



## The Role of ESG Component in Shaping Corporate Cost of Debt and Cost of Equity in Indonesia

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**Abstract:** This study aims to analyze how the ESG combined score and its components affect the cost of debt and equity for listed companies in Indonesia. Otoritas Jasa Keuangan (OJK) has issued regulations to encourage the inclusion of companies' ESG performance in investment decisions. This has resulted in companies getting incentives to improve their ESG performance. However, the actual impact of lower capital costs due to improved ESG performance is still unavailable in Indonesia. This study attempts to fill this gap by considering the impact of the assessment of the components that underlie ESG values: emission reduction, resource use, environmental innovation, workforce, community, human rights, product responsibility, CSR strategy, management, and shareholder rights on the cost of debt and equity. The results show the ESG combined score has no impact on the cost of debt. However, components such as emissions, environmental innovation, and human rights can directly affect the company's debt cost. In addition, the results show that the combined ESG score and almost all components that build the ESG score affect the company's equity cost. However, this study found that the majority had a positive relationship with heavy-polluting companies and a negative relationship with non-heavy-polluting companies.

**Keywords:** ESG, Cost of Debt, Cost of Equity, Sustainable Finance, Indonesian Companies

### INTRODUCTION

The role of the Indonesian government in addressing global warming issues has made the application of sustainability to business activities an important topic and has gained attention from a diverse range of industries and investors (Apergis et al., 2022; Asimakopoulos et al., 2023). The increasing number and value of green bonds on the Indonesia Stock Exchange (IDX) in 2023 provide evidence of this trend. In 2023, the value of green bonds in IDX increased by 28.8% compared with 2022. In addition, there is an increase in investors' interest related to sustainability and responsible investing (SRI), as evidenced by the growing interest in the SRI-Kehati index (Yayasan KEHATI, 2023). The SRI-Kehati index includes 25 companies that implement the principles of Sustainable, Responsible, Investment and Environmental, Social, and Governance (ESG). The increase in the SRI-Kehati index and green bond issuance indicate some investors and several industries already consider the importance

of implementing sustainability to improve the quality of their products or services in business activities (Koczar et al., 2023; Leonard et al., 2022).

Based on PWC Indonesia - ESG Team (2023), increased awareness of ESG integration driven by government regulations can lead to higher risk perceptions for industries that have a large contribution to carbon emissions in Indonesia, such as the energy and basic materials sectors. These industries face challenges in aligning their business activities with the Indonesian government's targets in fulfilling the Paris Agreement, which can ultimately lead to increased debt and equity costs. This is proven by one of Indonesia's biggest mining corporations, which indicated that there were challenges to completing its project due to greater financing costs than typical because it was perceived to be unconcerned with ESG issues; they have high-risk ESG scores. However, this may not be limited to the energy and basic material sectors. Some companies in other industries may face similar consequences if they get low ESG performance when ESG standards have been effective in Indonesia. Although the Indonesian government has issued regulations such as incentives for ESG integration and Green Bonds, no studies have been conducted to demonstrate how much this regulation affects debtholders' and investors' considerations in making investment decisions.

Therefore, the gap between the policies of the Indonesian government, the expectations of investors and debtholders regarding ESG, and the ability of companies to determine strategies for integrating ESG can cause problems. Therefore, research is needed on how regulations in Indonesia regarding ESG have influenced the expectations of investors and debtholders, ultimately impacting the company's debt and equity costs. This study aims to answer this gap by analyzing the impact of each component that builds the ESG score on the company's debt and equity cost. In addition, this study also provides recommendations and insight for companies in Indonesia to prioritize their resources on ESG areas that have the most significant impact on reducing the cost of debt and cost of equity while aligning with national sustainability goals.

Previously, sustainability activities such as environmental protection were considered costs that caused a reduction in cash performance and a burden for the company. ESG spending was considered to hinder the company's development because it had used up resources for research and development. This is shown by several literatures, such as Becchetti & Ciciretti (2009), Duque-Grisales & Aguilera-Caracuel, (2019), and Smith et al. (2007), which found that ESG performance had a negative impact on financial performance (Chen et al., 2023). However, the implementation of ESG initiatives in companies has been widely accepted. Several studies have found that the ESG performance of companies in several countries seen in the form of scoring or risk rating has a negative impact on the cost of debt, cost of equity, and weighted average cost of capital (WACC), and a few studies have shown an insignificant relationship between ESG performance of companies and cost of debt.

Several theories have been developed to underline the relationship between a company's ESG performance and the cost of debt and equity. Based on the Stakeholder theory developed by Freeman (1999), we need to consider the interests of all parties that influence or are influenced by the company's goals, including stockholders, management, suppliers, customers, debt holders, and government, to achieve efficiency in business activities. Meanwhile, legitimacy theory implicitly encourages corporate decisions to prioritize social values and community norms to prevent social consequences that will directly impact business activities (C. Deegan et al., 2002; C. Deegan, 2019). In addition, implementing ESG initiatives may enable companies to address the potential issues that may arise under the Agency theory (Shapiro, 2005), where the company and several related stakeholders may have a conflict of interest that will ultimately result in losses for the company or stakeholders.

In order to reach Indonesia's goal of net-zero emissions, there are currently a number of areas that the general public is concerned about. These industries are covered in Indonesia's

NDC document, particularly the energy, basic materials, and transportation industries, which have the highest carbon emissions. Consequently, the public often expects these industries to enhance their efforts to assist Indonesia in achieving its objectives. The sector will respond more rapidly and may increase the cost of capital due to higher risk if its ESG score is weak. This is consistent with the legitimacy theory (C. Deegan et al., 2002), which holds that business activities must consider what the public expects of them in order to be legitimate. Building upon the existing study and the theories above, this research suggests that the improvement of the company's ESG score can reduce its cost of capital, including all the components (emission reduction, resource use, environmental innovation, community, workforce, human rights, product responsibility, CSR strategy, management, and shareholders score) that build the ESG score. Because the higher each component is, the more the ESG score will increase. Therefore, this research hypothesizes that there is a negative relationship between the company's ESG score (emission reduction, resource use, environmental innovation, community, workforce, human rights, product responsibility, CSR strategy, management, shareholders) and the cost of capital, with a significant effect in non-heavily pollutant industries compared to heavily pollutant industries.

## METHOD

Three types of variables are employed in this study: independent (emission reduction, resource use, environmental innovation, community engagement, worker considerations, human rights, product accountability, corporate social responsibility strategy, management efficacy, and shareholder performance score), dependent (cost of debt and cost of equity), and control variables (book-to-market ratio, leverage, interest coverage ratio, return on asset, liquidity ratio, firm-size). This study will employ these three factors using regression analysis, considering literature review and using heavy-polluting industry for mediating variable. The data obtained in this research is from secondary data with reliable reference. The following are secondary data used for the research: reports issued by relevant companies, market data (reliable news, stock exchange, and market trends), and the main data for this research is data from Refinitiv, especially for the ESG score and the financial metrics

Based on existing research, panel data regression and multiple linear regression are methods that are often used, especially to see how ESG performance impacts the company's financial metrics. (Lavin & Montecinos-Pearce, 2022; Shi et al., 2024). Panel data regression has several advantages in financial research, including its ability to illustrate trends over time and manage variability across various corporate structures. Moreover, panel data regression helps reduce bias that may arise from the combinations of individual-year data (Gujarati et al., 2003). Therefore, this study is more appropriate for using the panel data regression method. Furthermore, Stata 14 was employed to analyze the acquired data for this research.

Panel data regression is divided into two, namely: fixed-effect model (FEM) and random-effect model (REM) (Gujarati et al., 2003). Based on previous research, the relationship between ESG and cost of capital can be influenced by company characteristics such as company size, financial performance, and the industrial sector. Therefore, the fixed-effect method is more appropriate for use in this study. However, to ensure the use of a more appropriate method based on the available data, a Hausman test was carried out. The following is a basic model regression with the FEM and REM methods that will be used to test the hypothesis :

### a. Fixed-Effect Model

$$C_{it} = \alpha_i + \beta_1 \text{Score}_{i,t} + \beta_2 (\text{Score}_{i,t} \times \text{PollutInd}_i) + \sum_{j=3}^0 \beta_j \text{CV}_{j,i,t} + \varepsilon_{it}$$

**b. Random-Effect Model**

$$C_{it} = \beta_0 + \beta_1 Score_{i,t} + \beta_2 (Score_{i,t} \times PollutInd_i) + \sum_{j=3}^o \beta_j CV_{j,i,t} + \mu_{it}$$

Where :

$C_{it}$ , dependent variable (cost of debt and cost of equity) for the company i at time t

$\alpha_i$ , intercept for company i (fixed-effect company)

$\beta_0$ , the general intercept for all company

$\beta_1$ , the coefficient for the impact of the score on the dependent variable (non-heavy-polluting industry)

$\beta_2$ , the coefficient for the impact of the score on the dependent variable (heavy-polluting industry)

$Score_{i,t}$ , independent variable (ESG, emission reduction, resource use, environmental innovation, community, workforce, human rights, product responsibility, CSR strategy, management, shareholders score)

$Score_{i,t} \times PollutInd_i$ , interaction between scores and companies included in the heavy-polluting industry sector

$\sum_{j=3}^o \beta_j CV_{j,i,t}$ , control variable j-o for the company i at time t

$\epsilon_{it}$ , error term for the regression model

$\mu_{it}$ , combined error term from random-effect for the company i and another error term

Before analyze this regression model, the study using multicollinearity, heteroscedasticity, autocorrelation, and hausman test to ensure the regression model used is appropriate and avoid bias result. Multicollinearity testing is typically employed in conventional linear regression models to determine the presence of a linear relationship between variables x. Collinearity between variables x is indicated more by a higher VIF value, with 10 as the acceptable VIF tolerance level. The x variable is considered very collinear if its VIF exceeds 10 (Gujarati D., 2002). Then, model regression with heteroscedasticity generates bias and invalid outcomes during sample testing methods. Heteroscedasticity indicates that the variance of error terms is not homogeneous in the executed model (Mátyás & Sevestre, 2008). Non-constant output in the panel data model could occur between companies or between periods. This study employs Heteroscedasticity analysis utilizing the Breusch-Pagan and Wald test methodologies to ensure the model's execution gives accurate testing outcomes (Das, 2019). Similar to heteroscedasticity, autocorrelation can disrupt the interpretation of regression results during the sample testing. Autocorrelation refers to the presence of inherent correlations or trends between time periods (Gujarati D., 2002). This study used the Wooldridge test for autocorrelation analysis, as this approach effectively accounts for variances between companies and time period variability (Das, 2019). Upon generating the suitable regression model for this study, various tests were conducted to interpret the data, including F-test, t-test, and R-squared.

**RESULTS AND DISCUSSION**

According to Indonesian policies, publicly traded companies have been mandated to provide sustainability reports since 2019. The execution of this plan was postponed until 2021 because of the beginning of COVID-19 (PWC, 2023).As a result, listed companies' sustainability transparency is still slight, which leads to a restricted assessment of companies'

ESG scores. As of November 2024, only 88 publicly traded companies completed ESG reviews. This research utilized 30 firms to represent the 88 companies, based on several reasons. First, this analysis omitted financial institutions since they were unrelated to the dependent variable (Gracia & Siregar, 2021; W. Li et al., 2024). Second, this study utilized companies with ESG scores over the previous five years to examine variations in the cost of capital resulting from annual fluctuations in ESG score assessment. Then, this study is restricted to companies that utilize debt for funding purposes.

**Table 1. Data distribution of the company**

Sector	Number of Observation	
Basic Materials	30	20%
Energy	20	13%
<b>Total Heavy-Polluting</b>	<b>50</b>	<b>33%</b>
Industry	5	3%
Consumer Non-Cyclicals	35	23%
Consumer Cyclicals	10	7%
Healthcare	5	3%
Properties & Real Estate	20	13%
Infrastructures	25	17%
<b>Total Non-Heavy-Polluting</b>	<b>100</b>	<b>67%</b>

Source: Research Data Analyze

Table 1. illustrates the distribution of companies utilized in this study. This research involves 30 companies, each with ESG data over the previous 5 years, resulting in 150 observations. Classification of companies into sectors relies on the categories listed on the IDX. The predominant distribution is found in the consumer noncyclical industries sector (23%) and the basic materials sector (20%). The smallest distribution is found in the industry sector (3%) and healthcare (3%). Consequently, the findings of this study require careful interpretation for the consumer noncyclic industry and healthcare sectors due to insufficient data representation. This research categorizes companies into heavy-polluting sectors (33%) and non-heavy-polluting industries (67%). This categorization aims to mitigate biases by separating industries with significant risks to the environment from those with small environmental risks.

**Table 2. Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Independent Variable</i>					
ESG score	150	50.140	18.906	13.178	88.731
E score	150	42.443	23.885	0.000	83.030
S score	150	56.139	21.443	8.411	95.832
G score	150	49.221	22.104	2.977	94.013
Resource Use	150	44.466	25.888	0.000	93.552
Emissions	150	48.464	26.885	0.000	99.074
Environmental Innovation	150	20.447	29.554	0.000	91.509
Workforce	150	61.619	23.257	8.732	99.020
Human Rights	150	42.439	29.833	0.000	93.973
Community	150	64.720	25.178	7.297	99.180
Product Responsibility	150	53.445	32.913	0.000	98.936
Management	150	48.579	27.574	0.575	98.913



Shareholders	150	51.793	27.903	0.980	99.020
CSR Strategy	150	48.570	31.150	0.000	98.256
<i>Dependent Variable</i>					
Cost of Debt	150	0.147	0.056	0.040	0.347
Cost of Equity	150	0.050	0.024	0.004	0.131
<i>Control Variable</i>					
Book-to-Market Ratio	150	0.725	0.674	-1.711	3.285
Leverage (Debt-to-Equity Ratio)	150	0.917	2.354	-9.038	20.346
Interest Coverage Ratio	150	0.550	1.459	-1.415	11.168
Profitability (Return on Asset)	150	0.066	0.069	-0.190	0.290
Firm-Size (Ln_Asset)	150	17.634	0.590	16.610	18.780
Liquidity (Current Ratio)	150	2.048	1.230	0.230	5.650

Source: Research Data Analysis

Table 2. presents the mean, standard deviation, minimum, and maximum values for the variables utilized in this analysis. The company's average ESG score is 50.14, with a minimum of 13.18 and a high of 88.73. The average ESG score indicates that the firm has a good ESG rating that tends to be in the satisfactory relative ESG class. Table 2. indicates that, alongside the ESG score, listed companies have an average environmental score of 42.44, which is below the social score of 56.14 and the governance score of 49.22. The workforce score has the highest average at 61.62, while the environmental innovation score has the lowest average at 20.45. This indicates that publicly listed companies in Indonesia tend to demonstrate inadequate performance regarding environmental considerations, particularly in the context of generating environmentally-based innovations.

Furthermore, the dependent variable has a restricted distribution for both the cost of debt and the cost of equity, with standard deviations of 0.023 and 0.056, respectively. Compared to worldwide companies (Alves & Meneses, 2024; Chen et al., 2023), Indonesian companies have a higher average cost of capital. Moreover, the cost of capital is frequently employed as a discount rate in corporate valuation and serves as a benchmark for corporations in making investment decisions (Ernst & Woithe, 2024). This study is particularly significant for heavily polluting companies with inadequate environmental performance since they require significant investments for improvement because of government rules and regulations.

This study used the book-to-market (BTM) ratio, debt-to-equity ratio (DER), interest coverage ratio (ICR), return on assets (ROA), natural logarithm of assets (Ln\_asset), and current ratio (CR) as control variables. According to previous studies, these factors might impact the dependent variable. Consequently, these variables are employed to prevent biased outcomes about the relationship between the dependent and independent variables. The statistical findings (Table 2.) indicate that the control variables exhibiting significant variations in this study are the company's current ratio, interest coverage ratio, and leverage (DER). Consequently, large variations in these variables should be considered, as they are presumed to impact the relationship between the score and the cost of capital if these variables significantly impact the cost of capital.

Additionally, correlation analysis between variables is performed to assess the possibility of multicollinearity arising from a strong relationship between them. According to Gujarati D. (2002), two variables exhibiting a correlation beyond 0.8 suggest a possibility for multicollinearity when integrated into a single equation. Correlation analysis indicates that almost all scores have a significant relationship with the ESG score. This is logical as the other scores contribute to the calculation of the ESG score value. Furthermore, the correlation analysis results indicate the absence of collinear variables other than the score that might

disrupt the regression model. Consequently, this study separates the score variables into several regression models to mitigate the risk of multicollinearity in the analysis.

Before identifying the suitable regression model for this research, several tests were performed to mitigate bias in the data analysis interpretation. This study employs multicollinearity, heteroscedasticity, autocorrelation, and Hausman tests. According to Gujarati D. (2002), multicollinearity in a regression model may be assessed using each variable's variance inflation factor (VIF). Values generally acceptable and indicative of the absence of multicollinearity are below 10, applicable to each variable's Variance Inflation Factor (VIF) and the average VIF of all variables included in the regression model. This study separates the scores into several regression models due to the correlation analysis results, which indicate that each score tends to correlate, which might affect the validity of the results. Consequently, this analysis will employ 28 regression models (14 scores and 2 dependent variables). Multicollinearity testing shows that each model of all models used has an average VIF value ranging from 1.29 to 1.45. This indicates that this regression model can be used without multicollinearity interference and avoids biased analysis results.

A heteroscedasticity test is also performed using the suitable method for each fixed and random effect. The study findings indicate that all regression models have a p-value of 0. Consequently, the hypothesis is rejected, indicating that all regression models demonstrate heteroscedasticity significantly. According to (Das, 2019), the regression model with heteroscedasticity will lead to biased or invalid outcomes. Therefore, the regression models must be modified with techniques to mitigate bias arising from heteroscedasticity. Meanwhile, autocorrelation testing indicates that all regression models with the cost of debt as the dependent variable generate p-values significantly exceeding 0.05. However, all regression models with the cost of equity as the dependent variable have a p-value of 0. The varying outcomes may be attributed to fluctuation in the cost of equity during a certain time, which might influence subsequent periods. The cost of debt is mostly influenced by long-term contracts, making it more stable and less sensitive to fluctuations between year periods.

According to (Das, 2019), many techniques exist to mitigate incorrect outcomes resulting from autocorrelation and heteroscedasticity. This study employs two methods, which involve utilizing clustered standard errors and fixed years to account for time effects. Incorporating clustered standard errors into the equation typically increases the standard errors, as clustered standard errors account for variations in residuals across the dataset and within a single company, thereby yielding a more robust standard error for analysis. In addition, The selection of the appropriate panel data method will be determined by the Hausman test. After administering this test, different results were given for each model. The test illustrates the fluctuation of p-value outcomes for each model, highlighting the predominance of random effects models. Only 9 out of 28 regression models are deemed appropriate for the fixed-effect panel data model.

This study utilizes the p-value from the Hausman test to ascertain the appropriate panel data approach for each regression model, even though the initial assumption of this study is individual effect in this data may correlate with the independent variable. The regression model with fixed-effects involves emission scores and environmental innovation scores as the independent variables. This indicates that the scores are highly dependent on individual effects; for instance, certain companies may generate higher emissions as a consequence of their production processes, whereas others may not generate any emissions during their operations, leading to varying emission values based on these attributes.

Following the analysis of multiple regression model tests, 28 regression models were employed utilizing various panel data models (fixed effect or random effect) based on the Hausman test results, incorporating clustered standard errors and year-fixed effects to mitigate bias resulting from autocorrelation and heteroscedasticity. Panel data regression shows that the

ESG score, E score, S score, and G score are not significantly impact the cost of debt. The finding aligns with the research of Gracia and Siregar (2021), indicating that the total ESG score does not affect the cost of debt in ASEAN countries, including Indonesian companies. However, this result goes against the initial hypothesis, which holds that the ESG score's overall performance can lower debtholders' perceptions of risk, lowering the cost of debt. Although the theory suggests that total ESG performance should be able to provide a good signal to debtholders, in practice, Indonesian debtholders are still interested in other aspects. In addition, although these results support the research of Gracia and Siregar (2021), these results show a difference with almost all previous studies that have conducted research on the relationship between ESG combined score and cost of debt in other countries. In Indonesia, research by Satria & Dalimunthe (2024) found that the ESG score only affects the yield spread of bonds issued by companies, while this study adds the fact that the ESG score does not affect the overall debt used by companies in Indonesia.

Despite the Indonesian government adopting numerous policies supporting the integration of ESG factors in investment decisions, including those of debtholders. The findings show that debtholders do not consider overall ESG performance when making investment decisions. Since they appear to focus mostly on current environmental issues and Indonesia's goal of achieving net zero emissions rather than ESG score combined. Table 3. demonstrates a significant negative relationship between the environmental innovation score and the cost of debt for companies outside the heavy-polluting sector. Unlike companies in the heavy-polluting sector, a rise in emissions and environmental innovation scores significantly increases the cost of debt. This may be driven by heavy-polluting industries required to spend higher expenses related to the implementation of green technology, diversification initiatives, and other innovations aimed to reduce significant emissions from their operations, thus raising the risk perception from debtholder, resulting in the increasing company's cost of debt.

**Table 3. Analysis result of the impact score on cost of debt**

Company Score	Sector	Relationship	Impact on CoD
Environmental Innovation Score	Non-Heavy-Polluting	Negative	0.08%
Environmental Innovation Score	Heavy-Polluting	Positive	0.03%
Emission Score	Heavy-Polluting	Positive	0.07%
Human Rights Score	Heavy-Polluting	Positive	0.05%

Source: Research Data Analysis

In addition to emission and environmental scores, this study showed a significant positive relationship between the human rights scores of companies in Indonesia's heavy-polluting industry, indicating that improvements in human rights scores may elevate the cost of debt for these industries. Industries with significant pollution, particularly in the energy and basic materials sectors, typically spend significant expenses related to human rights, including land acquisition, citizen relocation, and compensatory fees for local populations impacted by their operations. Theoretically, when the heavily polluting industry resolves these issues and enhances its Human Rights score, the company is considered to be capable of mitigating its business risk. In practice, the expenses are needed to comply with previously unmet requirements, specifically in the context of Indonesia's energy transition goal for climate change (National Human Rights Commission, 2024).

The study's findings indicate that only a few variables significantly impact the cost of debt. Furthermore, the resulting impact has a high variation, with a significantly positive relationship between heavily polluting industry firms and a negative relationship between non-heavily polluting industry firms. Consequently, hypothesis 1 is considered partially rejected as it is not applicable to all variables across each company.



In addition to several scores that have been mentioned that significantly affect the cost of debt, this study found that several company characteristics simultaneously affect the cost of debt (Table 4.). First, this study found that Indonesian companies that have a higher debt-to-equity ratio and return on assets have a significant negative relationship with the cost of debt. These results are in line with research conducted by Li et.al (2024) in China, which shows that companies with high leverage and profitability tend to get better access and generate low costs. Then, company size was also found to have a significant impact on the cost of capital. This study shows similar results to Gracia & Siregar (2021) that the higher the company's assets, the greater the impact on the increase in the cost of debt. This relationship may occur because larger companies have higher complexity, which eventually elevates the company's risk.

**Table 4. Company Characteristics on Cost of Debt**

<b>Company Characteristics</b>	<b>Relationship</b>
Leverage (Debt to Equity)	Negative
Firm-Size (Ln Asset)	Positive
Profitability (Return on Asset)	Negative

Source: Research Data Analysis

While the total ESG score has no impact on the cost of debt, this contrasts with the ESG score, which significantly impacts the cost of equity. The study results indicate significant differences in the impact of the total ESG score on the cost of equity between the non-heavy and heavy-polluting industries. This study found that the overall ESG score and its pillar scores, including the environmental and social scores, have a significant negative relationship with the cost of equity in the non-heavy polluting industry sector. This indicates that an increase in the ESG score and its pillar in the non-heavy-polluting industry can increase a company's image by reducing a company's cost of equity. Where increasing the ESG score by 1 point can decrease the cost of equity by 0.16%. This aligns with the research conducted by Chen et al. (2023) and the initial hypothesis that the improvement of ESG performance in companies in Indonesia can mitigate business risk and lead to a reduction in the company's cost of equity. However, in contrast with the environmental and social pillar scores, the government pillar score was found to have no direct impact on the cost of equity.

Alongside the ESG score and its pillars (E score, S score, G score), other sub-pillar scores in non-heavy polluting industrial firms show a direct and significant impact on the cost of equity (Table 5.). The sub-pillar scores, including resource use, workforce, and product responsibility scores, show a negative significant relationship with the cost of equity. This indicates that a company's performance in these areas can directly lower the cost of equity for non-heavy polluting industry companies. The resource use score has a more significant impact than the workforce and product responsibility scores, with a one-point rise in the score potentially decreasing the cost of equity by 0.09%. Moreover, the shareholder score in these companies shows a significant positive relationship, indicating that an increase in the company's performance relating to shareholders immediately increases the cost of equity. This relationship indicates that non-heavy polluting industrial firms that overly provide dividends to shareholders may elevate the perceived risk regarding the sustainability of the business. Besides that, several other sub-pillars were identified as having no immediate impact on the cost of equity.

Conversely, the combined ESG score and its component scores show a positive relationship with the cost of equity in the heavy-polluting industrial sector. This indicates that improvement in the ESG score and their component scores in the heavy-polluting industry can increase the company's cost of equity. The cost of equity for companies in the heavy-polluting sector might rise by 0.08% for the increase of every point in the company's ESG score. This result indicates the rejection of the initial hypothesis in this research, which assumes that

improving ESG performance in both non-heavy polluting and heavy polluting industries will lower risk perceptions, therefore lowering the cost of equity. The positive relationship between ESG scores and the cost of equity for heavily polluting industries is aligned with research conducted by Amarna et al. (2024), and this could result from the need for increased investment expenditures in these sectors, thereby lowering short-term earnings.

**Table 5. Analysis result of the impact score on cost equity**

Company Score	Relationship	Impact on CoE
<b>Non-Heavy-Polluting Industry</b>		
ESG Score	Negative	0.16%
E Score	Negative	0.11%
S Score	Negative	0.08%
Resource Use Score	Negative	0.09%
Workforce Score	Negative	0.04%
Human Rights Score	Negative	0.04%
Product Responsibility Score	Negative	0.05%
Shareholder Score	Positive	0.09%
<b>Heavy-Polluting Industry</b>		
ESG score	Positive	0.08%
E score	Positive	0.09%
S score	Positive	0.06%
G score	Positive	0.05%
Resource Use Score	Positive	0.09%
Workforce Score	Positive	0.05%
Community Score	Positive	0.03%
Product Responsibility Score	Positive	0.05%
Management Score	Positive	0.05%
Shareholder Score	Negative	0.14%
CSR Strategy Score	Negative	0.07%

Source: Research Data Analysis

The study showed that specific sub-pillar scores may directly impact the cost of equity in companies within heavily polluting industries (Table 5.). Numerous sub-pillar scores have a positive relationship, including resource use, workforce, community, product responsibility, and management scores. The resource use score has a stronger positive correlation, whereby one point of improvement in the resource use score might lead to a 0.09% rise in the cost of equity. Moreover, other sub-pillar scores have an inverse relationship, including the shareholder score and the CSR strategy score, with a larger impact on the shareholder score (a 1-point rise decreases the cost of equity by 0.14%). This indicates that, in heavily polluting industrial companies, prioritizing shareholder interests and social responsibility is seen as important despite the necessity for large expenditures to achieve Indonesian targets.

The study's findings indicate that there are variables that have no relationship with the cost of equity. The result shows a different impact between the heavy polluting industry and the non-heavy industry, where the majority of results in the heavy polluting industry show a positive relationship, and the majority of results in the non-heavy polluting industry show a negative relationship. Therefore, based on the analysis above, this research is considered partially rejected as it is not applicable to all variables across each company. In addition to the ESG score, this study identified that several scores impact the cost of equity, as well as specific characteristics of the company itself (Table 6.). Various company characteristics, including leverage, interest coverage ratio, and profitability, showed a significant positive relationship with the cost of equity. The company's characteristics in terms of leverage have a relationship whose results align with the research conducted by Amarna et al. (2024) and Chen et al. (2024).

However, on the contrary, the relationship between company characteristics in terms of profitability and cost of equity is different from previous research conducted by Ernst and Woithe (2024), with the object of research being S&P500 companies. This shows differences in the characteristics of investors in Indonesia and globally in response to company profitability. This study shows that companies have high return expectations when they have high profitability. In contrast, firm size had a significant negative relationship with the cost of equity. This aligns with research conducted by Amarna et al. (2024) and Chen et al. (2024), which indicates that investors keep considering these corporate characteristics in their investing decisions, irrespective of the ESG score, which is an increasingly important problem.

**Table 6. Company Characteristics on Cost of Equity**

<b>Company Characteristics</b>	<b>Relationship</b>
Leverage	Positive
Interest Coverage Ratio	Positive
Firm-Size	Negative
Profitability	Positive

Source: Research Data Analysis

## CONCLUSION

This study shows that the increase in ESG performance shown in the ESG combined score has a negative relationship with the cost of equity for non-heavy-polluting industry companies. This means that the increase in the overall ESG score impacts reducing the company's cost of equity. However, not all components in the ESG score directly impact the cost of equity. Components in the ESG score, such as emission and environmental innovation, were found to have no direct impact on the cost of equity. Different results were shown in the cost of debt, where the ESG combined score did not have an impact on the cost of debt. However, components in the ESG score, such as emissions, environmental innovation, and human rights, have a significant impact on the cost of debt directly. Among the ESG components, it was found that resource use and shareholders are the components that have the most significant impact on the cost of equity. At the same time, the ESG components that most affect the cost of debt are the emission and environmental innovation scores.

Although the increase in ESG performance of non-heavy-polluting industry companies results in a decrease in the company's cost of capital, on the other hand, industries included in the heavy-polluting industry, in this case, the energy and basic materials sectors, are found to have challenges because the increase in ESG scores tends to increase the cost of capital which may be due to greater investment for the sector to improve the ESG performance of the sector, thereby increasing the perception of risk for investors and debtholders. These results indicate that regulations in Indonesia to achieve net zero emissions have been effective for some sectors. Due to the impact of ESG scores and their components on the cost of capital, which differ significantly between heavy-polluting industries and non-heavy-polluting industries, the strategies faced by these two characteristics are different. In heavy-polluting industries, research suggests an incremental increase in ESG performance. Meanwhile, in non-heavy polluting industries, companies can continue to improve their ESG performance with the components that have the most significant impact on reducing the cost of capital as a priority.

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