Journal of Social Knowledge Education (JSKE)
Vol. 7, No. 2, March 2026, pp. 116~126
ISSN: 2722-046X, DOI: 10.37251/jske.v7i2.2668

Sustainability Signaling and Firm Value: Carbon Emission Disclosure and Environmental Performance Ratings in Shaping Firm Value in Indonesia

Linda Dwi Puspita Sari[1], Syahriar Abdullah[2], Supartini[3], Susilaningtyas Budiana Kurniawati[4]
Department of Accounting, Faculty of Economics and Business, Tunas Pembangunan University, Central Java, Indonesia

Article Info

Article history:

Received Jan 14, 2026
Revised Feb 11, 2026
Accepted Mar 13, 2026
Online First Mar 20, 2026

Keywords:

Carbon emission disclosure
Environmental accounting
Firm value
Green economy
PROPER ratings

ABSTRACT

Purpose of the study: This study aims to analyze the effect of carbon emission disclosure and the environmental performance ratings of the corporate environmental performance rating program on firm value, both partially and simultaneously, in companies listed on the Indonesia Stock Exchange for the period 2022–2024.

Methodology: This study employs a quantitative causal-comparative approach using secondary data from corporate and regulatory disclosures. Carbon emission disclosure is treated as a form of corporate social accountability, reflecting firms' responses to environmental expectations. Firm value is measured using Tobin's Q, while environmental performance is represented by the environmental performance ratings, which function as a public policy instrument implemented by the Indonesian government. Statistical analysis is used to examine how public regulation shapes market responses to corporate environmental accountability.

Main Findings: The results indicate that carbon emission disclosure does not have a significant effect on firm value. The environmental performance have a negative and significant effect on firm value. Simultaneously, carbon emission disclosure and the environmental performance ratings do not have a significant effect on firm value, indicating that environmental information is not yet a major consideration for investors.

Novelty/Originality of this study: This study offers novelty by re-examining the effect of carbon emission disclosure and the environmental performance ratings on firm value using the most recent data from the 2022–2024 period. It assesses whether environmental aspects have been utilized by investors as signals in firm valuation and provides empirical contributions to environmental accounting literature and the formulation of sustainable business policies.

Corresponding Author:
Linda Dwi Puspita Sari,
Department of Accounting, Faculty of Economics and Business, Tunas Pembangunan University, Jl. Walanda Maramis No. 31, Cengklik, Surakarta, Central Java 57135, Indonesia
Email: lindadwipuspitasari618@gmail.com

1. INTRODUCTION

Climate change driven by increasing carbon emissions represents not only an environmental problem but also a global social issue with far-reaching implications for societal welfare, economic stability, and intergenerational equity [1]-[3]. The impacts of climate change are reflected in the rising frequency of environmental disasters, the deterioration of urban air quality, and mounting pressures on economic and social systems, particularly in developing countries that remain highly dependent on fossil fuel based industrial and energy sectors [4]-[7]. In this context, climate change cannot be understood merely as a technical or ecological

concern, but rather as a challenge of social governance that requires the active involvement of multiple actors, including governments, corporations, and society at large.

As major contributors to carbon emissions, corporations especially those operating in industrial and energy-intensive sectors occupy a strategic position as influential social actors in climate change mitigation efforts [8]-[10]. Corporate operational activities not only affect economic performance but also generate social and environmental consequences that are borne by the wider public. Consequently, the state intervenes through various environmental governance instruments as mechanisms of social control to ensure corporate accountability for the ecological impacts they produce [11]-[13]. In Indonesia, policy instruments such as the corporate environmental performance rating program, carbon taxation, and the establishment of the Indonesian Exchange Carbon reflect the government's efforts to steer corporate behavior toward more sustainable and socially responsible business practices [14]-[16].

Within the framework of environmental governance, corporate transparency and social accountability constitute key elements in balancing economic, environmental, and social interests [17], [18]. Carbon emission disclosure serves not merely as a technical reporting mechanism, but also as a form of social communication that enables the public, investors, and other stakeholders to assess corporate commitment to sustainability [19], [12]. Consistent with signaling theory, environmental information disclosed by firms can be interpreted as socio-economic signals that shape perceptions, trust, and market responses toward corporate behavior and long-term prospects [20].

Although prior studies have extensively examined the relationship between carbon emission disclosure, environmental performance ratings, and firm value, the findings remain mixed [14], [21]-[26]. Some studies report that environmental disclosure and the environmental performance ratings exert a positive influence on firm value [12], [27], while others document weak or insignificant effects [9], [21]. Moreover, much of the existing literature continues to frame this issue predominantly within accounting or financial perspectives, without explicitly situating it within the broader context of environmental governance, corporate social accountability, and the role of the state as a regulator particularly in developing countries such as Indonesia.

This study becomes increasingly relevant and urgent in light of the strengthening national climate policy framework and the growing market sensitivity to sustainability issues in recent years. Indonesia's commitment to achieving the Sustainable Development Goals particularly Sustainable Development Goals 12 (Responsible Consumption and Production) and Sustainable Development Goals 13 (Climate Action), as well as national development priorities articulated in the Asta Cita agenda, which emphasizes the transition toward a green and low carbon economy, its Net Zero Emissions 2060 target, and the reinforcement of policy instruments such as carbon taxation and carbon trading through Indonesian Exchange Carbon signal significant shifts in the country's environmental governance landscape [3], [28]-[33]. By employing recent data from the 2022–2024 period, this study offers empirical novelty by capturing market responses during the early stages of more stringent environmental policy implementation, while simultaneously extending the analytical perspective through the application of signaling theory within the context of environmental governance in a developing economy [20].

Based on the foregoing discussion, this study aims to analyze the effect of carbon emission disclosure and the environmental performance ratings on firm value among companies listed on the Indonesian Stock Exchange. This research is expected not only to contribute empirical evidence to the literature on sustainable accounting and finance, but also to enrich social science discourse on environmental governance, corporate social accountability, and the effectiveness of public policy in promoting sustainable business practices. Therefore, the research problem in this study is

H1: Carbon emission disclosure has a positive and significant effect on firm value

H2: The environmental performance ratings has a positive and significant effect on firm value

H3: Carbon emission disclosure and the environmental performance ratings simultaneously have a positive and significant effect on firm value

2. RESEARCH METHOD

2.1. Type and Research Design

This study employs a quantitative approach with a causal-comparative research design to examine the effect of carbon emission disclosure and environmental performance ratings, on firm value. A quantitative approach is adopted because it enables objective hypothesis testing using numerical data and statistical analysis, allowing the relationships between variables to be systematically identified and measured [34], [35]. The causal-comparative design is applied because this study investigates cause and effect relationships based on existing conditions without manipulating the independent variables. Carbon emission disclosure and the environmental performance ratings represent publicly available information that has already occurred, making an experimental approach impractical. This design is consistent with prior empirical studies examining the relationship between environmental disclosure, environmental performance, and firm value in capital market research [1], [2], [26], [8], [12], [27], [36]. Explaining research chronological, including research design, research procedure (in the form of

algorithms, Pseudocode or other), how to test and data acquisition [1]-[3]. The description of the course of research should be supported references, so the explanation can be accepted scientifically [2], [4].

2.2. Research Subject and Sample

The population of this study consisted of companies listed on the Indonesia Stock Exchange during the 2022–2024 period. Companies from various industrial sectors were selected based on the consideration that these sectors have a relatively high potential for carbon emissions and are therefore relevant for analysis in the context of carbon emission disclosure and environmental performance assessment [19], [27]. Furthermore, the inclusion of companies participating in the environmental ratings reflects the role of government based environmental rating systems in evaluating corporate environmental performance in Indonesia [13], [37].

The sampling technique applied in this study was purposive sampling, which allows researchers to select samples based on specific criteria relevant to the research objectives [35]. The criteria included companies that consistently participated in the corporate environmental performance rating program, published complete annual and sustainability reports, and provided complete data for all research variables during the observation period [9], [13]. Based on these criteria, the final sample consisted of 17 companies observed over three years, resulting in a total of 51 firm-year observations.

2.3. Data Type, Research Instrument and Data Collection Techniques

This study utilized secondary data obtained from publicly available sources. Data on carbon emission disclosure were collected from companies annual reports and sustainability reports. the environmental performance ratings were obtained from official publications of the Ministry of Environment and Forestry of the Republic of Indonesia, while financial data required to calculate firm value were sourced from the official website of the Indonesia Stock Exchange [11], [18], [23]. The use of secondary data is appropriate because all variables examined in this study are documented and published in official records [38].

Table 1. Data Type, Research Instrument and Data Collection Techniques

Variable	Data Type	Measurement/Instrument	Data Source	Collection Technique
Carbon Emission Disclosure	Secondary	Disclosure index based on annual and sustainability reports	Company annual & sustainability reports	Documentation
Environmental Performance Ratings	Secondary	Corporate Environmental Performance Rating Program score	Ministry of Environment and Forestry offical publication	Documentation
Firm Value	Secondary	Tobin's Q	Indonesia Stock Exchange website	Documentation

2.4. Variable Measurement

2.4.1. Carbon Emission Disclosure

Carbon emission disclosure refers to the extent to which a company transparently reports information related to greenhouse gas emissions resulting from its operational activities. In this study, carbon emission disclosure was measured using a disclosure index based on the Global Reporting Initiative 305 standards, which provide comprehensive guidelines for reporting emissions-related information [39]. The indicators used in this study include direct emissions (Scope 1), indirect emissions from energy consumption (Scope 2), other indirect emissions (Scope 3), greenhouse gas emission intensity, emission reduction initiatives, ozone-depleting substances emissions, and other significant air emissions such as nitrogen oxides and sulfur oxides. These indicators are widely applied in prior studies to assess the completeness of corporate carbon emission disclosure [19], [40]. Each disclosure indicator is assessed by assigning a score of 1 if the information is disclosed in the company's annual report or sustainability report, and a score of 0 if it is not disclosed. The carbon emission disclosure index is then calculated by dividing the total number of disclosed indicators by the total number of applicable indicators. The index ranges from 0 to 1, where values closer to 1 indicate a higher level of carbon emission disclosure [19].

2.4.2. The Environmental Performance Ratings

The environmental performance ratings is a government environmental performance evaluation program implemented by the Ministry of Environment and Forestry to assess corporate compliance and beyond-compliance environmental practices [18], [23]. The environmental performance ratings were converted into numerical scores to facilitate quantitative analysis, where gold was scored as 5, green as 4, blue as 3, red as 2, and black as 1. This conversion method has been widely applied in previous empirical studies examining environmental performance and firm value [21].

2.4.3. Firm Value

Firm value reflects market perceptions of a company's performance and future prospects, which are commonly represented by stock market indicators [27], [41]. In this study, firm value was measured using Tobin's Q, which is calculated as follows:

$$\text{Tobin's Q} = \frac{\text{Market Value of Equity} + \text{Book Value of Liabilities}}{\text{Book Value of Total Assets}}$$

Tobin's Q was selected because it provides a comprehensive measure of firm value by incorporating both market-based and accounting-based information, thereby offering a more holistic assessment of firm performance.

2.5. Data Analysis Technique

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS). The analysis procedures included descriptive statistical analysis to summarize the characteristics of the data, classical assumption tests to ensure the validity of the regression model, and multiple linear regression analysis to examine the effect of carbon emission disclosure and environmental performance ratings on firm value [41]. Hypothesis testing was performed using t-tests to assess partial effects and F-tests to examine simultaneous effects, with a significance level of 5 percent.

2.6. Research Procedure

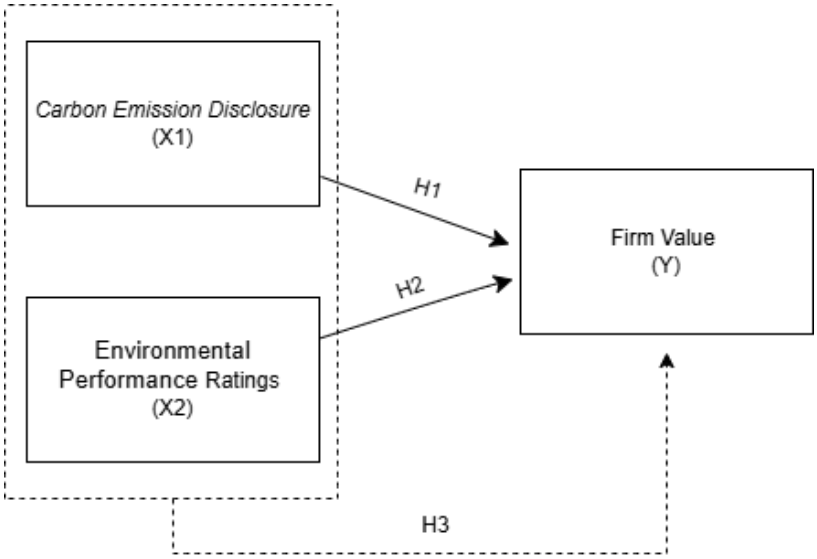

Figure 1. Research Data

This study was conducted through a systematic research procedure to test the partial effects of carbon emission disclosure (X1) and environmental performance ratings (X2) on firm value (Y), as well as their simultaneous effect on firm value. The procedure began with determining the population and selecting samples of companies listed on the Indonesia Stock Exchange that participated in the corporate environmental performance rating program during the 2022–2024 period. Secondary data were collected from annual reports, sustainability reports, the environmental performance ratings publications, and the official Indonesian Carbon Exchange website. Carbon emission disclosure was measured using a disclosure index, the environmental performance ratings were converted into numerical scores, and firm value was measured using Tobin's Q. The collected data were analyzed using descriptive statistics, classical assumption tests, and multiple linear regression analysis with Statistical Package for the Social Sciences software to examine both partial and simultaneous relationships among variables, as illustrated in the research flowchart.

3. RESULTS AND DISCUSSION

This section presents the results of data processing and empirical testing conducted to address the research objectives. The presentation of results aims to provide a comprehensive empirical overview of the characteristics

of the research data and to ensure that all statistical assumptions required for regression analysis are satisfied. Accordingly, all analytical procedures were carried out systematically and sequentially to confirm the suitability an d reliability of the research model [35].

The empirical analysis comprises descriptive statistical analysis, classical assumption testing, multiple linear regression analysis, and hypothesis testing. Descriptive statistics are employed to summarize the characteristics of the research variables. Classical assumption tests are conducted to ensure that the regression model satisfies the assumptions of normality, absence of multicollinearity, and heteroskedasticity. Furthermore, multiple linear regression analysis and hypothesis testing are performed to examine the effects of carbon emission disclosure and environmental performance, as measured by the environmental performance ratings, on firm value [35].

3.1. Descriptive Statistical Analysis

Descriptive statistical analysis is conducted to provide an overview of the characteristics of the research variables, including minimum values, maximum values, means, and standard deviations. Descriptive statistics summarize the fundamental characteristics of the variables examined in this study. Specifically, they report the minimum, maximum, mean, and standard deviation values to illustrate the central tendency and dispersion of carbon emission disclosure, environmental performance ratings, and firm value. This preliminary analysis provides an overview of the data distribution and ensures a better understanding of the dataset before conducting regression analysis.

Tabel 2. Descriptive Statistical Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
Firm Value	50	-.46	1.06	.134	.309
Carbon Emission Disclosure	50	.57	1.00	.882	.150
Environmental Performance Ratings	50	3.00	5.00	4.040	.807
Valid N (Listwise)	50				

Source: Data processed using SPSS Version 25

Based on the descriptive statistics, the study uses 50 valid observations after excluding one outlier from the initial 51 observations to improve data consistency. The carbon emission disclosure variable shows a minimum value of 0.57 and a maximum value of 1.00, with a mean of 0.882 and a standard deviation of 0.150. These results indicate that, on average, sample companies have disclosed carbon emission information at a relatively high and consistent level.

The environmental performance ratings variable ranges from 3.00 to 5.00, with a mean value of 4.040 and a standard deviation of 0.807. This suggests that most sample companies demonstrate good environmental performance, although there are variations in environmental ratings across firms. Meanwhile, firm value, which has been transformed into natural logarithmic form, shows a minimum value of −0.46 and a maximum value of 1.06, with a mean of 0.134 and a standard deviation of 0.309. This indicates considerable variation in firm value among the sampled companies. Overall, the descriptive statistics indicate that the data are well distributed and suitable for further regression analysis.

From a social perspective, the relatively high average level of carbon emission disclosure indicates that firms have attempted to present themselves as environmentally responsible entities. This effort reflects an intention to build social legitimacy through environmental transparency. However, the substantial variation in firm value suggests that the market has not uniformly interpreted environmental disclosure as a basis for investor trust.

3.2. Classical Assumption Test Results

The normality test is conducted to assess whether the regression residuals are normally distributed using the One-Sample Kolmogorov–Smirnov test on unstandardized residuals. The test results show an Asymp. Sig. (2-tailed) value of 0.050, which is equal to the significance threshold of 0.05. This result indicates that the residuals are normally distributed. Therefore, the normality assumption is satisfied, and the regression model is appropriate for further analysis.

The multicollinearity test is performed using Tolerance and Variance Inflation Factor (VIF) values to examine potential correlations among independent variables. The results show that both carbon emission disclosure and the environmental performance ratings have Tolerance values of 0.840 and VIF values of 1.190. Since all Tolerance values exceed 0.10 and all VIF values are below 10, it can be concluded that there is no multicollinearity among the independent variables. Thus, the regression model satisfies the multicollinearity assumption.

The heteroskedasticity test is conducted using the Glejser method by regressing absolute residuals on the independent variables. The results show significance values of 0.054 for carbon emission disclosure and 0.625 for the environmental performance ratings. Because all significance values exceed 0.05, it can be concluded that the

regression model does not exhibit heteroskedasticity. The residual variance is constant, and the homoskedasticity assumption is fulfilled.

3.3. Hypothesis Testing

Multiple linear regression analysis is a statistical method used to examine the relationship between one dependent variable and two or more independent variables. In this study, it is employed to analyze the effect of carbon emission disclosure and environmental performance ratings on firm value.

Tabel 3. Multiple Linear Regression Analysis Test Results

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.424	.286		1.484	.145
	Carbon Emission Disclosure	.227	.314	.110	.724	.473
	Environmental Performance Ratings	-.121	.058	-.317	-2.078	.043
Dependent Variable: LN_Firm Value						

Source: Data processed using SPSS Version 25

Based on the multiple linear regression analysis, this study examines the effect of carbon emission disclosure and the environmental performance ratings on firm value. The estimated regression model is expressed as follows:

$$\text{Firm Value} = 0.424 + 0.227\ \text{Carbon Emission Disclosure} - 0.121\ \text{Environmental Performance Ratings} + \varepsilon$$

The interpretation of the regression coefficients is as follows:

- The constant value of 0.424 indicates the level of firm value when all independent variables are held constant.
- Carbon emission disclosure has a positive regression coefficient of 0.227, indicating a positive relationship with firm value.
- The environmental performance ratings has a negative regression coefficient of −0.121, indicating an inverse relationship with firm value.

The multiple linear regression results indicate that environmental signals conveyed through carbon emission disclosure and environmental performance ratings have not been fully responded to positively by the market. From a signaling theory perspective, this suggests that environmental information has not yet been perceived as a credible signal in shaping investor perceptions. Socially, this finding reflects the limited ability of firms to convert environmental legitimacy efforts into increased investor trust and firm value.

The partial test (t-test) is conducted to assess the statistical significance of each regression coefficient individually. This test evaluates whether each independent variable significantly affects the dependent variable, holding other variables constant within the multiple regression model.

Tabel 4. Partial Test (t-Test) Results

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.424	.286		1.484	.145
	Carbon Emission Disclosure	.227	.314	.110	.724	.473
	Environmental Performance Ratings	-.121	.058	-.317	-2.078	.043
Dependent Variable: LN_Firm Value						

a. Dependent Variable: LN_Firm Value

Source: Data processed using SPSS Version 25

The t-test is conducted to examine the partial effect of each independent variable on firm value. The results show that carbon emission disclosure has a significance value of 0.473 (> 0.05), indicating that carbon emission disclosure does not have a statistically significant effect on firm value. Therefore, H1 is rejected. Based on signaling theory, carbon emission disclosure is intended to serve as a positive signal to reduce information asymmetry between firms and investors. However, the insignificant result indicates that such environmental signals have not yet been perceived as credible by the market. Socially, this finding suggests that carbon disclosure has not been effective in strengthening corporate social legitimacy or enhancing investor trust.

In contrast, the environmental performance ratings variable shows a significance value of 0.043 (< 0.05) with a negative regression coefficient. This indicates that environmental performance ratings has a significant negative effect on firm value. Accordingly, H2 is accepted, although the direction of the relationship is negative and contrary to the initial expectation. The environmental performance ratings represent externally verified environmental signals provided by the government as a form of regulatory legitimacy. However, the negative effect on firm value suggests that investors may perceive higher environmental performance as a potential cost burden. Consequently, although the environmental performance enhances social legitimacy from a regulatory perspective, this signal has not yet been translated into increased investor confidence in the capital market.

The simultaneous test (F-test) is conducted to examine the overall significance of the regression model. This test determines whether all independent variables collectively have a statistically significant effect on the dependent variable. A significant F-statistic indicates that the model is suitable for explaining variations in the dependent variable.

Table 5. Simultaneous Test (F-Test) Results

Model		Sum of Squares	df	Mean Squares	F	Sig.
1	Regression	.395	2	.198	2.167	126[b]
	Residual	4.286	47	.091		
	Total	4.681	49			

a. Dependent Variable: LN_Firm Value
b. Predictors: (Constant), Environmental Performance Ratings, Carbon Emission Disclosure

Source: Data processed using SPSS Version 25

The F-test is conducted to examine the simultaneous effect of carbon emission disclosure and the environmental performance ratings on firm value. Based on the ANOVA results, the F-statistic value is 2.167 with a significance level of 0.126 (> 0.05). This result indicates that carbon emission disclosure and the environmental performance ratings do not simultaneously have a significant effect on firm value. Therefore, H3 is rejected, and the regression model does not demonstrate a significant joint explanatory effect. The absence of a simultaneous effect of carbon emission disclosure and the environmental performance ratings on firm value indicates that environmental signals, both voluntary and regulatory, have not yet functioned effectively in shaping market perceptions. Socially, this finding reflects a gap between state-driven environmental legitimacy, societal expectations of corporate responsibility, and investors short term financial orientation.

The coefficient of determination (Adjusted R Square) represents the proportion of variance in the dependent variable that is explained by the independent variables, while accounting for the number of predictors included in the model. Unlike the unadjusted R Square, the adjusted measure penalizes the inclusion of additional variables that do not substantially improve the model's explanatory power, thereby providing a more reliable assessment of model fit in multiple regression analysis.

Table 6. Coefficient of Determination (Adjusted R Square)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.291[a]	.084	.045	.30198

a. Predictors: (Constant), Environmental Performance Ratings, Carbon Emission Disclosure

Source: Data processed using SPSS Version 25

The coefficient of determination is used to measure the explanatory power of the regression model. The results show an Adjusted R Square value of 0.045. This indicates that carbon emission disclosure and the environmental performance ratings collectively explain only 4.5% of the variation in firm value, while the remaining 95.5% is influenced by other factors outside the scope of this study. Consequently, the explanatory power of the model is considered relatively weak. The relatively low coefficient of determination suggests that investor trust is still predominantly influenced by non environmental factors, reinforcing the notion that environmental signals have not yet become a primary reference in firm valuation.

This subsection discusses the empirical findings by linking the results of statistical testing with signaling theory and relevant prior studies. The discussion is organized according to each formulated hypothesis to provide a systematic interpretation of the findings.

The empirical results indicate that carbon emission disclosure is positively associated with firm value, although the relationship is not statistically significant, leading to the rejection of the first hypothesis. This finding suggests that, within the Indonesian capital market, carbon-related environmental information has not yet become a decisive factor in investors' valuation processes. Investors appear to continue prioritizing conventional financial indicators over non-financial environmental disclosures. This pattern is consistent with prior empirical evidence showing that environmental disclosure has not been fully incorporated into market assessments of firm value [2],

[18], [21]. Accordingly, carbon emission disclosure remains a relatively weak market signal in influencing firm valuation. From a social legitimacy perspective, carbon emission disclosure represents a voluntary corporate effort to meet societal and regulatory expectations regarding environmental responsibility [12]. However, in the context of a developing country such as Indonesia, voluntary disclosure practices that are not yet reinforced by strong regulatory mechanisms limit the internalization of social legitimacy into investor confidence and market valuation [16]. This condition reflects a misalignment in the state market society nexus, where regulatory pressures and social demands for environmental accountability are not fully translated into economic value in the capital market.

From a signaling theory and environmental governance perspective, carbon emission disclosure functions as a voluntary non-financial signal aimed at reducing information asymmetry between management and investors [20]. Nevertheless, the insignificant result indicates that the signal has not been perceived as credible or economically relevant by the market. This underscores the importance of linking environmental disclosure with regulatory frameworks, such as the environmental performance ratings, carbon taxation, and the Indonesian Exchange Carbon [16]. Theoretically, these findings contribute to social science literature by illustrating how corporate environmental behavior is influenced not only by market incentives but also by social expectations and regulatory oversight, highlighting the interplay between the state, market, and society [42]. Practically, the results carry implications for investors and the public, emphasizing that voluntary disclosure alone is insufficient to influence market decisions.

The results indicate that the environmental performance ratings has a statistically significant negative effect on firm value, thereby supporting the second hypothesis with a negative direction. This finding suggests that higher levels of environmental performance, as reflected the environmental performance ratings, are associated with lower firm valuation in the market. One possible explanation is that improved environmental compliance may be perceived as increasing operational and compliance costs, which can place downward pressure on short-term profitability and, consequently, firm value. This interpretation is consistent with prior empirical evidence indicating that environmental performance and regulatory compliance costs may be negatively valued by the market [10], [43]. From a signaling theory perspective, the environmental performance ratings functions as a credible external signal issued by the government, representing not only environmental performance but also social legitimacy and regulatory compliance [6], [44]. Nevertheless, in the context of developing countries such as Indonesia, the negative market response suggests that investors interpret higher the environmental performance ratings primarily as cost signals rather than value-enhancing indicators, highlighting a tension between social–environmental objectives and short-term financial perceptions [12].

From a social governance and policy perspective, this finding underscores the complex interplay among the state, market, and society in shaping corporate environmental behavior [45], [21]. While the environmental performance ratings aim to guide firms toward sustainable practices, the market's negative response suggests that social legitimacy and regulatory signals have not yet been fully internalized as economic value by investors. Theoretically, these results contribute to social science literature by demonstrating how regulatory instruments and ranking-based environmental policies influence corporate behavior beyond traditional financial incentives, emphasizing the state's role in social governance [44]. Practically, this finding has implications for policymakers to strengthen and communicate the benefits of the environmental performance ratings more effectively, and for investors and society to recognize long term value associated with environmental stewardship [12].

The simultaneous test results indicate that carbon emission disclosure and the environmental performance ratings do not jointly affect firm value, resulting in the rejection of H3. This finding suggests that both internal (carbon emission disclosure) and external (the environmental performance ratings) environmental signals are not yet sufficiently strong to influence investor perceptions in the Indonesian capital market [20]. From a legitimacy theory perspective, these results imply that the social and regulatory legitimacy of environmental performance has not fully translated into economic value, reflecting a gap in corporate adherence to societal and governmental expectations [37], [16]. In the context of developing countries, where environmental disclosure remains largely voluntary and regulatory mechanisms are still evolving, the role of the state as a social regulator is crucial for shaping corporate behavior [14], [30]. The low Adjusted R Square further indicates that firm value is predominantly influenced by conventional financial factors rather than environmental considerations, highlighting the secondary position of sustainability in investor decision-making over a short-term horizon [27], [42].

These findings contribute theoretically to social science literature by linking environmental governance, corporate social accountability, and market behavior within the state market society nexus [20], [16]. For public policy, strengthening the program and integrating ranking based environmental regulations could enhance the credibility of environmental signals, aligning corporate actions with societal expectations[37], [15]. Socially, investors and communities benefit from improved transparency and regulatory oversight, which can foster trust and informed decision-making [12], [27]. However, this study is limited by its focus on Indonesian listed firms and a short observation period (2022–2024), which may not capture long term responses to environmental governance [29]. Future research could explore comparative environmental governance studies across developing countries, investigate the longitudinal impact of ranking-based policies, and examine how regulatory enforcement affects corporate social responsibility and investor perceptions [16].

The findings of this study indicate that carbon emission disclosure does not have a significant effect on firm value. This finding is consistent with previous studies suggesting that environmental disclosure does not always generate a direct market response. This may indicate that investors do not fully incorporate carbon disclosure information into their valuation decisions. In contrast, environmental performance ratings show a significant negative effect on firm value, suggesting that higher environmental performance may be associated with additional compliance costs perceived by the market. Simultaneously, both variables collectively influence firm value, indicating that environmental governance mechanisms play a role in shaping market perceptions within the Indonesian context.

This study contributes to the literature by providing empirical evidence on the role of carbon emission disclosure and environmental performance ratings as sustainability signals influencing firm value in Indonesia. The findings enrich signaling theory by showing that environmental signals are not always positively interpreted by the market. However, this study is limited by its short observation period, restricted sample of rated and listed companies, and reliance on secondary data. Future research is recommended to extend the observation period and include additional variables for broader generalization.

4. CONCLUSION

Based on the results and discussion, it can be concluded that carbon emission disclosure does not have a significant effect on firm value, while the environmental performance ratings has a significant negative effect. Furthermore, the simultaneous test indicates that both variables do not jointly influence firm value. These findings suggest that, within the context of the Indonesian capital market, environmental information both internal signals in the form of carbon emission disclosure and external signals in the form of environmental performance ratings has not yet been fully perceived as economically value-relevant by investors. From a signaling theory perspective, this indicates that environmental signals remain weaker than financial signals in shaping investor decisions, particularly in short-term investment horizons.

Despite its contributions, this study has several limitations that should be considered when interpreting the findings. First, the presence of extreme values (outliers) in some of the research variables required the exclusion of certain observations to ensure that the regression model met classical assumption requirements. As a result, the final sample size was reduced, which may affect the generalizability of the results. Second, to address non-normal data distribution, firm value was transformed using the natural logarithm (LN). While this transformation improved the robustness of the statistical analysis, it also implies that firm value is no longer expressed in its original scale. Accordingly, the interpretation of the findings should be understood as reflecting relationships based on adjusted, logarithmic values.

Looking forward, the results of this study provide opportunities for further research by incorporating additional explanatory variables, extending the observation period, and expanding the research sample across different industries. Future research may build on this study by examining environmental disclosure within wider institutional and regulatory settings. In particular, attention could be directed to how differences in regulatory enforcement, public oversight, and levels of investor awareness shape the extent to which environmental information is interpreted not merely as symbolic compliance but as a credible signal in the capital market. In addition, further studies may consider the social and political dynamics through which disclosure standards, rating mechanisms, and state-led policy instruments acquire legitimacy and, in turn, affect firm valuation, especially in emerging market contexts.

ACKNOWLEDGEMENTS

The author would like to express sincere appreciation to all parties who have provide support, insight, and assistance throughout the research process, enabling this study to be completed successfully.

REFERENCES

[1] N. Ahmad, “Peran Peringkat Proper dan Biaya Lingkungan Terhadap Nilai Perusahaan BUMN di Indonesia,” vol. 9, no. 3, pp. 10–19, 2021.
[2] W. Anggita, A. A. Nugroho, and Suhaidar, “Carbon emission disclosure and green accounting practices on firm value,” vol. 26, no. 3, pp. 464–481, 2022.
[3] United Nations, “The 17 Goals,” *sdgs.un.org*. [Online]. Available: https://sdgs.un.org/goals
[4] CNN Indonesia, “Emisi karbon meningkat lagi di 2024, dampaknya ngeri,” *cnnindonesia.com*. [Online]. Available:https://www.cnnindonesia.com/teknologi/20241119100723-641-1168158/emisi-karbon-meningkat-lagi-di-2024-dampaknya-ngeri
[5] CNN Indonesia, “Suhu naik 1,75 derajat Celsius, Januari 2025 cetak rekor panas,” *cnnindonesia.com*. [Online]. Available: https://www.cnnindonesia.com/teknologi/20250210094344-641-1196422/suhu-naik-175-derajat-celsius-januari-2025-cetak-rekor-panas
[6] Kementerian Lingkungan Hidup/Badan Pengendalian Lingkungan Hidup, “Jabodetabek alarm polusi: KLH/BPLH bergerak serentak, tak ada ruang bagi pencemar udara,” *kemenlh.go.id*. [Online]. Available:

https://kemenlh.go.id/news/detail/jabodetabek-alarm-polusi-klhbplh-bergerak-serentak-tak-ada-ruang-bagi-pencemar-udara
[7] D. Herlambang, "BMKG: 2024 jadi tahun terpanas sepanjang sejarah, perubahan iklim kian membahayakan kesehatan publik," *bmkg.go.id*. [Online]. Available: https://www.bmkg.go.id/siaran-pers/bmkg-2024-jadi-tahun-terpanas-sepanjang-sejarah-perubahan-iklim-kian-membahayakan-kesehatan-publik
[8] N. Avelyn and E. Syofyan, "Pengaruh ukuran perusahaan, kinerja lingkungan, dan voluntary disclosure terhadap nilai perusahaan," vol. 5, no. 1, pp. 214–232, 2023.
[9] R. I. Bahriansyah and Y. L. Ginting, "Pengungkapan emisi karbon terhadap nilai perusahaan dengan media exposure sebagai variabel moderasi," vol. 9, no. 2, 2022.
[10] Belinda and V. Sulfitri, "Pengaruh akuntansi hijau, kinerja lingkungan, inovasi hijau, tanggung jawab sosial perusahaan dan pengungkapan emisi karbon terhadap nilai perusahaan," vol. 4, no. 2, pp. 2554–2572, 2025.
[11] W. D. Alfayerds and M. A. Setiawan, "Pengaruh pengungkapan emisi karbon dan annual report readability terhadap nilai perusahaan," *Jurnal Eksplorasi Akuntansi*, vol. 3, no. 2, pp. 349–363, 2021.
[12] M. Hardiyansah, A. T. Agustini, and I. Purnamawati, "The effect of carbon emission disclosure on firm value: Environmental performance and industrial type," vol. 8, no. 1, pp. 123–133, 2021, doi: 10.13106/jafeb.2021.vol8.no1.123.
[13] Kementerian Lingkungan Hidup dan Kehutanan, "Kriteria PROPER," *proper.menlhk.go.id*. [Online]. Available: https://proper.menlhk.go.id/proper/kriteria
[14] Bursa Efek Indonesia, "Peluncuran Bursa Karbon Indonesia (IDXCarbon)," *idx.co.id*. [Online]. Available: https://www.idx.co.id/id/berita/berita/b882a251-3e5c-ee11-b808-005056aec3a4
[15] Y. Kurniawan, "Pajak karbon sebagai solusi menuju era berkelanjutan bangsa," *pajak.go.id*, Nov. 12, 2025. Available:https://www.pajak.go.id/id/artikel/pajak-karbon-sebagai-solusi-menuju-era-berkelanjutan-bangsa
[16] A. C. Sudjono and A. Setiawan, "Peran regulasi keuangan berkelanjutan terhadap tingkat kesiapan wajib pajak dalam penerapan pajak karbon di Indonesia," *Jurnal Bisnis dan Akuntansi*, vol. 24, no. 2, pp. 365–380, 2022, doi: 10.34208/jba.v24i2.1514.
[17] D. Damas, R. El Maghviroh, and M. Indreswari, "Pengaruh eco-efficiency, green innovation dan carbon emission disclosure terhadap nilai perusahaan," vol. 8, no. 2, pp. 85–108, 2021.
[18] A. C. Dianti and W. P. Sari, "Pengaruh pengungkapan emisi karbon, kinerja lingkungan, eco-efficiency, dan green innovation terhadap nilai perusahaan," vol. 4, pp. 8779–8792, 2024.
[19] B. B. Choi, D. Lee, and J. Psaros, "An analysis of Australian company carbon emission disclosures," *Pacific Accounting Review*, vol. 25, no. 1, pp. 58–79, 2013, doi: 10.1108/01140581311318968.
[20] M. Spence, "Job market signaling," *Quarterly Journal of Economics*, vol. 87, no. 3, pp. 355–374, 1973.
[21] H. N. Kristy and I. B. K. Bhayangkara, "Pengaruh environmental performance dan pengungkapan akuntansi karbon terhadap nilai perusahaan," vol. 9, no. 1, pp. 1–12, 2024.
[22] S. A. Rahmanita, "Pengaruh carbon emission disclosure terhadap nilai perusahaan," vol. 6, no. 1, pp. 53–70, 2020.
[23] K. E. Ramdani and A. A. Nugraha, "Pengaruh pengungkapan emisi karbon dan kinerja lingkungan terhadap nilai perusahaan," vol. 4, no. 3, pp. 215–225, 2024.
[24] A. I. Paradilla, A. Eliza, and S. Y. Anita, "Pengaruh pengungkapan emisi karbon dan financial media exposure sebagai variabel moderasi," vol. 14, no. 2, pp. 167–187, 2025.
[25] N. Munif and Nikmah, "Pengaruh kepatuhan regulasi lingkungan, profitabilitas, umur perusahaan terhadap pengungkapan emisi karbon," vol. 8, no. 1, 2025.
[26] B. Audika and N. N. Maushufi, "Pengungkapan emisi karbon, akuntansi hijau, dan kinerja lingkungan sebagai penentu nilai perusahaan," vol. 7, no. 1, pp. 47–60, 2024.
[27] P. Kurnia, D. P. E. Nur, and A. A. Putra, "Carbon emission disclosure and firm value: A study of manufacturing firms in Indonesia and Australia," 2021, doi: 10.32479/ijeep.10730.
[28] M. Madyan, "Analisis pengungkapan emisi karbon perusahaan Indonesia," *unair.ac.id*, Nov. 10, 2025. [Online]. Available: https://unair.ac.id/analisis-pengungkapan-emisi-karbon-perusahaan-indonesia/
[29] F. D. Muliawati, "Target penurunan emisi karbon naik jadi 400 ribu ton di 2025," *cnbcindonesia.com*, Sep. 20, 2025. [Online]. Available: https://www.cnbcindonesia.com/news/20250527190219-4-636756/target-penurunan-emisi-karbon-naik-jadi-400-ribu-ton-di-2025
[30] A. Oktariyani, "Analisis pengungkapan emisi karbon perusahaan dalam laporan tahunan dan keberlanjutan subsektor transportasi," vol. 2, no. 2, pp. 487–500, 2024.
[31] Rumah Kolaborasi dan Konsultasi Iklim dan Karbon, "Komitmen dalam NDC," *karbon.ditjenppi.org*. [Online]. Available: https://karbon.ditjenppi.org/faq-iklim-dan-karbon/komitmen-dalam-ndc
[32] K. Wisnubroto, "Tantangan besar, asta cita, dan keberlanjutan pembangunan," *indonesia.go.id*, Nov. 12, 2025. [Online]. Available: https://indonesia.go.id/kategori/editorial/8747/tantangan-besar-asta-cita-dan-keberlanjutan-pembangunan
[33] R. Sidauruk, "Industri hijau: Katalisator pencapaian net zero emission 2060," *antaranews.com*, Jan. 11, 2026. [Online]. Available: https://www.antaranews.com/berita/4877449/industri-hijau-katalisator-pencapaian-net-zero-emission-2060
[34] B. Nugraha, *Pengembangan Uji Statistik: Implementasi Metode Regresi Linier Berganda dengan Pertimbangan Uji Asumsi Klasik*. Penerbit Pradina Pustaka, 2022.
[35] B. Sudaryana and H. R. R. Agusiady, *Metodologi Penelitian Kuantitatif*. Yogyakarta: Deepublish, 2022.
[36] W. S. Yuliandhari, R. S. Saraswati, and Z. M. R. Safari, "Pengaruh carbon emission disclosure, eco-efficiency dan green innovation terhadap nilai perusahaan," *Owner*, vol. 7, no. 2, pp. 1526–1539, 2023, doi: 10.33395/owner.v7i2.1301.
[37] Kementerian Lingkungan Hidup dan Kehutanan, "PROPER," *proper.menlhk.go.id*. [Online]. Available: https://proper.menlhk.go.id/proper/
[38] U. Rahardja, Sudaryono, and M. H. R. Chakim, *Statistik Deskriptif: Teori, Rumus, Kasus untuk Penelitian*. Tangerang: APITIKOM, 2023.

[39] GRI Standards, "GRI 305: Emissions," 2016.
[40] Ikatan Akuntan Indonesia, "Carbon emission disclosure," *iaijawatimur.or.id*, Nov. 02, 2025. [Online]. Available: https://iaijawatimur.or.id/course/interest/detail/73
[41] A. Prasetyo, I. E. Maryanti, and S. Abdullah, "Pengaruh leverage, ukuran perusahaan, price earning ratio, dan liabilitas terhadap nilai perusahaan," *Jurnal Akuntansi Tunas Pembangunan*, pp. 52–65, 2023.
[42] M. Ulum, R. Agriyanto, and Warno, "Pengaruh pengungkapan emisi gas rumah kaca terhadap nilai perusahaan dengan biaya lingkungan sebagai variabel moderasi," pp. 155–167, 2020.
[43] M. A. F. Zakiyya and B. T. Rahmanto, "Pengaruh kinerja keuangan, kinerja lingkungan, dan pertumbuhan perusahaan terhadap nilai perusahaan sektor tambang tahun 2018–2022," vol. 1, no. 4, pp. 457–464, 2024.
[44] K. P. Sari and B. Susanto, "Green strategy, corporate social responsibility disclosure, good corporate governance terhadap pengungkapan emisi karbon," pp. 642–657, 2021.
[45] E. Taufiq and S. Pratiwi, "Pengaruh carbon management accounting dan pengungkapan lingkungan pada perusahaan pertambangan yang terdaftar di Bursa Efek Indonesia," 2022.