and the frequency of actual observation data in the field, so this model is declared valid and feasible to test the hypothesis.

### 1. Uji Paralelisme (*Test of Parallel Lines*)

The parallelism test is an absolute prerequisite test (*proportional odds assumption*) that tests the feasibility of using ordinal regression. This test evaluates whether the slope coefficient is equal and constant at each level of the accumulated threshold of dependent variables. The parallelism test parameters are summarized in Table 4:

**Table 4.** Test Results of Test of Parallel Lines

| Model           | -2Log Likelihood | Chi-Square ( $\chi^2$ ) | df | Sig.  | Assumption            | Conclusion |
|-----------------|------------------|-------------------------|----|-------|-----------------------|------------|
| Null Hypothesis | 84,608           |                         |    |       |                       |            |
| General         | 75,343           | 9,265                   | 5  | 0.099 | Assumptions Fulfilled |            |

Referring to the theoretical provisions of Long and Freese (2014), the assumption of proportionality is stated to be fulfilled if the value of statistical significance is greater than the error level of 0.05 (Sig. > 0.05). The computational results in Table 4.5 produce a *Chi-Square* value of 9.265 with a significance value (*p-value*) of 0.099. Because  $0.099 > 0.05$ , the model fails to reject the null hypothesis, which means the coefficient slope line proves to be parallel and equal for the entire class-level equation.

## 2. Koefisien Determinasi (*Pseudo R-Square*)

The explanatory power of independent variables is measured through *Pseudo R-Square* estimation modeling with a primary focus on the *Nagelkerke* formula, which is summarized in Table 5:

**Table 5.** Results of Exploration of Pseudo R-Square Determination Coefficient

| Pseudo R-Square Measurement Type | Statistical Value |
|----------------------------------|-------------------|
| Cox and Snell                    | 0.330             |
| Nagelkerke                       | 0.389             |
| McFadden                         | 0.213             |

Table 5 presents the value of the *Nagelkerke R-Square* coefficient of 0.389. These mathematical results provide an indication of the meaning that the cumulative probability variability of the issuer's *credit rating* eligibility level can be explained together by 38.9% by the movement of ESG scores, *Cost of Debt*, and the three components of financial control. The remaining percentage of 61.1% is influenced by the dynamics of macroeconomic indicators or other external indicators of corporations beyond the reach of this empirical model.

## 3. Estimasi Parameter (*Parameter Estimates*)

Proving the direction of the relationship and the level of significance of each hypothesis was evaluated using the Wald Test (z-statistic) at a degree of 95% confidence ( $\alpha = 0.05$ ). The results of the summary parameter estimates are shown in Table 4.10:

**Table 6.** Parameter Coefficient Estimation Results

|           |                    | Coefficients<br>(Estimate) | Std.<br>Error | Forest | df | Sig.   | Hypothesis<br>Conclusion |
|-----------|--------------------|----------------------------|---------------|--------|----|--------|--------------------------|
| Threshold | [kategori_kelas=1] | 5,933                      | 1,920         | 9,545  | 1  | 0.002  | Threshold<br>Formed      |
|           | [kategori_kelas=2] | 8,591                      | 2,101         | 16,721 | 1  | <0.001 | Threshold<br>Formed      |
| Location  | ESG Disclosure     | 67                         | 23            | 8,428  | 1  | 0.004  | Hypothesis<br>Accepted   |

|                               | Coefficients<br>(Estimate) | Std.<br>Error | Forest | df | Say.   | Hypothesis<br>Conclusion |   |
|-------------------------------|----------------------------|---------------|--------|----|--------|--------------------------|---|
| Cost of Debt                  | -2,488                     | 2,207         | 1,270  | 1  | 0.260  | Hypothesis<br>Ditolak    | 2 |
| Leverage                      | 38                         | 331           | 14     | 1  | 0.907  | Insignificant            |   |
| Firm Size                     | 195                        | 50            | 14,958 | 1  | <0.001 | Significant<br>Positive  |   |
| Return on Assets<br>(Kontrol) | 6,627                      | 4,626         | 2,052  | 1  | 0.152  | Insignificant            |   |

The extraction of the parameters in Table 6 results in a formal mathematical formulation for the *Polytomous Universal Model* (PLUM) model with the *Complementary Log-log* link function as follows:

Threshold Equation 1 (Category 1 Limit):

$$\ln(-\ln(1 - P(Y \leq 1))) = 5,933 - (0,067ESG_{it} - 2,488COD_{it} + 0,038LEV_{it} + 0,195SIZE_{it} + 6,627ROA_{it})$$

Threshold Equation 2 (Category 2 Limit):

$$\ln(-\ln(1 - P(Y \leq 2))) = 8,591 - (0,067ESG_{it} - 2,488COD_{it} + 0,038LEV_{it} + 0,195SIZE_{it} + 6,627ROA_{it})$$

The First Hypothesis (H1) test was carried out by examining the significance numbers in the *ESG Disclosure variable* row. The results of statistical processing showed an Estimate coefficient value of 0.067 with a *Wald Test* of 8.428 and a significance level (*p-value*) of 0.004. Referring to the decision-making criterion = 0.05, the significance value that is below the threshold of error ( $0.004 < 0.05$ ) provides a statistical conclusion that the First Hypothesis (H1) is accepted, indicating a significant positive association tendency. $\alpha$

The Second Hypothesis (H2) test was carried out by examining the significance numbers on the *Cost of Debt variable* row. The approximate value configuration shows an Estimate coefficient of -2.488 with a *Wald* value of 1.270 and a significance level of 0.260. Since the probability number was proven to exceed the required error tolerance limit ( $0.260 > 0.05$ ), it was statistically decided that the Second Hypothesis (H2) was rejected, confirming the absence of any real influence.

### The Effect of ESG Disclosure on Credit Rating

The results of the statistical estimation in Table 4.10 show a positive coefficient direction value of 0.067 in the *ESG Disclosure* variable with a significance value of 0.004. The meeting of this conceptual positive direction shows full alignment in the four components of analysis, namely the building of the foundation theory, the empirical map of previous research, the direction of the initial hypothesis formulation, and the results of statistical data processing. The conclusion of this test provides the meaning that the improvement in the quality of disclosure of corporate sustainability instruments is positively correlated with the probability of increasing the creditworthiness class of issuers in Indonesia.

These findings are in line with previous studies that have found that the quality of ESG disclosures contributes positively to improving a company's credit rating. Attig et al. (2013) prove that companies with better social responsibility performance tend to obtain higher credit ratings because they are considered to have a lower risk of default. Similar results were also found by Eliwa et al. (2021) and Sadiq et al. (2022), which show that ESG transparency is able

to reduce information asymmetry and increase investor and creditors' confidence in the company's sustainability prospects. Thus, the results of this study reinforce the empirical evidence that ESG information has become one of the non-financial factors considered in the modern credit rating process.

These results provide empirical support for the validity of the Signalling Theory which places the publication of ESG reports as a high-quality non-financial signaling instrument. In the midst of the asymmetric conditions of capital market information, transparent ESG disclosures send positive signals to analysts of independent rating agencies such as PEFINDO. The sustainability signal emphasizes that proactive management mitigates environmental risks and long-term social risks, thereby lowering expectations of future business failure risks. In line with Stakeholder Theory and Legitimacy Theory, this green compliance builds strong social legitimacy, keeping issuers away from the risk of OJK jurisdictional fines or market boycotts that can disrupt the stability of the company's operating cash flow. This positive correlation corroborates the results of studies from Attig, El Ghouli, and Guedhami (2013) and Sadiq (2022) which prove that strengthening ESG governance aspects is universally recognized by global rating agencies as an indicator of reducing corporate fundamental risk.

#### **The Effect of Cost of Debt on Credit Rating**

The test results for the *Cost of Debt* variable produced a negative coefficient of -2.488 with an inflated significance level of 0.260. The insignificance of these results confirms the disconnection of the directional signs in the analysis component, where the theoretical negative direction is not statistically proven to be statistically real in a sample of issuers in Indonesia. The test conclusions show that the annual real interest expense paid by corporations does not act as a major determinant driving the determination of credit rating strata.

The results of this study are consistent with several previous studies that have found that the cost of debt is not always a significant factor in explaining variations in a company's credit rating. Purnamasari et al. (2023) show that the rating agency's assessment focuses more on the company's ability to meet long-term obligations than on the interest rate paid by the company. Similar findings were also conveyed by De Oliveira and Basso (2024), who explained that liquidity indicators, cash flow capacity, and leverage levels have a more dominant role in the credit risk evaluation process than historical funding costs. Therefore, Cost of Debt tends to be viewed as a consequence of a company's credit quality rather than as a major factor determining changes in credit ratings.

This statistical fact indicates that in the process of assessing the risk of corporate default, independent rating agencies do not focus on the evaluation of historical interest rate fluctuations on current real loans. In line with the latest analytical conceptual framework from De Oliveira and Basso (2024) and Vipond (2022), the creditworthiness testing methodology prioritizes the assessment of the absolute capacity to fulfill the company's long-term obligations that are predictive (*forward-looking liquidity*), such as the availability of liquid cash, the capital adequacy ratio, and the debt-to-gross profit capacity ratio (*Debt to EBITDA*). In the domestic market, the nominal cost of debt is often distorted due to shifts in the central bank's benchmark interest rate policy (BI-Rate) or the presence of physical asset guarantees guaranteed by companies. Especially for issuers that have affiliates of large conglomerate groups or state-owned enterprises that receive implicit state guarantees (*sovereign support*), the rating agency will still maintain a high *Investment Grade* position (Purnamasari et al., 2023), making the

nominal cost of debt positioned solely as a consequence of past ratings and not the main trigger for changes in credit rating classes.

### **Contribution of Control Variables**

The inclusion of three control variables into the regression model provides the following contextual findings:

1. **Leverage variable (lev):** Scored a minor positive coefficient of 0.038 with a significance value of 0.907. This probability far exceeding the alpha limit of 5% suggests that the ratio of debt to total assets does not have a significant influence on the determination of credit ratings, as long as the company is able to utilize the debt for productive activities that generate consistent cash flow.
2. **Firm Size variable (firmsize):** Shows a positive coefficient of 0.195 with a very strong significance value ( $<0.001$ ). These statistical results fully support the theoretical assumption of *the Resource-Based View* (RBV), which states that large-scale companies have a competitive advantage in the form of massive asset base control and broad access to emergency funding. Rating agencies assess that large size scales provide high structural resilience (*too big to fail*) when facing economic shocks.
3. **Return on Assets (prof\_roa):** Obtained a positive coefficient of 6.627 with a significance level of 0.152. Since the probability number is above 0.05, it is concluded that annual profitability does not have a statistically significant effect on boosting credit ratings in this sample. This reflects the rationality of rating agencies that prioritize long-term liquidity stability over annual net profit fluctuations that are vulnerable to the intervention of the company's internal accounting policies.

The results of the control variable test showed that only the Firm Size had a significant influence on the Credit Rating. These findings are in line with research by Bhojraj and Sengupta (2003), Alp (2013), and Purnamasari et al. (2023) which found that companies with larger asset sizes tend to obtain higher credit ratings because they have stronger funding capacity, broader business diversification, and better resilience to economic pressures. In contrast, the Leverage and Return on Assets (ROA) variables did not show a significant influence, indicating that rating agencies do not only consider the level of debt or momentary profitability, but rather emphasize the company's ability to maintain financial stability and meet its long-term obligations.

### **CONCLUSION**

The conclusion of this study was not merely a summary of statistical results but a synthesis of the empirical findings, theoretical foundations, and hypothesis testing outcomes. Based on the panel data analysis and comprehensive discussion presented in Chapter IV, this study formulated two main conclusions that directly addressed the research hypotheses.

First, Environmental, Social, and Governance (ESG) transparency performance had a positive influence on corporate credit ratings in Indonesia. This finding supports the relevance of Signalling Theory and Legitimacy Theory in modern capital markets, where commitment to sustainability and governance transparency functions as a significant non-financial signal. Rating agencies consider ESG compliance as an indication that management actively mitigates regulatory risks, legal risks, and social pressures. Comprehensive ESG disclosure can reduce

information asymmetry, strengthen creditor confidence, and increase the likelihood of companies achieving higher credit rating categories.

Second, cost of debt did not contribute significantly to predicting or explaining changes in corporate credit rating classifications. The rejection of this hypothesis provides empirical evidence that the level of interest costs paid by companies is not the primary determinant considered by credit rating agencies in Indonesia. Instead, rating agencies tend to emphasize a company's fundamental ability to meet financial obligations through forward-looking indicators, such as free cash flow stability and the Interest Coverage Ratio (ICR). Furthermore, corporate interest rates in the domestic market may be influenced by external factors, including BI-Rate fluctuations and sovereign support mechanisms, which may reduce the direct relationship between cost of debt and credit rating assessments.

## REFERENCES

- Agresti, A. (2018). *An introduction to categorical data analysis* (3rd ed.). John Wiley & Sons.
- Alp, A. (2013). Structural shifts in credit rating standards. *The Journal of Finance*, 68(6), 2435–2470.
- Ashbaugh-Skaife, H., Collins, D. W., & LaFond, R. (2006). The effects of corporate governance on credit ratings. *Journal of Accounting and Economics*, 42(1–2), 203–243.
- Attig, N., El Ghouli, S., & Guedhami, O. (2013). Corporate social responsibility and credit ratings. *Journal of Business Ethics*, 117(4), 679–694.
- Badan Perencanaan Pembangunan Nasional. (2023). *Laporan pelaksanaan pencapaian tujuan pembangunan berkelanjutan (TPB/SDGs) di Indonesia*. Kementerian PPN/Bappenas.
- Bhojraj, S., & Sengupta, P. (2003). Effect of corporate governance on bond ratings and yields: The role of institutional investors and outside directors. *The Journal of Business*, 76(3), 455–475.
- Brigham, E. F., & Ehrhardt, M. C. (2016). *Financial management: Theory and practice* (15th ed.). Cengage Learning.
- Cappucci, M. (2018). The ESG integration paradox. *Journal of Applied Corporate Finance*, 30(2), 22–28.
- Chen, S. L., Wang, D. N., & Chen, H. W. (2025). The impact of ESG factors on credit ratings: An empirical study of European banks. *International Review of Economics & Finance*, 99, 104056.
- Cheng, M., & Subramanyam, K. R. (2008). Analyst following and credit ratings. *Contemporary Accounting Research*, 25(4), 1007–1044.
- Cioli, V., Giannozzi, A., Pescatori, L., & Roggi, O. (2023). Are environmental, social and governance factors incorporated in the credit ratings? *Risk Governance and Control: Financial Markets & Institutions*, 13(3), 22–32.
- De Oliveira, N. A., & Basso, L. F. (2024). The impact of value creation (Tobin's Q), total shareholder return (TSR), and survival (Altman's Z) on credit ratings. *International Journal of Financial Studies*, 12(2), 44.
- Ding, L. (2023). The differential impact of ESG dimensions on credit ratings. *Finance Research Letters*, 52.
- Dye, J., McKinnon, M., & Van der Byl, C. (2021). Green gaps: Firm ESG disclosure and financial institutions' reporting requirements. *Journal of Sustainability Research*, 3(1).
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science*, 60(11), 2835–2857.
- El Ghouli, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, 35(9), 2388–

- Eliwa, Y., Aboud, A., & Saleh, A. (2021). ESG practices and the cost of debt: Evidence from EU countries. *Critical Perspectives on Accounting*, 79, 102097.
- Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill Education.
- Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, 20(4), 986–1014.
- Hart, S. L. (2024). *Beyond shareholder primacy: Remaking capitalism for a sustainable future*. Stanford Business Books.
- Hosmer, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression* (3rd ed.). John Wiley & Sons.
- Houqe, M. N., Ahmed, K., & Richardson, G. (2020). The effect of environmental, social, and governance performance factors on firms' cost of debt: International evidence. *The International Journal of Accounting*, 55(3).
- Kanno, Y. (2023). The effect of ESG on the cost of debt in the Japanese market. *International Review of Financial Analysis*, 88.
- Kaur, J., Vij, M., & C. A. (2023). Signals influencing corporate credit ratings—A systematic literature review. *DECISION*, 50(1), 7–31.
- Kouki, M. (2018). Credit rating and debt structure: Evidence from Tunisia. *Journal of Accounting in Emerging Economies*, 8(3), 329–346.
- Mansi, S. A., Maxwell, W. F., & Miller, D. P. (2011). Analyst forecast characteristics and the cost of debt. *Review of Accounting Studies*, 16(1), 116–142.
- Oikonomou, I., Brooks, C., & Pavelin, S. (2014). The effects of corporate social performance on the cost of corporate debt and credit ratings. *The Financial Review*, 49(1), 49–75.
- Oliveira, L., & Basso, L. (2024). Capital structure and credit rating: An analysis of Latin American firms. *Emerging Markets Review*, 58.
- Purnamasari, D. I. (2023). Cost of debt dan credit rating di Indonesia. *Jurnal Akuntansi dan Keuangan / Research in Management and Accounting*, X(X).
- Sadiq, M., et al. (2022). ESG performance and credit rating: Evidence from emerging markets. *Economic Analysis and Policy*, 74, 531–545.
- Sekaran, U., & Bougie, R. (2013). *Research methods for business: A skill-building approach* (6th ed.). John Wiley & Sons.
- Stellner, C., Klein, C., & Zwergel, B. (2015). Corporate social responsibility and Eurozone corporate bonds: The moderating role of country sustainability. *Journal of Banking & Finance*, 59, 538–549.
- Sugiyono. (2019). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.
- Vipond, A. (2022). The relevance of credit ratings in determining risk premium and cost of capital. *Journal of Financial Regulation and Compliance*, 30(4), 125–140.
- Wang, X., & Yang, Y. (2023). ESG performance and credit ratings: Evidence from China. *Pacific-Basin Finance Journal*, 78.