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The Impact of Environmental Innovation, Carbon Emission, and Resource Use on Financial Distress Moderated by Corporate Governance

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Abstract

This study examines the effect of environmental innovation, carbon emission, and resource use on financial distress, with corporate governance as a moderating variable, in companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. The sample was selected using purposive sampling, consisting of 15 companies that consistently published sustainability reports and had environmental scores from Refinitiv LSEG, resulting in a total of 75 observations. Secondary data were obtained from financial statements and sustainability reports, and analyzed using panel data regression with the Fixed Effects Model. The findings reveal that environmental innovation has a significant negative effect on financial distress, while resource use has a significant positive effect. In contrast, carbon emission does not significantly affect financial distress. Regarding the moderating role, corporate governance positively strengthens the relationship between environmental innovation and financial distress, indicating that in the short term, high investment costs in green innovation may increase financial pressure. Meanwhile, corporate governance does not significantly moderate the effect of carbon emission on financial distress, but significantly weakens the positive effect of resource use on financial distress. Overall, the results highlight that environmental innovation is crucial in reducing financial risks, efficient resource management must be optimized, and strong corporate governance serves as a key mechanism to enhance the effectiveness of sustainability strategies.

Keyword: *Environmental Innovation, Carbon Emission, Resource Use, Corporate Governance, Financial Distress*

1. INTRODUCTION

The phenomenon of financial distress has become a primary concern in the stability of businesses and the global economy. This condition reflects the deteriorating financial situation of a company, characterized by liquidity difficulties, an inability to meet financial obligations, and the risk of bankruptcy (Song et al., 2024). In Indonesia, reports from the Indonesia Stock Exchange (2024) indicate that 35 companies are under special monitoring due to negative equity. Negative equity occurs when total liabilities exceed total assets, serving as a key indicator of potential financial distress (Adrianto, 2023).

A real-world example can be seen in PT Garuda Indonesia (Persero) Tbk, which, as of 2024, reported negative equity amounting to IDR 21.37 trillion. This condition is caused by substantial aircraft leasing debts, unresolved operational performance issues, and the prolonged impact of the COVID-19 pandemic. This emphasizes that financial distress is not only experienced by private companies but also by State-Owned Enterprises (BUMN), which face high operational complexities.

To date, research on financial distress has primarily focused on internal financial indicators such as liquidity, leverage, and profitability (Habib, 2023). However, this approach is considered insufficient to comprehensively explain the causes of distress, particularly in the context of modern business sustainability. As global awareness of environmental issues rises, non-financial factors, such as environmental innovation, carbon emissions, and resource use, have increasingly been viewed as crucial determinants for business continuity.

According to Meles et al. (2023), environmental innovation plays a role in reducing default risk, while high carbon emissions increase the risk of distress (Ding et al., 2023). On the other hand, excessive resource use negatively affects efficiency and may reduce a company's financial performance (Ragazou et al., 2022; Abdelhalim et al., 2023). Therefore, managing environmental factors has become a strategic imperative, especially with the implementation of ESG regulations by the OJK.

Furthermore, corporate governance plays a critical role as a moderating variable in managing both environmental and financial risks. Good corporate governance promotes transparency, adaptation to regulations, and the adoption of environmentally friendly innovations (OECD, 2024). Studies in Indonesia also confirm that good governance can mitigate distress potential through operational efficiency and stronger competitiveness (Sudiyatno et al., 2022; Samhadi et al., 2024).

1.1. Financial Distress

Financial distress is a condition in which a company faces serious financial difficulties, characterized by an inability to meet both short-term and long-term financial obligations. Platt and Platt (2002) define financial distress as the stage before bankruptcy, when a company begins to show signs of declining performance and struggles to pay its debts. Ross et al. (2022) further add that this condition is complex because it involves various events such as dividend reductions, operational losses, plant closures, layoffs, management resignations, and falling stock prices. Generally, financial distress occurs when operational cash flow is insufficient to meet obligations, which can eventually lead to insolvency. Insolvency itself is divided into two types: stock-based, where the value of assets is lower than liabilities, and cash-based,

where cash flow cannot cover maturing obligations. If not addressed promptly, this condition can lead to bankruptcy.

Altman et al. (2019) classify financial distress into five categories: economic failure (revenues are less than the cost of capital), business failure (low or negative returns on investment leading to operational shutdown), in default (failure to meet debt obligations), insolvency (inability to pay maturing obligations due to sustained losses), and bankruptcy (negative equity and legal declaration of bankruptcy). Thus, financial distress is a spectrum of financial issues that, if not properly managed, can result in bankruptcy.

1.2. Environmental Innovation

Environmental innovation refers to the development and application of technologies, processes, products, or managerial practices aimed at reducing negative environmental impacts. Kemp & Pearson (2007) define environmental innovation as any form of innovation that results in tangible benefits for the environment, such as emissions reduction, energy efficiency improvements, or sustainable resource management. The OECD (2024) emphasizes that these benefits include resource use efficiency and a reduction in negative impacts throughout the product lifecycle. The main drivers of environmental innovation implementation include regulatory pressure, market demand for low-carbon products, and consumer and investor demands (Albitar et al., 2023). Additionally, success is influenced by the company's internal readiness, such as organizational culture, research and development (R&D) capacity, and commitment to good environmental governance.

The implementation of environmental innovation significantly contributes to reducing the risk of financial distress. This strategy enables companies to reduce long-term energy and operational costs, while also minimizing potential fines due to violations of environmental regulations. Moreover, green innovation strengthens a company's image in the eyes of investors, consumers, and the public, positively impacting market value and financial stability. Companies focused on sustainability also find it easier to access green financing, fiscal incentives, and policy support, which provide greater financial flexibility. Therefore, environmental innovation not only enhances efficiency and competitiveness but also makes companies more adaptable to external pressures and reduces the likelihood of financial distress.

Environmental innovation refers to the application of technologies, processes, or managerial practices aimed at reducing negative environmental impacts while accommodating the interests of stakeholders such as regulators, ESG investors, and consumers. Various studies show that innovation and environmental performance play a

significant role in reducing financial distress risks. Arora & Singh (2025) found that increased environmental disclosure reduces distress risk in non-financial companies in India, while Jia & Li (2022) demonstrated that corporate environmental performance negatively and significantly impacts the probability of distress in Australia. The study by Safiullah et al. (2024) emphasizes that green innovation reduces default risk in U.S. companies, while Atif & Ali (2021) and H. Lin et al. (2025) showed that high ESG scores, particularly in the environmental dimension, contribute to a reduction in the risk of default and bankruptcy. Similar findings were presented by Habib (2023) and EmadEldeen (2024), who stressed that ESG performance and sustainability strategies play a role in lowering distress potential, particularly in financially healthy companies.

H1: Environmental Innovation has a significant negative impact on Financial Distress.

1.3. Carbon Emission

Carbon emission refers to the release of CO₂ gas into the atmosphere, primarily from the burning of fossil fuels in industrial activities, transportation, and business operations. The IPCC (2021) emphasizes that carbon emissions are a major contributor to global climate change, while the OECD (2024) considers them an important indicator for assessing environmental responsibility and business sustainability risks. Under the Greenhouse Gas Protocol framework, a company's emissions are classified into three categories: Scope 1 (direct emissions from production and operational activities), Scope 2 (indirect emissions from the consumption of purchased energy), and Scope 3 (other indirect emissions along the supply chain). This classification is essential for ensuring accurate emissions measurement and reporting.

High carbon emissions have significant consequences for a company's performance and sustainability. Risks include increased compliance costs due to stringent environmental regulations, high operational costs from reliance on carbon-based energy, and a decrease in market and investor confidence (Ren et al., 2025; Liu et al., 2025). Furthermore, high emissions limit access to financing, as many financial institutions now require ESG compliance for investment (Mathur & Purohit, 2024). On a global scale, companies with high carbon footprints also face the risk of losing competitiveness due to increasingly strict green trade policies (Cai & Li, 2025).

High carbon emissions have been identified as a trigger for financial risks, including liquidity constraints and limited access to financing, which ultimately increases the potential for financial distress. Ren et al. (2025) found that carbon risk negatively impacts a company's ability to secure debt, while Amarasuriya et al. (2024) showed that companies with lower

emissions are more resilient to financial pressures. Therefore, carbon emission management not only serves as a form of environmental responsibility but also as an essential strategy for maintaining financial stability and competitiveness in the transition to a green economy.

H2: Carbon Emission has a significant negative impact on Financial Distress.

1.4. Resource Use

Resource use reflects a company's capacity to reduce the consumption of materials, energy, and water through the implementation of efficiency practices and more sustainable supply chain management (LSEG, 2025). Excessive resource utilization encourages companies to raise environmental awareness by reducing their ecological footprint and optimizing operational efficiency (Ragazou et al., 2022; Burns et al., 2020). The concept of eco-efficiency, according to Abdelhalim et al. (2023), emphasizes strategies for efficient resource use to achieve both economic goals and environmental sustainability.

Several studies indicate that the implementation of eco-efficiency has a positive impact on sustainability performance and reflects high energy efficiency (Pratiwi et al., 2020; Kurnianta & Dianawati, 2020; Safitri & Nani, 2021; Dakhli, 2022). However, the findings of Damas et al. (2021) present a contrasting view, showing that eco-efficiency proxies negatively impact firm value. These differing research outcomes suggest that the effectiveness of resource efficiency strategies greatly depends on the context of implementation, industry conditions, and the governance mechanisms employed by the company.

H3: Resource Use has a significant negative impact on Financial Distress.

1.5. The Impact of Environmental Innovation on Financial Distress Moderated by Corporate Governance

The study by Khan et al. (2023) shows that an effective board composition can enhance the contribution of green innovation to financial performance, although this effect has not yet been significant in Indonesia. The findings emphasize that the financial benefits of green innovation can only be optimized when supported by good corporate governance practices, such as transparency, accountability, and strategic oversight. Furthermore, Samhadi et al. (2024) found that green innovation does not directly affect firm value, but good corporate governance (GCG) can moderate and strengthen this relationship. Given that an increase in firm value is typically inversely related to financial distress risk, it can be concluded that GCG plays a crucial role in reinforcing the impact of environmental innovation on reducing distress. Thus, good corporate governance not only enhances the effectiveness of environmental innovation but also serves as an oversight mechanism to mitigate financial pressures.

H4: Corporate Governance negatively moderates the impact of Environmental Innovation on Financial Distress.

1.6. The Impact of Carbon Emission on Financial Distress Moderated by Corporate Governance

The study by Ding et al. (2023a) shows that companies with high levels of carbon emissions face a greater risk of financial distress due to regulatory pressures, potential environmental fines, and decreasing investor confidence. However, Ding et al. (2021) found that corporate governance plays a critical role in mitigating these negative impacts. A strong governance structure, such as the presence of independent boards and institutional ownership, allows companies to implement more proactive environmental strategies, thus reducing financial risks associated with carbon emissions. This underscores the role of corporate governance as a moderating variable that enhances a company's resilience to both environmental and financial pressures.

H5: Corporate Governance negatively moderates the impact of Carbon Emission on Financial Distress.

1.7. The Impact of Resource Use on Financial Distress Moderated by Corporate Governance

The study by Leung et al. (2014) shows that companies efficient in resource use – such as materials, energy, and water – tend to have higher performance and firm value. This aligns with the resource-based view (RBV), which asserts that resource efficiency provides a competitive advantage and financial stability. Additionally, corporate governance plays a crucial role in strengthening the impact of resource efficiency on firm performance and value. Good governance, such as a strong independent board and institutional ownership, enables more effective sustainability strategy management, enhances transparency, and maintains investor trust. An increase in firm value ultimately reduces the likelihood of financial distress by strengthening access to funding, lowering bankruptcy risk, and enhancing resilience to external pressures. Thus, corporate governance functions as a moderating variable that weakens the negative impact of resource use on financial distress.

H6: Corporate Governance negatively moderates the impact of Resource Use on Financial Distress.

2. METHOD

This study is a quantitative research with a hypothesis testing design aimed at testing the relationships between independent and dependent variables, whether they are positively or negatively related (Sekaran, 2016). This approach is used to prove the hypothesis of the influence of environmental variables on financial distress. The population of the study

includes all companies listed on the Indonesia Stock Exchange (IDX) during the period 2020–2024, while the sample is determined using a purposive sampling method with the following criteria: (1) companies listed on the IDX from 2020 to 2024, (2) companies that issued a sustainability report during the period, and (3) companies that have an Environmental Innovation Score, Emission Score, and Resource Use Score on the Workspace Refinitiv LSEG.

The data used in this study is secondary data in the form of financial reports and sustainability reports obtained from the official IDX website and Workspace Refinitiv LSEG. Data collection is done through a non-participant observation method, where the researcher is not directly involved in the company's activities, but instead observes data available from official and credible sources. This approach ensures that the data used is valid, reliable, and relevant to support the research analysis.

This study uses a quantitative approach with panel data regression analysis to test the effects of environmental innovation, carbon emissions, and resource use on financial distress, as well as the moderating role of corporate governance. Data analysis is conducted with the help of statistical software STATA 17 for Windows, which supports panel model estimation.

The formula for this research is as follows:

$$FD = \alpha + \beta_1 EI + \beta_2 CE + \beta_3 RU + \beta_4 ROA + \beta_5 CR + \beta_6 DAR + \beta_7 EI * CG + \beta_8 CE * CG + \beta_9 RU * CG + \varepsilon$$

3. RESULTS AND DISCUSSION

3.1. Descriptive Statistics

Table 3.1 Results of Descriptive Statistics Analysis

Variabel	Obs	Mean	Std. dev.	Min	Max
FD	75	13.790	3.884	0.001	17.090
EI	75	55.856	22.288	7.874	95.902
CE	75	58.361	22.260	12.722	94.886
RU	75	59.995	20.096	6.552	99.091
ROA	75	0.086	0.077	-0.035	0.349
CR	75	2.252	1.560	0.446	8.173
DAR	75	0.507	0.192	0.189	0.866
CG	75	43.182	19.152	5.026	87.508

Source: Data Processed with Stata 17

The descriptive statistics in Table 3.1 show 75 observations for each variable. The Financial Distress (FD) variable has a mean of 13.790 and a standard deviation of 3.884, indicating variation in financial difficulties across companies. Environmental Innovation (EI) has a mean of 55.856 with a standard deviation of 22.288, reflecting diverse levels of innovation. Carbon Emission (CE) has a mean of 58.361 with a standard deviation of 22.260, showing significant differences in emissions across companies. Resource Use (RU) has a mean of 59.995 with a standard deviation of 20.096, indicating variation in resource efficiency.

For control variables, Return on Assets (ROA) has a mean of 0.086 with a standard deviation of 0.077, indicating relatively low profitability. The Current Ratio (CR) has a mean of 2.252 with a standard deviation of 1.560, suggesting generally good liquidity but with some extreme variations. Debt to Asset Ratio (DAR) has a mean of 0.507 with a standard deviation of 0.192, indicating a balanced capital structure. Corporate Governance (CG) has a mean of 43.182 with a standard deviation of 19.152, emphasizing significant differences in governance quality among companies.

3.2. Classical Assumption Test

Table 3.2 Skewness and kurtosis tests for normality

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Joint Test	
				Adj chi2(2)	Prob>chi2
data_residual	75	0.5292	0.3594	1.27	0.5292

Source: Data Processed with Stata 17

The results of the normality test using the skewness and kurtosis methods show that the residual data follows a normal distribution. The p-value for skewness is 0.5292 (>0.05), indicating no significant skewness, while the p-value for kurtosis is 0.3594 (>0.05), suggesting that the distribution shape is approximately normal. The combined test produces a p-value of 0.5292 (>0.05), so the null hypothesis that the residuals are normally distributed cannot be rejected. Therefore, it can be concluded that the residuals in this research model are approximately normally distributed.

Table 3.3 Multicollinearity Test

Variable	VIF	1/VIF
CR	1.71	0.584179
CE	1.54	0.650024
DAR	1.41	0.709563
ROA	1.23	0.811618
RU	1.21	0.829617
EI	1.14	0.875201

Mean VIF 1.37

Source: Data Processed with Stata 17

The multicollinearity test using the Variance Inflation Factor (VIF) indicates that all independent variables have VIF values below conventional concern thresholds, suggesting no serious multicollinearity. The average VIF is 1.37, and the corresponding tolerance values ($1/VIF$) exceed 0.10, confirming that intercorrelations among the independent variables are low. Accordingly, the regression model can be deemed free from multicollinearity, and subsequent regression analyses may proceed without material constraints.

Table 3.4 Heteroscedasticity Test

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: data_residual
H0: Constant variance
chi2(1) = 1.02
Prob > chi2 = 0.3115

Source: Data Processed with Stata 17

The results of the Breusch-Pagan/Cook-Weisberg test show a $\chi^2(1)$ value of 1.02 with a probability of 0.3115 (>0.05), indicating that the null hypothesis cannot be rejected. This suggests that the residual variance is constant, or homoscedastic, meaning that the regression model does not experience heteroscedasticity issues.

3.3. Model Selection Test

Table 3.5 Chow Test

Test	Test Indicator		Information
Chow Test	F(10, 64)	12.12	Model FEM
	Prob > F	0.000	

Source: Data Processed with Stata 17

The results of the Chow test indicate that the Fixed Effects Model (FEM) is more appropriate than other models. The test yielded an F value of 12.12 with degrees of freedom (10, 64) and a p-value of 0.000, further supporting that the FEM is the most suitable model. Overall, the Chow test results suggest that the Fixed Effects Model (FEM) is the most appropriate for this study, as it can explain significant differences in the panel data that cannot be captured by alternative models such as Pooled OLS or Random Effects.

Table 3.6 Hausman Test

Test	Test Indicator		Information
Hausman Test	chi2(9)	73.78	Model FEM
	Prob > chi2	0.0000	

Source: Data Processed with Stata 17

The results of the Hausman test indicate that the Fixed Effects Model (FEM) is more appropriate than the Random Effects Model (REM). The test yielded a chi-squared statistic of 73.78 with 9 degrees of freedom and a p-value of 0.0000. This very small p-value further suggests that the FEM is more appropriate than the REM. Overall, the Hausman test results show that the Fixed Effects Model (FEM) is better suited for use, as it provides more consistent and efficient estimates compared to the Random Effects Model.

3.4. Hypothesis Testing

Table 3.7 t-Test Result

FD	Coefficient	Std. err.	t	P>t	[95% conf. interval]	
EI	-5.394513	2.145572	-2.51	0.015	-9.704021	-1.085004
EI*CG	0.0993407	0.0374995	2.65	0.011	0.0240207	0.1746608
CE	-0.0273186	0.0284783	-0.96	0.342	-0.0845189	0.0298817
CE*CG	0.0007811	0.0006367	1.23	0.226	-0.0004979	0.00206
RU	0.0812267	0.0249473	3.26	0.002	0.0311185	0.1313349
RU*CG	-0.0011716	0.0005457	-2.15	0.037	-0.0022677	-0.0000755
ROA	-10.84037	4.388735	-2.47	0.017	-19.6554	-2.025334
CR	-0.0285362	0.3120364	-0.09	0.927	-0.6552798	0.5982075
DAR	5.668463	5.414492	1.05	0.3	-5.206865	16.54379
CG	-0.3470411	0.1510283	-2.3	0.026	-0.6503903	-0.0436919
_cons	28.76099	8.939616	3.22	0.002	10.80524	46.71673

Source: Data Processed with Stata 17

The t-Test results show that Environmental Innovation (EI) has a significant negative effect on Financial Distress (FD), with a p-value of 0.015, indicating that higher environmental innovation reduces the likelihood of financial distress. Corporate Governance (CG) positively moderates this relationship with a significant p-value of 0.011. Resource Use (RU) has a significant positive effect on FD, with a p-value of 0.002, meaning that higher resource use increases the likelihood of financial distress. However, CG negatively moderates this relationship (p-value = 0.037), reducing the impact of resource use on FD.

Return on Assets (ROA) has a negative effect on FD, with a p-value of 0.017, suggesting that lower profitability increases the risk of financial distress. CG also significantly lowers the risk of FD, with a p-value of 0.026. On the other hand, Current Ratio (CR), Debt to Asset Ratio (DAR), and Carbon Emission do not significantly affect FD, as their p-values are greater than 0.05.

Table 3.8 F-Test Result

F(10,50)	3.85
Prob > F	0.0007

Source: Data Processed with Stata 17

The F-Test results indicate that the regression model is statistically significant overall. The F value is 3.85 with a Prob > F of 0.0007, which is less than 0.05. This indicates that the regression model is statistically significant, and the coefficients in the model are not all equal to zero, meaning that this model can significantly explain the variation in the dependent variable.

Table 3.9 R² Test Results

R-squared	0.6545
Adj R-squared	0.6005

Source: Data Processed with Stata 17

The results of the R² test in Table 4.1 show the R-squared (R²) and Adjusted R-squared (Adj R²) values. R-squared represents the proportion of the variability in the data that is explained by the regression model. In the table above, the R² value of 0.6545 indicates that the model explains 65.45% of the variability in the data.

3.5. Discussion

The Impact of Environmental Innovation on Financial Distress

The results of the study indicate that Environmental Innovation (EI) has a significant negative effect on Financial Distress (FD). These findings support stakeholder theory, where environmental innovation strengthens relationships with investors, regulators, and NGOs, thereby reducing the risk of sanctions, litigation, and market boycotts. This result is consistent with the research of Arora & Singh (2025), Jia & Li (2022), Safiullah et al. (2024), and H. Lin et al. (2025), which asserts that environmental innovation and ESG performance can reduce the risk of default and bankruptcy. Thus, EI serves not only as a social responsibility but also as a financial risk mitigation strategy.

The Impact of Carbon Emission on Financial Distress

Carbon Emission (CE) shows a negative but insignificant effect on Financial Distress (FD), leading to the rejection of the hypothesis. While high carbon emissions are often identified as a signal of inefficiency and a potential increase in financial risk (Ding et al., 2023a), the results of this study suggest that the impact does not directly manifest within the analysis period. This may be due to the fact that companies have implemented mitigation strategies, adapted to regulations, or have long-term plans to reduce emissions (Meles et al., 2023). Although not significant, carbon emission management remains important as part of a sustainability strategy.

The Impact of Resource Use on Financial Distress

Resource Use (RU) has a significant positive effect on Financial Distress (FD), contrary to the initial hypothesis. This means that higher resource usage increases the risk of financial distress. This finding is consistent with the views of Burns et al. (2020) and Abdelhalim et al. (2023), who argue that excessive resource consumption adds operational costs and weakens a company's liquidity. This variation in results can also be explained by the characteristics of resource-intensive industries, which require significant investments to achieve eco-efficiency. Therefore, resource efficiency becomes a crucial challenge in reducing financial distress.

The Impact of Environmental Innovation on Financial Distress Moderated by Corporate Governance

The results of the study indicate that Corporate Governance (CG) positively and significantly moderates the relationship between Environmental Innovation (EI) and Financial Distress (FD), contrary to the initial hypothesis. While CG supports accountability and encourages the adoption of sustainability strategies (Li, Wang, & Liu, 2022), the high initial investment costs of EI in the short term increase financial pressure. Consistent with Testa et al. (2018), the positive impact of EI is only visible in the long term, meaning that within the five-year research horizon, the initial financial burden remains more dominant.

The Impact of Carbon Emission on Financial Distress Moderated by Corporate Governance

The moderation effect of Corporate Governance (CG) on the relationship between Carbon Emission (CE) and Financial Distress (FD) is not significant. Although good governance is expected to reduce environmental risks, its effectiveness largely depends on managerial commitment to implementing sustainability policies (Todaro et al., 2021). Regulatory pressures and investor perceptions regarding high emissions are often stronger than the mitigation actions that CG can undertake, limiting its impact on FD (Ding et al., 2023a).

The Impact of Resource Use on Financial Distress Moderated by Corporate Governance

The results of the study show that Corporate Governance (CG) negatively and significantly moderates the effect of Resource Use (RU) on Financial Distress (FD). This means that good corporate governance strengthens the effectiveness of resource efficiency strategies, reduces operational costs, and maintains financial stability. In line with Leung et al. (2014) and Boubaker et al. (2020), resource efficiency supported by good governance enhances firm value, strengthens competitiveness, and reduces the risk of bankruptcy. Thus, CG proves to mitigate the negative impact of resource use on financial distress.

4. CONCLUSION AND IMPLICATIONS

The results of the study show that Environmental Innovation has a significant negative effect on Financial Distress, meaning that environmental innovation is effective in reducing financial distress risk through strengthening relationships with stakeholders and improving financial stability. Meanwhile, Carbon Emission is negatively related to Financial Distress but not significant, indicating that its impact on financial risk has not yet materialized in the short term, although it may become more significant in the future. Resource Use has a significant positive effect on Financial Distress, indicating that the higher the resource consumption, the greater the risk of financial distress, emphasizing the need to optimize efficiency.

In terms of moderation, Corporate Governance exacerbates the impact of Environmental Innovation on Financial Distress in the short term due to the high initial investment costs of innovation. However, it significantly weakens the impact of Resource Use on Financial Distress by promoting resource efficiency. Conversely, Corporate Governance's moderation on the impact of Carbon Emission is not significant, suggesting that other external factors play a more dominant role in managing carbon emission-related risks.

This study provides empirical evidence on the impact of environmental innovation, carbon emission, and resource use on financial distress with corporate governance as a moderating variable in companies in Indonesia. The findings indicate that Environmental Innovation plays a significant role in reducing the risk of financial distress, suggesting that companies need to integrate environmental innovation into their long-term strategy as a sustainability effort and financial risk mitigation. Furthermore, Corporate Governance proves to be crucial in enhancing resource efficiency, indicating that companies should strengthen their governance structure, particularly transparency and oversight, to ensure the effective implementation of sustainability policies. Thus, policies based on environmental innovation and good governance not only improve environmental performance but also strengthen the company's financial stability in the long term.

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