

The Potential of Carbon Emission Disclosure as a Foundation for Business Sustainability in Mining Companies in Indonesia

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ABSTRACT

This study aims to analyze the influence of environmental performance and financial performance on business sustainability with carbon emission disclosure as a moderating variable. This study was conducted on coal mining manufacturing companies listed on the Indonesia Stock Exchange (IDX). This research is a quantitative study so that the type of data used is documentary data. While the data sources used in this study are secondary data. The number of samples in this study is 20 samples. The research method used is moderated regression analysis obtained from annual reports and company sustainability reports.

Research results show that environmental performance has a positive and significant impact on business sustainability. Financial performance has a positive and significant impact on business sustainability. Carbon emissions disclosure strengthens the influence of environmental performance on business sustainability. Carbon emissions disclosure does not strengthen the influence of financial performance on business sustainability.

Keywords: Environmental Performance, Financial Performance, Business Sustainability

INTRODUCTION

The development of the capital market in Indonesia is currently experiencing rapid progress. This progress has fueled investor interest in investing in the capital market. The existence of this capital market provides investors with a tool to measure a company's performance and financial condition through financial reports, which contain information on the entity's financial position, financial performance, and cash flow, which is useful for investment decision-makers [1].

A company's achievements are influenced by every activity the company does in utilizing its resources. Therefore, company performance is one of the important things that every company must achieve. The higher the economic level of a country, the tighter the competition between companies will be followed, which will certainly affect the company's existence [2]. Therefore, the public wants companies to be responsible for the environment by minimizing the negative impacts of company operations. When companies generate an impact on the sustainability of nature and the environment that is increasingly large due to the influence of company activities, this is where the function of the accounting field is used to assist in environmental conservation [3].

Business continuity is the assumption that an entity will remain in business for the foreseeable future. The entity will not be forced to cease operations and liquidate assets in the near future. Business sustainability will only be assured if social and environmental dimensions are taken into account. The essence of corporate social responsibility is to strengthen the sustainability of the company itself by building collaborative pathways between stakeholders [4].

Business sustainability assumes that a company will continue to exist, meaning that it is expected that there will be no liquidity in the future. The assumption of business sustainability means that a business entity is considered to be able to maintain its business activities in the long term and will not be liquidated in the short term. One of the factors that influence business sustainability is environmental performance and financial

performance [5] .

Research by Fathia & Virna (2023) found that environmental performance has a positive and significant impact on business sustainability. Environmental performance is part of a company's efforts to enhance its positive image by paying attention to the environment. Environmental performance is a crucial aspect of a company because it reflects how the company manages the environment. A company with good environmental performance can gain positive feedback from the public, especially investors.

Environmental performance is the achievement of an organization by using the company's capabilities and reducing the negative effects of the company's business operations on the environment [7] . Environmental performance will be reported in environmental disclosures to meet stakeholder demands so as to maintain stakeholder trust in the company [8] . Environmental disclosure is information about environmental issues that affect the company's future activities, risks, and the company's environmental policies [9] .

With increasing awareness of the importance of sustainability, companies are required to focus not only on profit , but also on sustainable operations that minimize negative impacts on the environment and society [10], [11], [12] . Evaluating financial performance within this sustainability framework requires a more inclusive and comprehensive approach.

Saputri's (2019) research revealed that financial performance positively impacts business sustainability. Evaluating financial performance using metrics such as asset management, debt management, and market value performance provides insight into a company's sustainability position across various sectors. However, this contrasts with research by Prena & Diarsa (2019) , which found that financial performance had no impact on business sustainability.

One way to assess the efficiency of a business's financial performance in financial management is to use profitability ratio analysis. Profitability analysis is necessary to assess the size of a business's financial performance.

A company's business productivity. Profitability ratios indicate a company's ability to generate profits over a certain period. This ratio provides an overview of the company's management effectiveness. Investors can use a company's profitability ratio as a tool to measure the capital invested in the company [13] .

One ratio commonly used to measure a company's financial performance is Return on Assets (ROA) [14] . Return on Assets is a ratio based on a company's total assets, which describes the company's ability to generate profits. According to Putri et al. (2022), Return on Assets is a ratio used to measure a company's ability to generate profits because it represents the return on the company's activities. A higher return on assets means a higher amount of net profit generated for each rupiah of funds invested in total assets. Conversely, a lower return on assets means a lower amount of net profit generated for each rupiah of funds invested in total assets.

The indicator that can maintain the company's sustainability is Carbon Emission Disclosure . Fathia & Virna (2023) stated that carbon emission disclosure can also be one of a company's efforts to maintain sustainability. Disclosure of carbon emissions by a company not only informs about the amount of carbon emissions produced but also the company's plans to reduce carbon emissions. A good company can be identified by the minimal carbon produced by its activities and the decreasing decline each year. Reducing carbon emissions is one of a company's efforts to protect the environment. This can encourage corporate sustainability, thus concluding that carbon emission disclosure has an impact on corporate sustainability.

The entry of investors, both individuals and business entities, into Indonesian companies has generated many benefits for Indonesia, especially mining sector companies in Indonesia [16] . With the addition of new capital, national economic growth and mining sector development can develop even better. In addition, there are costs that arise from conflicts of interest between companies and the government adopted by large companies, namely political costs . Large companies adopt more political costs than other small companies and tend to carry out profit management to reduce these costs. The company's management system is still considered weak towards environmental aspects, which can be seen from environmental performance measurements.

Based on the above description, further development of business sustainability is necessary to more effectively meet the financial information needs of various types of companies, including those in the service, trade, and manufacturing sectors. This development is expected to increase the relevance and accuracy of business sustainability in providing the information required by users, while also supporting the fulfillment of business needs, particularly in specific industrial sectors such as coal production.

Although various previous studies have examined the relationship between environmental performance, financial performance, and business sustainability, there are still research gaps that need to be addressed. First, previous research results show inconsistent findings regarding the influence of financial performance on business sustainability across various industry contexts. Second, most previous research focuses on developed countries, while studies in emerging markets like Indonesia are still limited. Third, the integration of environmental performance and carbon emission disclosure as a moderating variable has rarely been explored empirically. Fourth, the carbon disclosure approach used in previous studies tends to be descriptive and has not considered its strategic role in strengthening business sustainability. Therefore, this study seeks to fill this gap by empirically testing the role of carbon emission disclosure as a moderating variable in the relationship between environmental performance, financial performance, and business sustainability in mining companies in Indonesia.

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Theory Stakeholders : According to Freeman (1984), stakeholder theory explains that companies have relationships with stakeholders who directly influence each other (between the company and stakeholders) through the company's actions. Stakeholder theory emphasizes that company operations not only work to meet financial goals, but must also provide benefits to stakeholders to maintain the operations carried out by the organization. This theory aims to have a strong bond between the company and its stakeholders, so that sustainable success is achieved [18]

Legitimacy Theory: Davis & Blomstrom (1968) are social scientists who have contributed to the development of legitimacy theory. They developed ideas about organizational legitimacy and how organizations must adapt to changes in the social environment to maintain support and continuity of their businesses. According to Ghozali & Charir (2007), legitimacy theory suggests that a business entity can ensure its operations comply with the norms and regulations applicable in its environment. The disclosure approach by companies aims to encourage companies to be proactive in addressing environmental issues and ensure that stakeholder principles are considered by all parties involved in the company. Legitimacy theory identifies that the purpose of social responsibility disclosed by companies is to gain legitimacy from the operational environment, maximize long-term financial strength, and be able to create harmony with public perception (Amaliyah & Puspawati, 2022).

Environmental Performance: Corporate environmental performance according to Bahri & Cahyani (2016) is the company's performance in finding good (green) areas. Environmental performance is the measurable and quantifiable results of an environmental management system, which is related to the inspection of its environmental aspects, where the environmental performance assessment is based on environmental policies, environmental targets, and environmental targets.

Financial performance: Company performance is a formal effort undertaken by a company to evaluate the efficiency and effectiveness of its activities over a specific period of time. Financial performance is an analysis conducted to determine the extent to which a company has properly and correctly implemented financial regulations (Fahmi, 2011).

Carbon Emission Disclosure: Carbon emissions are the release of gases containing carbon compounds into the atmosphere due to the combustion of carbon-containing compounds [6] . Disclosure of carbon emissions by companies not only informs about the amount of carbon emissions produced, but also the company's plans to reduce the carbon emissions produced. By disclosing carbon emissions, the public and investors will know how much emissions are produced and how the company is trying to reduce the carbon emissions produced.

Business Sustainability: The concept of sustainability first emerged in Stockholm during an environmental

conference in 1972. The theory of sustainability was first proposed by Meadows et al., (1972), who stated that companies prioritize economic, social, and environmental issues. Sustainability within the company itself is a plan to maintain the company's sustainability by balancing the interests of stakeholders (Pemer et al , 2020).

METHOD STUDY

Research Type and Location: This is a quantitative study, therefore, the data used is documentary. The data sources for this study were obtained from coal mining manufacturing companies listed on the Indonesia Stock Exchange.

Research Approach: This research is a type of causal comparative research .

Population and Sample: The population used in this study were companies listed on the Indonesia Stock Exchange for the 2019-2024 period. The sample consisted of 20 companies.

Method of collecting data In accordance with the type of data used, namely secondary data, the data collection method used in this study is documentation. The documentation method involves tracing selected annual reports and samples. Documentation can be done by studying relevant data, either from the library or through websites, to obtain information related to the research variables. Annual reports can be obtained from manufacturing companies listed on the Indonesia Stock Exchange from 2019 to 2024.

Data Analysis Techniques : The data analysis used in this study uses the assistance of the Statistical Package for the Social Sciences (SPSS) version 29 program with a panel data regression analysis model and moderated regression analysis or what is called absolute assumptions.

Descriptive statistics describe or provide an overview of the object being studied through sample or population data (Sugiyono, 2017). To describe variables so that they are easier to understand, descriptive statistics are used, which produce average (mean), minimum, maximum, and standard deviation values.

Hypothesis Testing

Logistic Regression Analysis: The reason for using logistic regression analysis is because the dependent variable of this researcher is business continuity which is dummy . Logistic regression is a special form where the dependent variable is divided into two parts or groups (binary). Although the formula can be more than two groups. Logistic regression is a regression used to find a regression equation if the dependent variable is a variable in the form of a binary logistic regression scale used to find a regression equation where the dependent variable is a two-choice categorical type (Pratiwi, 2013). The analysis model used in this study is logistic regression analysis which is shown by the following equation:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + e$$

Information :

Y : Business Sustainability

a : Constant

β_1 : Regression coefficient X_1

β_2 : Regression coefficient X_2

X_1 : Environmental Performance

X_2 : Financial Performance

e : Standard Error

The stages in testing using logistic regression can be explained as follows.

Assessing the feasibility of the regression model: The feasibility of the regression model is assessed using the Hosmer and Lemeshow's Goodness of Fit Test . Hosmer and Lemeshow's Goodness of Fit Test tests the null hypothesis that the empirical data fits or is in accordance with the model (there is no difference between the model and the data so that the model can be said to be fit). If the statistical value of Hosmer and Lemeshow's Goodness of Fit Test is equal to or less than 0.05, then the null hypothesis is rejected which means there is a significant difference between the model and its observed values so that the Goodness of Fit of the model is not good because the model cannot predict its observed values. If the statistical value of Hosmer and Lemeshow's Goodness of Fit Test is greater than 0.05, then the null hypothesis cannot be rejected and means the model is able to predict its observed values or it can be said that the model is acceptable because it fits its observed data.

Assessing the overall model fit : The overall model fit is assessed by comparing the value between 2 Log Likelihood (-2LL) at the beginning (Block Number = 0), where the model only includes a constant with a value of -2 Log Likelihood (-2LL) at the end (Block Number = 1), where the model includes a constant and independent variables. If the value of -2LL Block Number = 0 > the value of -2LL Block Number = 1, this indicates a good regression model or in other words the hypothesized model fits the data.

Coefficient of determination (Nagelkerke R square): The value of the coefficient of determination in the logistic regression model is indicated by the value of Nagelkerke R square . The value of Nagelkerke R square shows the variability of the dependent variable that can be explained by the variability of the independent variable, while the remainder is explained by other variables outside the research model.

Classification table: A classification table shows the predictive power of a regression model in predicting the likelihood of a dependent variable occurring. The predictive power of 45 regression models in predicting the likelihood of a dependent variable occurring is expressed as a percentage. This table shows or contains data groupings, which can be classified into single and multiple classification tables.

Logistic regression model formed and hypothesis testing: Parameter estimates from the model can be seen in the output Variables in the Equation. Outputs The variables in the equation show the regression coefficient values and their significance levels. The regression coefficients of each tested variable indicate the form of the relationship between the variables. Hypothesis testing in this study is a one-sided test conducted by comparing the significance level (sig) with the error level (α) = 5%.

Test Using the Absolute Difference Test Method: The potential of moderating variables in increasing or decreasing the impact of the independent variable on the dependent variable is tested using moderated regression analysis. The absolute value difference test is conducted by finding the standardized absolute value difference between the two independent variables. If the absolute value difference between the two independent variables is significantly positive, then the variable moderates the relationship between the independent variable and the dependent variable. The following is a regression formula model for testing the moderating effect in this study:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_1 X_3 + \beta_5 X_2 X_3 + e$$

Information:

Y : Corporate Sustainability

a : Constant

β_1 : Regression coefficient X1

β_2 : Regression coefficient X2

X 1 : Environmental Performance

- X 2 : Financial Performance
- X 3 : Carbon Emission Disclosure
- X1X3 : Carbon Emission (interaction of X1 and X3)
- X2X3 : Carbon Emission (interaction of X2 and X3)

e : Standard Error

This study has several methodological limitations. First, the study's scope only focused on coal mining companies listed on the Indonesia Stock Exchange, so the results cannot be generalized to other sectors. Second, the relatively small sample size of 20 companies may limit the model's generalizability. Third, this study relies on secondary data in the form of annual reports and sustainability reports, which may have varying levels of disclosure between companies. Fourth, the carbon emission disclosure variable is measured based on an analysis of public documents, so it does not fully reflect actual company practices in the field.

Operational Definition

Independent Variable (X): An independent variable is a variable that is the cause or factor that can influence another variable (the dependent variable). This variable is independent of other variables and is considered a factor that contributes to change. The independent variables in this study are as follows:

Environmental Performance (X1) : Environmental performance is a company's ability to manage its environmental impacts from its operational activities. According to Suratno et al ., (2007) a company's environmental performance is the company's performance in creating a good (green) environment. Environmental performance assessment is measured by the PROPER rating assessment conducted by the Ministry of Environment, where the purpose of the assessment is to improve the company's performance in environmental conservation. PROPER, which is an environmental rating program from the Ministry of Environment, for example, is a ranking based on the environmental performance of each company, so that it can be compared and become a correction for the company [24] . A company's environmental performance is considered good and supportive if it is reflected in the color category given in PROPER to its activities or activities (Angelina et al., 2023). The following are the criteria for giving scores on the PROPER scale used, including:

Table 1 PROPER Level Scoring

Color	Category	Score
Gold	Very good	5
Green	Good	4
Blue	Enough	3
Red	Bad	2
Black	Very bad	1

Source: Processed data (2024)

Financial Performance (X2) ; Financial performance is the ability of a company or organization to manage financial resources to achieve goals and objectives. According to Fahmi (2011), the definition of financial performance is an analysis conducted to determine the extent to which a company has implemented financial regulations properly and correctly. In this study, financial performance can be measured based on the

company's profitability ratio, namely by using Return on Assets (ROA). The profitability ratio is used to assess a company's ability to generate profits or gains within a certain period. The ROA formula used refers to the research of Wijaya et al., (2021):

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

Dependent Variable (Y): In research on going concern audit opinions, dummy variables are used to categorize a condition into a binary value (0 or 1), so that it can be analyzed using logistic regression. The commonly used dependent variable is the going concern audit opinion, where a value of 1 indicates the company did not receive a going concern audit opinion, while a value of 0 indicates the company received the opinion. Some independent variables are also often converted into dummy variables, such as the history of previous audit opinions 1 = did not receive a going concern opinion, 0 = received a going concern opinion if the auditor adds a special paragraph if there is substantial doubt about the entity's ability to continue as a going concern. Sentence the key usually like:

"There is a material uncertainty that may cast significant doubt on the entity's ability to continue as a going concern."

Moderating Variable (M) A moderating variable is a variable that influences the relationship between the independent variable and the dependent variable. A variable can strengthen, weaken, or change the direction of the relationship between the two variables. The moderating variable used in this study is carbon emission disclosure. Carbon emission disclosure was measured using a checklist based on research by Choi et al. (2013). The checklist was based on an information request form provided by the Carbon Disclosure Project (CDP). CDP is an independent non-profit organization that holds a disseminated volume of climate change information worldwide, comprising more than 3,000 organizations in 60 countries. The checklist was used to obtain information on the extent of climate change and carbon emission disclosures available in the company's annual report. According to Choi et al., (2013) determined five major categories relevant to climate change and carbon emissions as follows: climate change risks and opportunities (CC/ Climate Change), greenhouse gas emissions (GHG/ Green House Gas), energy consumption (EC/ Energy Consumption), greenhouse gas reduction and costs (RC/ Reduction and Cost) and carbon emission accountability (AEC/ Accountability of Emission Carbon). Within these five main categories, there are 18 items used to identify the extent of information disclosure related to climate change and carbon emissions.

RESULTS AND DISCUSSION

Logistic Regression Test

Logistic regression is an approach to creating predictive models, similar to linear regression, commonly known as Ordinary Least Squares (OLS) regression. The difference is that in logistic regression, researchers predict the dependent variable (Y) on a dichotomous scale. The dichotomous scale refers to a nominal data scale with two categories. This study uses logistic regression because the dependent variable is business sustainability, using dummy variables that use the numbers 0 (zero) and 1 (one).

Analysis of Regression Model Feasibility Test

The feasibility of the regression model was assessed using Hosmer and Lomeshow's Goodness of Fit Test. The hypothesis for assessing the feasibility of the regression model:

H0: There is no difference between the model and the data

Ha: there is a difference between the model and the data

If the value of the Hosmer and Lomeshow's Goodness of Fit Test statistic is equal to or less than 0.05, then the null hypothesis is rejected, meaning there is a significant difference between the model and its observed values

, so the Goodness of fit model is not good because the model cannot predict its observed values.

Conversely, if it is not significant, the Null hypothesis cannot be rejected, meaning the empirical data is the same as the model or the model is said to fit. The results of the study using the SPSS version 20 program obtained the following output:

Table 2 Hosmer and Lemeshow Test

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	3,394	8	,907

Source: SPSS Output Results, 2025

Table 2 shows that the Hosmer and Lemeshow's Goodness of Fit Test value is 3.394 and a significance level of 0.907 . This significance level is greater than 0.05, indicating that the model is able to predict the observed values, or it can be said that the model is acceptable because it fits the observed data.

Overall Model Test Analysis

The overall assessment of the model is done by comparing the value between -2 Log Likelihood (-2LL) at the beginning (Block Number = 0), where the model only includes a constant with the value of -2 Log Likelihood (-2LL) at the end (Block Number = 1), where the model includes a constant and independent variables.

Table 3 Overall fit model test

-2 Log Likelihood	
-2 Initial Log Likelihood (Block Number = 0)	84.54
-2 Final Log Likelihood (Block Number = 1)	52 . 795

Source: SPSS Output Results, 2025

The table above shows that the -2 Log Likelihood (-2LL) value is used in logistic regression analysis to assess the extent to which the model fits the data. The smaller the -2LL value , the better the model is in explaining the relationship between the independent and dependent variables. In the results obtained, the initial -2 Log Likelihood (Block 0) was 84.5454 , the final -2 Log Likelihood (Block 1) decreased to 52.795 , indicating an increase in the model's fit to the data. This decrease in the -2LL value indicates that the logistic regression model used is better able to explain the relationship between the variables analyzed compared to the initial model.

Nagelkerke Test Analysis (R²)

The Nagelkerke R Square is a modification of the Cox and Snell coefficients to ensure that its value varies between 0 and 1. This test is conducted to assess how much variation in the dependent variable (business sustainability) can be explained by variations in the independent variables (environmental performance and financial performance). The Nagelkerke R² value can be interpreted like the R² value in multiple regression .

Table 4 Nagelkerke (R² Model Summary)

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	41,878 ^a	,347	,609
a. Estimation terminated at iteration number 9 because parameter estimates changed by less than .001.			

Source: SPSS Output Results, 2025

Table 4 shows the Cox & Snell R Square value of 0.347 and Nagelkerke R Square of 0.609 indicating how much the independent variables in the model can explain the dependent variable. The Nagelkerke R Square value is higher than the Cox & Snell R Square. shows that the model is able to explain approximately 60.9% of the variation in the dependent variable, while the remaining 39.1% is influenced by other factors outside the model.

Classification Table

The classification table shows the predictive power of the regression model to predict the probability of occurrence of the dependent variable. The predictive power of the regression model to predict the probability of occurrence of the dependent variable is expressed as a percentage.

Table 5 Classification Table

Classification Table ^a					
Observed			Predicted		
			Business Sustainability		Percent age Correct
			,00	1.00	
Step 1	Sustainability Business	,00	9	6	60.0
		1.00	5	80	94.1
	Overall Percentage				89.0
a. The cut-off value is 0.500					

Source: SPSS Output Results, 2025

The classification table shows the predictive power of the regression model in predicting the probability of business sustainability resulting from the company. The classification results show that the model used has a fairly good predictive ability overall with an accuracy level of 89.0%. This model predicts two categories in the business sustainability variable, namely class 0 (not sustainable) and class 1 (sustainable). From the observation results, the model was able to classify 80 of 85 cases of the sustainable class correctly, resulting in

an accuracy level of 94.1% for that class. However, for the unsustainable class, only 9 of 15 cases were correctly classified, resulting in a lower accuracy of 60.0%. This indicates that the model is more effective in recognizing sustainable businesses compared to those that are not.

Logistic Regression Model Formed and Hypothesis Testing

A logistic regression model can be formed by looking at the estimated parameter values in Variables in The Equation . The regression model formed based on the estimated parameter values in Variables in The Equation in 2011 is as follows:

Table 6 Logistic Regression Test

No	Variables	Variable Y	Grade B	Sig.
1	Environmental Performance	Business Sustainability	2,367	0.001
2	Financial performance	Business Sustainability	0.159	0.014

Source: SPSS Output Results, 2025

Table 6 shows the logistic regression equation in this study as follows:

$$Y = -7.475 + 2.367X_1 + 0.159X_2 + e$$

Information :

Y = Business Sustainability

α = Constant

β = regression coefficient

X₁ = Environmental Performance

X₂ = Financial performance

e = Error term

The logistic regression equation can be explained as follows:

The environmental constant and financial performance) are zero, then business sustainability will decrease by - 7.475. With a significance value (Sig.) of 0.002, this constant has a significant role in the logistic regression model.

The Environmental Performance B value of 2.367 indicates that every one unit increase in the environmental performance variable will increase business sustainability by 2.367.

The Financial Performance B value of 0.159 indicates that every one unit increase in the financial performance variable will increase business sustainability by 0.159.

The interpretation of the results of the proposed hypothesis tests H1 and H2 can be presented as follows:

Environmental performance has a positive and significant impact on business sustainability

Based on table 4.7, it can be seen that the environmental performance variable has a significance value (Sig.) of 0.001, this result indicates that the relationship is statistically significant because it is below the 0.05 limit. In addition, the B coefficient is 2.367. This means that environmental performance (X1) has a positive and significant effect on business sustainability (Y) in other words, **H1 is accepted**. Therefore, the first hypothesis stating that environmental performance has a positive and significant effect on business sustainability is proven.

Financial performance has a positive and significant impact on business sustainability

Based on table 6, it can be seen that the financial performance variable has a significance value (Sig.) of 0.014, this relationship is also statistically significant, because it is smaller than 0.05. With a B value of 0.159. This means that financial performance (X2) has a positive and significant effect on business sustainability (Y) in other words, **H2 is accepted**. Therefore, the hypothesis that financial performance has a positive and significant effect on business sustainability is proven.

Results of the Moderating Regression Test with the Absolute Difference Value Approach

The potential of moderating variables in increasing or decreasing the impact of independent variables on dependent variables is tested using moderated regression analysis.

Table 7 Absolute Assumption Test

No	Variables Predictor	Variable Y	Grade B	Sig.
1	Environmental Performance	Business Sustainability	– 11,448	0.083
2	Financial performance	Business Sustainability	0.367	0.489
3	Disclosure Carbon Emissions	Business Sustainability	– 76,912	0.036
4	X1 M	Business Sustainability	22,969	0.048
5	X2 M	Business Sustainability	–0.227	0.772

Source: SPSS Output Results, 2025

Table 7 shows the logistic regression equation in this study as follows:

$$Y = 38,690 - 11,448X_1 + 0.367X_2 - 76.912X_3 + 22.969X_1X_3 - 0.227X_2X_3 + e$$

Information :

Y : Corporate Sustainability

a : Constant

β_1 : Regression coefficient X1

β_2 : Regression coefficient X_2

X_1 : Environmental Performance

X_2 : Financial Performance

X_3 : Carbon Emission Disclosure

X_1X_3 : Carbon Emission (interaction of variables X_1 and X_3)

X_2X_3 : Carbon Emission (interaction of variables X_2 and X_3)

e : Standard Error

The constant value of B is 38.690, indicating that when all independent variables have a value of zero, the business sustainability is 3.550.

Environmental Performance The B value of -11.448 indicates that environmental performance has a negative relationship with the dependent variable, meaning that increasing environmental performance actually reduces business sustainability.

The Financial Performance B value of 0.367 indicates that every one unit increase in the financial performance variable will increase business sustainability by 0.367.

The B value of Carbon Emission Disclosure of -76.912 indicates that every one unit increase in the carbon emission variable will reduce financial performance by -76.912.

The B value of the interaction between environmental performance and carbon emission disclosure of 22.969 shows that the interaction between environmental performance and carbon emission disclosure will increase business sustainability by 22.969.

The B value of the interaction between financial performance and carbon emission disclosure of -0.227 indicates that the interaction between financial performance and carbon emission disclosure will reduce business sustainability by -0.227.

The interpretation of the results of the proposed hypothesis tests H3 and H4 can be presented as follows:

Carbon Emission Disclosure can moderate the influence of environmental performance on business sustainability.

Based on table 4.8, it can be seen that the moderating variable, namely X_1 M, has a sig. value of 0.048, with a B value of 22.969, this means that carbon emission disclosure strengthens the influence of environmental performance on business sustainability or **H3 is accepted**. Therefore, the third hypothesis which states that carbon emission disclosure moderates the influence of environmental performance on business sustainability is proven.

Carbon Emission Disclosure cannot moderate the influence of Financial Performance on Business Sustainability

Based on table 4.8, it can be seen that the moderating variable, namely X_2 M, has a sig. value of 0.772. With a B value of -0.227, this means that carbon emission disclosure cannot moderate the effect of environmental performance on business sustainability or **H4 is rejected**. Therefore, the fourth hypothesis stating that carbon emission disclosure can moderate the effect of financial performance on business sustainability is not proven.

DISCUSSION OF RESEARCH RESULTS

Environmental Performance Has a Positive and Significant Impact on Business Sustainability

The relationship between environmental performance and business sustainability is gaining increasing attention in business practice and academic research. Companies with strong environmental performance demonstrate their ability to effectively manage their operational impacts on the environment, such as through emissions reduction, energy efficiency, waste management, and compliance with environmental regulations. This performance not only reflects a company's social responsibility but also serves as an important indicator for maintaining good relationships with the community, government, investors, and other stakeholders.

The results of the study show a B value of Environmental Performance of 2.438, indicating that increased environmental performance is positively related to an increase in the likelihood of an event occurring in the dependent variable. With a significance value (Sig.) of 0.001, this result indicates that the relationship is statistically significant because it is below the 0.05 limit. This means that environmental performance has a positive and significant effect on business sustainability, in other words, H1 is accepted.

This research is in line with the legitimacy theory which identifies that the purpose of social responsibility expressed by companies is to gain legitimacy from the operational environment, maximize long-term financial strength, and be able to create harmony with public perception. This theory is also related to social disclosure which implies that the reason why companies disclose their environmental activities is something that is needed by the community in which the company operates, and failure to disclose can have detrimental implications for the company. Therefore, companies that have more concern for the surrounding environment will be considered to have a good image in the eyes of the community [26] .

This study reveals that environmental performance has a positive and significant impact on business sustainability. Companies that implement environmentally friendly practices tend to reap long-term benefits, including operational efficiency, regulatory compliance, and improved reputation among stakeholders. Implementing a sound environmental strategy can mitigate legal and financial risks resulting from regulatory violations, while also creating new opportunities in a market increasingly concerned with sustainability issues. These findings align with several previous studies, such as the study by Kartina.

If a company's performance is not well-reviewed, it will face pressure and encouragement from stakeholders to improve its environmental performance. A good environmental performance assessment can be used to inform the public through annual reports and sustainability reports about the company's environmental performance. This information is useful for investors when considering investment decisions (Fortuna and Putra, 2020).

Financial Performance Has a Positive and Significant Impact on Business Sustainability

Based on the research results, it can be concluded that financial performance has a positive and significant effect on business sustainability. The B value for Financial Performance of **0.159** indicates that financial performance is also positively related to the dependent variable, although with a smaller impact than environmental performance. With a significance value (Sig.) of **0.014**, this relationship is also statistically significant, because it is smaller than 0.05. This means that financial performance has a positive and significant effect on business sustainability, in other words, **H2 is accepted** .

In line with the Stakeholder theory first pioneered by Freeman (1984), Stakeholder theory explains that companies have relationships with stakeholders who directly influence each other (between the company and stakeholders) through the company's actions. This theory aims to have a strong bond between the company and its stakeholders, so that sustainable success is achieved [18] .

Stakeholder theory emphasizes that corporate operations do not only work to meet financial goals, but must also provide benefits to stakeholders to maintain operations carried out by organizations [27] . As a form of corporate responsibility towards society and other stakeholders , companies are often involved in corporate social responsibility activities. Society and stakeholders can provide a positive response to companies involved

in corporate social responsibility activities.

The research results show that financial performance has a positive and significant impact on business sustainability. Companies with strong financial performance, reflected in high profitability, adequate liquidity, and controlled debt management, have greater opportunities.

The positive response given by the community and stakeholders in the form of trust and acceptance of products produced by the company, as a result, can improve the company's operations, and this will have implications for increasing the company's financial performance. In line with Mastut's research) which revealed that the results of hypothesis testing showed that financial performance has a positive and significant influence on business sustainability. In line with research [29] which states that financial performance has a positive and significant influence on the company's sustainable capabilities.

Carbon Emission Disclosure Can Moderate the Impact of Environmental Performance on Business Sustainability

Based on the research results, it can be concluded that carbon emission disclosure can moderate the influence of environmental performance on business sustainability. The B value of the interaction between environmental performance and carbon emission disclosure of **22.969** indicates that the interaction between environmental performance and carbon emission disclosure will increase business sustainability by 18.323. The sig. value of **0.048** means that carbon emission disclosure strengthens the influence of environmental performance on business sustainability or **H3 is accepted**.

The underlying theory of legitimacy is the "social contract" that exists between a company and the community in which the company operates and uses economic resources. This contract states that the company will report its social activities in order to gain recognition and acceptance from the community [30]. By having a good image towards the environment in the eyes of the community, the company can be seen as helping the sustainability of the business, where the community feels confident that the company's existence does not harm the community or the environment. In this way, the company will reap good results because the community does not reject the company's existence by implementing programs that prioritize sustainable development.

With clear disclosure, companies can enhance their credibility and accountability, thereby attracting more sustainability-minded investors and strengthening relationships with customers and business partners. Furthermore, disclosing carbon emissions contributes to compliance with increasingly stringent environmental regulations, reducing legal and financial risks that could hinder business continuity. Therefore, transparency in carbon emissions disclosure not only reflects a company's commitment to environmentally friendly business practices but also reinforces the positive impact of environmental performance on long-term business sustainability.

Carbon Emission Disclosure Cannot Moderate the Impact of Financial Performance on Business Sustainability

Based on the research results, it can be concluded that carbon emissions cannot moderate the influence of financial performance on business sustainability. The B value of the interaction between financial performance and carbon emission disclosure of **-0.227** indicates that the interaction between financial performance and carbon emission disclosure will reduce business sustainability by 0.370. The sig. value of **-0.227** means that carbon emission disclosure is unable to strengthen the influence of financial performance on business sustainability or H4 is rejected.

Disclosure of carbon emissions, such as revealing a company's responsibility for climate change-related actions and the actions it will take to address them, reflects the company's business ethics. This way, stakeholders will be able to understand the company's commitment to and concern for the environment, allowing them to collectively address the company's potential environmental impacts.

The results of this study indicate that carbon emission disclosure cannot moderate the effect of financial

performance on business sustainability. This means that the amount of carbon emissions produced by a company does not strengthen or weaken the relationship between financial performance and business sustainability. One of the main reasons is that business sustainability is often more influenced by other factors such as business strategy, environmental innovation, and government regulations, rather than simply the level of carbon emissions produced.

These results suggest that while carbon transparency is important for environmental legitimacy, a company's financial performance may be more influenced by operational efficiency and investment strategy than by the level of carbon disclosure. In the context of stakeholder theory, this suggests that investors still prioritize short-term financial performance over environmental sustainability, weakening the moderating effect of carbon emissions disclosure.

CONCLUSION

Environmental performance has a positive and significant impact on business sustainability. This demonstrates that companies that implement environmentally friendly practices have a greater chance of long-term survival. Environmental awareness can also help companies comply with regulations, improve operational efficiency, and build a positive reputation among stakeholders.

Financial performance has a positive and significant impact on business sustainability, although its impact is smaller than that of environmental performance. A positive public response to corporate social responsibility can also improve financial performance and support business sustainability.

Disclosure of carbon emissions can strengthen the influence of environmental performance on business sustainability. This means that companies with strong environmental performance and transparent disclosure of their carbon emissions are better able to maintain long-term business sustainability.

Carbon emissions disclosure fails to strengthen the influence of financial performance on business sustainability. This indicates that a company's disclosed carbon emissions levels do not directly moderate the relationship between financial performance and business sustainability.

The results of this study emphasize the importance for mining companies to strengthen their environmental management systems and expand transparent disclosure of carbon emissions. Management needs to integrate sustainability strategies into operational practices and reporting to gain social legitimacy and investor trust. Governments and regulators are advised to tighten carbon reporting policies and provide incentives for companies with superior environmental performance. Future research could expand the sample to other sectors such as energy, manufacturing, or services to compare sustainability levels across industries. Furthermore, cross-country or cross-time period comparative studies could be conducted to understand the dynamics of carbon disclosure in different economic contexts. Future researchers could also test other variables such as corporate governance or green innovation as additional moderating factors.

BIBLIOGRAPHY

1. K. Ramadhani, MS Saputra, and L. Wahyuni, "The effect of green accounting implementation and environmental performance on financial performance with corporate governance as a moderating variable," vol. 0832, no. September, pp. 227–242, 2022.
2. M. Apriliani and MW Abdullah, "Tanjidor Art Philosophy in the Implementation of Corporate Social Responsibility," J. Akunt. Multiparadigma , vol. 9, no. 2, pp. 377–393, 2018, doi: 10.18202/ jamal .2018.04.9023.
3. Idrawahyuni, Alimuddin, and & et al., "Essence of Environmental Accounting in," Essence of Environmental Accounting in Corporate Sustainability , vol. 3, no. November, pp. 147–159, 2020, doi: 10.35326/jiam.v3i2.
4. S. Muchlis and M. Mariyani, "Social Responsibility Accounting Sues Corporate Finances Reviewed from the Concept of Going Concern," JPS (Jurnal Perbank. Syariah) , vol. 2, no. 1, pp. 95–113, 2021, doi: 10.46367/jps.v2i1.299.

5. G. Das Prena and KW Diarsa, "The Influence of Financial Performance and Company Value on Business Sustainability (Going Concern) in Banking Companies on the Indonesia Stock Exchange (BEI)," vol. 14, no. 1, pp. 1–8, 2019.
6. ANF Fathia and S. Virna, "Ibn Sina University (UIS)," *REALIBLE Account. J.* , vol. 3, no. 1, pp. 1–12, 2023.
7. RI Adyaksana and BG Pronosokodewo, "Do Environmental Performance and Environmental Costs Influence Environmental Information Disclosure?," *InFestasi* , vol. 16, no. 2, pp. 157–165, 2020, doi: 10.21107/infestasi.v16i2.8544.
8. R. Brouwers, F. Schoubben, C. Van Hulle, S. Van Uytbergen, and K. Leuven, "The link between corporate environmental performance and corporate value: A literature review," *Rev. Bus. Econ. Lit.* , vol. 58, no. 4, pp. 343–374, 2014, [Online]. Available: <https://lirias.kuleuven.be/1665413>
9. AM Gerged, E. Beddewela, and CJ Cowton, "Is corporate environmental disclosure associated with firm value? A multicountry study of Gulf Cooperation Council firms," *Bus. Strategy. Environ.* , vol. 30, no. 1, pp. 185–203, 2021, doi: 10.1002/bse.2616.
10. L. Judijanto, RE Arini, and P. Andiani, "The Role of Financial Performance Evaluation in the Context of Business Sustainability: A Bibliometric Analysis Review," vol. 03, no. 04, pp. 479–488, 2024.
11. NG Ronaldo and RRS Handayani, "The Effect of Sustainability Report Disclosure on the Financial Performance of Banking Companies in Indonesia," *Diponegoro J. Account.* , vol. 12, no. 4, pp. 1–14, 2023, [Online]. Available: <http://ejournal-s1.undip.ac.id/index.php/accounting>
12. K. Kirk, TL McClair, SP Dakouo, T. Abuya, and P. Sripad, "Introduction of digital reporting platform to integrate community-level data into health information systems is feasible and acceptable among various community health stakeholders: A mixed-methods pilot study in Mopti, Mali," *J. Glob. Health* , vol. 11, pp. 1–12, 2021, doi: 10.7189/jogh.11.07003.
13. N. Putry and N. Pangestu, "Evaluation of Company Financial Performance Based on Profitability Ratios at PT Bank BTPN Syariah (National Syariah Pension Savings Bank Tbk) Listed on the Indonesia Stock Exchange," vol. 4, no. 5, pp. 1086–1091, 2024.
14. M. Awliya, "Profitability Analysis (Return on Assets (ROA) and Return on Equity (ROE) at PT Sido Muncul Tbk (2015-2018 Period)," *J. Econ. Educ.* , vol. 1, no. 1, pp. 10–18, 2022.
15. CH Putri, T. Lestari, and N. Ritawaty, "The Effect of Return on Assets, Equity and Earning Per Share on Stock Prices in the Banking Sector on the Indonesia Stock Exchange," *Owner* , vol. 6, no. 2, pp. 2230–2240, 2022, doi: 10.33395/owner.v6i2.862.
16. K. Citra, Y. Faisal, C. Wibisono, and E. Gumala Sari, "The Effect of Capital Adequacy, Liquidity and Firm Size on Earnings Management With Corporate Governance As Moderating Variables in Conventional Banking Listed on Idx 2015 – 2019," *Cashflow Curr. Adv. Res. Shariah Financ. Econ. Worldw.* , vol. 1, no. 1, pp. 33–49, 2021, doi: 10.55047/cashflow.v1i1.20.
17. REE Freeman, "A Stakeholder Approach to Strategic Management," *SSRN Electron. J.* , no. January 2001, 1984, doi: 10.2139/ssrn.263511.
18. B. Parmar, S. de Colle, and jeffrey S. Harrison, "Stakeholder theory: The state of the art," *Stakehold. State Art Theory* , pp. 1–343, 2010, doi: 10.1017/CBO9780511815768.
19. K. Davis and R.L. Blomstrom, "Business and Its Environment," *Acad. Manag. J.* , vol. 11, no. 2, pp. 237–238, 1968, doi: 10.5465/amj.1968.4297423.
20. IC Ghozali, *Accounting Theory*, 3rd Edition . Diponegoro University, Semarang., 2013.
21. S. Bahri and FA Cahyani, "The influence of environmental performance on corporate financial performance with corporate social responsibility disclosure as an intervening variable (Empirical study on manufacturing companies listed on the IDX)," *Ekonika J. Ekon. Univ. Kadiri* , vol. 1, no. 2, 2016.
22. Fahmi, *Financial Performance Analysis* . Alfabeta: Bandung, 2011.
23. IB Suratno, D. Darsono, and S. Mutmainnah, "The Influence of Environmental Performance on Environmental Disclosure and Economic Performance (Empirical Study on Manufacturing Companies Listed on the IDX 2001-2004)," *Indones. Account. Res.* , vol. 10, no. 2, 2007, doi: <http://doi.org/10.33312/ijar.174>.
24. MI Rahmawati and A. Subardjo, "The effect of environmental disclosure and environmental performance on economic performance moderated by good corporate governance," *J. Bul. Stud.*

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- Ekon. , vol. 22, no. 2, pp. 200–226, 2017.
25. B.B. Choi, D. Lee, and J. Psaros, “An Analysis of Australian Company Carbon Emission Disclosures,” *Pacific Account. Rev.* , vol. 25, no. 1, pp. 58–79, 2013, doi: <https://doi.org/10.1108/01140581311318968>.
26. ER Amaliyah and D. Puspawati, “Implementation of Green Accounting on Environmental Performance (Case Study on Mining and Energy Companies Listed on the Indonesia Stock Exchange 2014-2020) Implementation of Green Accounting on Environmental Performance (Case Study on Companies,” pp. 191–200, 2022.
27. SW Hadiningtiyas and A. Mahmud, "Accounting Analysis Journal Determinant of Environmental Disclosure on Companies Listed in Indonesia Stock Exchange (IDX) Article History," *Aaj* , vol. 6, no. 3, pp. 380–393, 2017, [Online]. Available: <http://journal.unnes.ac.id/sju/index.php/aaj>
28. NM Mastuti and NLP Wiagustini, “THE ROLE OF SOCIAL CAPITAL AND REPUTATION CAPITAL IN FINANCIAL PERFORMANCE AND BUSINESS SUSTAINABILITY,” *Management Accounting, Econ.* , vol. 8, no. 11, 2024.
29. KO Saputri, “Financial performance on the company's sustainable capability,” vol. 11, no. 1, pp. 24–32, 2019.
30. Y. Mandaika and H. Salim, “The Effect of Company Size, Financial Performance, Industry Type, and Financial Leverage on Corporate Social Responsibility Disclosure: An Empirical Study of Manufacturing Companies Listed on the Indonesia Stock Exchange in 2011-2013,” *J. Accountant .* , vol. 8, no. 2, pp. 181–201, 2015, doi: 10.25170/jara.v8i2.18.