Mediating Role of Carbon Emissions Disclosure in the Relationship between Environmental Performance and Firm Value

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ABSTRACT

This research investigates the empirical relationship between environmental performance and firm value, with carbon emissions disclosure serving as a mediating variable. The study encompasses all companies listed on the IDX that participated in the PROPER program during 2021-2022. Using a non-probability sampling method, we obtained a sample of 150 companies. Data analysis was conducted using the causal step technique. The findings indicate that environmental performance positively impacts firm value and carbon emissions disclosure. Additionally, carbon emissions disclosure itself positively influences firm value and mediates the effect of environmental performance on firm value.

Keywords: Firm Value; Environmental Performance; Carbon Emissions Disclosure; Profitability; Firm Size

Pengungkapan Emisi Gas Rumah Kaca Memediasi Pengaruh Kinerja Lingkungan terhadap Nilai Perusahaan

ABSTRAK

Tujuan penelitian adalah memperoleh bukti empiris pengungkapan emisi gas rumah kaca memediasi pengaruh kinerja lingkungan terhadap nilai perusahaan. Penelitian dilakukan pada seluruh perusahaan yang terdaftar di BEI dan mengikuti Program PROPER tahun 2021-2022. Metode penentuan sampel adalah nonprobability sampling dengan sampel perusahaan sejumlah 150. Teknik analisis data yang digunakan adalah uji kausal step. Hasil penelitian adalah kinerja lingkungan berpengaruh positif terhadap nilai perusahaan, kinerja lingkungan berpengaruh positif terhadap pengungkapan emisi gas rumah kaca, pengungkapan emisi gas rumah kaca berpengaruh positif terhadap nilai perusahaan, dan pengungkapan emisi gas rumah kaca mampu memediasi pengaruh kinerja lingkungan terhadap nilai perusahaan.

Kata Kunci: Nilai Perusahaan; Kinerja Lingkungan; Pengungkapan Emisi Gas Rumah Kaca; Profitabilitas; Ukuran Perusahaan

Artikel dapat diakses : https://ejournal1.unud.ac.id/index.php/Akuntansi/index

e-ISSN 2302-8556

Vol. 35 No. 11
Denpasar, 30 November 2025
Hal. 2207-2216

DOI:
10.24843/EJA.2025.v35.i11.p09

PENGUTIPAN:
Putri, N. K. P. J., & Wirakusuma, M. G. (2025). Mediating Role of Carbon Emissions Disclosure in the Relationship between Environmental Performance and Firm Value. *E-Jurnal Akuntansi*, 35(11), 2207-2216

RIWAYAT ARTIKEL:
Artikel Masuk:
3 Januari 2025
Artikel Diterima:
6 Maret 2025

INTRODUCTION

Indonesia has experienced a significant annual increase in the number of investors across various asset classes, including the stock market, capital markets, and mutual funds. Investors often assess a company's firm value when making investment decisions. According to K. H. V. Sari & Budiasih (2022), a company's value reflects its current condition, with high values indicating favorable conditions and low values suggesting adverse conditions. Wirawati et al. (2020) propose that environmental factors can influence firm value. This is attributed to the enhancement of community legitimacy when a company prioritizes environmental concerns, societal standards, and normative practices (Anggraeni, 2015). Such prioritization is believed to increase firm value by garnering full stakeholder support.

Empirical studies on the impact of environmental performance on firm value have produced mixed results. Research by Fauzi (2022), Anqi & San (2022), and Nazwa & Fitri (2022) indicates a positive impact of environmental performance on firm value. In contrast, findings by Pramitha & Sudana (2021), Khansa & Prasetyo (2022), and M. K. Putri & Susanti (2023) suggest otherwise.

Studies by Lee & Cho (2021), Sari & Sulfitri (2023), and Giannarakis et al. (2017) reveal that environmental performance significantly and positively influences carbon emissions disclosure. To address the conflicting findings in empirical research, recent studies have included carbon emissions disclosure as a mediating variable between environmental performance and firm value. Research by Astuti et al. (2023), Han et al. (2023), and Kurnia et al. (2021) demonstrates that carbon emissions disclosure positively and significantly affects firm value. This study uniquely incorporates carbon emissions disclosure as a mediating variable.

To mitigate bias, this research controls for profitability and firm size, ensuring the dependent variable is not influenced by external factors impacting the independent variable. The inclusion of profitability as a control variable is based on the premise that investors are likely to value a firm higher if it earns substantial profits (Adnyani & Suaryana, 2020). Firm size is used as a control variable under the assumption that larger firms, with more total assets, are perceived positively by investors, leading to higher firm values. This is also based on the belief that larger companies typically have better asset management practices, which contribute to increased firm value (Adnyani & Suaryana, 2020).

According to stakeholder theory and legitimacy theory, businesses engage in environmental management initiatives to gain community support and favorable stakeholder opinions (Mardiana & Wuryani, 2019). Over time, investors recognize the value of these environmental efforts and are more likely to invest in the company, thereby increasing its worth. Notable studies, including those by Nazwa & Fitri (2022), Anqi & San (2022), and Rusmana & Purnaman (2020), have found that environmental performance positively affects firm value.

H_1: Environmental performance positively affects firm value.

Businesses that are environmentally conscious and have a high PROPER rating are more likely to disclose information about their carbon emissions to demonstrate the effectiveness of their environmental initiatives (Selviana & Ratmono, 2019). A high PROPER rating encourages full disclosure, which is why companies with stellar ratings frequently report their carbon emissions.

Environmentally responsible businesses voluntarily disclose more carbon emissions (Lee & Cho, 2021). Previous research by Lee & Cho (2021), Sari & Sulfitri (2023), and Ika et al. (2024) has shown that environmental performance positively affects carbon emissions disclosure (GHG).

H_2: Environmental performance positively affects carbon emissions disclosure (GHG).

Companies that disclose their carbon emissions demonstrate environmental responsibility, which is well-received by investors and helps assess the company's sustainability (Hardiyansah et al., 2021). When a company is transparent about its carbon emissions and is perceived as eco-conscious, its value increases. Conversely, if the company fails to do this, investors will view it positively and consider investing. Studies by Sari & Budiasih (2022), Astuti et al. (2023),and Hardiyansah et al. (2021) have shown that disclosing a company's carbon emissions increases its worth.

H_3: Carbon emissions disclosure (GHG) positively affects firm value.

Legitimacy theory posits that a company's reputation improves when it takes environmental sustainability seriously. Trust in the company's ability to uphold social obligations enhances its legitimacy within the community. Environmentally conscious businesses will be transparent with stakeholders about their carbon emissions. Since investors prefer firms with fewer environmental liabilities and a positive image, this transparency is expected to improve the firm's value. Previous studies, such as those by Sari & Sulfitri (2023), Ika et al. (2024), and Giannarakis et al. (2017), have found that environmental performance positively affects carbon emissions disclosure. Additionally, research by Sari & Budiasih (2022), Rusmana & Purnaman (2020), and Astuti et al. (2023)indicates that carbon emissions disclosure positively impacts firm value.

H_4: Carbon emissions disclosure (GHG) mediates the effect of environmental performance on firm value.

RESEARCH METHOD

The research population consists of 1,592 firms listed on the IDX and included in the 2021–2022 PROPER program. The data is quantitative, sourced from secondary sources, and includes information such as the number of outstanding shares, assets, liabilities (both current and long-term), stock market price, net profit after taxes, GHG disclosure value, and PROPER rating. A total of 150 observation samples were collected using a nonprobability sampling method based on purposive sampling methodology.

The research variables include firm value (dependent variable), environmental performance (independent variable), carbon emission disclosure/GHG (mediating variable), and profitability and firm size (control variables).

In accordance with studies by Gabrielle & Toly (2019), Rusmana & Purnaman (2020), and Kurnia et al. (2021),the following indicator is used in the computation of company value: the Tobin's Q ratio.

Tobin's Q = $\frac{MVE+Book\ Value\ of\ Debt}{Total\ Assets}$……………………………………………...……..…(1)

Where:

MVE	= total shares outstanding x stock market price
Book value of debt	= total of debt
Total assets	= total of assets

Environmental performance is measured using the results of the PROPER rating, which is symbolized by five colors (gold, green, blue, red, and black) and has scores of 5, 4, 3, 2, and 1.

Carbon emissions disclosure is measured by GRI standards indicators, specifically GRI 305 as a checklist item consisting of 7 indicators of carbon emissions disclosure (GHG). The weighting formula for this index is:

GHG = $\frac{Total\ score\ of\ company's\ carbon\ emissions\ disclosure}{Total\ maximum\ score}\ x\ 100\%$…………………...(2)

The indicator to measure profitability is ROA with the formula:

ROA = $\frac{Earning\ after\ tax}{Total\ assets}$……………..……………………………...…………………(3)

The measurement of the company size variable is:

Company size = ln (Total Assets)…….…………………………………….…………(4)

The causal step test is used as a data analysis technique with the equation model:

Model I: $Y = \alpha + \beta_1X_1 + \beta_4X_2 + \beta_5X_3 + \varepsilon_1$…………………….……………………..……...(5)

Model II: $M= \alpha + \beta_2X_1 + \varepsilon_2$…………………………………..…...………………..…(6)

Model III: $Y = \alpha + \beta_1X_1 + \beta_3M + \beta_4X_2 + \beta_5X_3 + \varepsilon_3$………………………………..…..…(7)

Where:

X_1	= Environmental performance
X_2	= Profitabilitity
X_3	= Company size
M	= Carbon emissions disclosure
Y	= Firm value
β1, β2, β3, β4, β5	= Regression coefficient of variable
ε	= error

RESULT AND DISCUSSION

Table 1 displays the descriptive statistical test findings, while Tables 2, 3, and 4 present the results obtained through the causal step test. Prior to conducting these tests, classic assumption tests were performed. These tests confirmed that the data met the assumptions of normality and showed no signs of multicollinearity, autocorrelation, or heteroscedasticity.

As shown in Table 1, the value of the company ranges between 0.530 and 2.830, with an average of 1.293 and a standard deviation of 0.576. Environmental performance has a value range of 2 to 5, an average of 3.360, and a standard deviation of 0.753. Carbon emission disclosures range from 0.140 to 1.000, with an average of 0.657 and a standard deviation of 0.243. Profitability varies from 0.005 to 0.180, with an average of 0.076 and a standard deviation of 0.422. Company size ranges from 26.790 to 33.660, with an average of 30.096 and a standard deviation of 1.551.

Table 1 Descriptive Statistic Test

Variable	N	Min.	Max.	Mean	Std. Deviation
Firm Value	150	0.530	2.830	1.293	0.576
Environmental Performance	150	2.000	5.000	3.360	0.753
Carbon Emissions Disclosure	150	0.140	1.000	0.657	0.243
Profitability	150	0.005	0.180	0.076	0.422
Company Size	150	26.790	33.660	30.096	1.551
Valid N (listwise)	150				

Source: Research Data, 2024

According to the coefficient of determination in Model I (R^2 = 0.359), environmental performance, profitability, and business size explain 35.9% of the variance in firm value. Model II indicates that 27.5% of the variance in carbon emissions disclosure is explained by environmental performance (R^2 = 0.275). In Model III, environmental performance, carbon emissions disclosure, profitability, and firm size collectively account for 38.5% of the variance in firm value (R^2 = 0.385).

Table 2 Analysis Causal Step Model I

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig..
		B	Std. Error	Beta		
1	(Constant)	1.651	0.558		2.956	0.004
	Environmental Performance	0.163	0.040	0.391	4.046	0.000
	Profitability	4,525	0,662	0,458	6,832	0,000
	Company Size	-0,079	0,020	-0,294	-4,018	0,000

a. Constant: Firm Value
b. R^2: 0,359

Source: Research Data, 2024

Referring to table 2, the model is:

$$Y = 1,651 + 0,163X_1 + 4,525X_2 +- 0,079X_3 + \varepsilon_1$$

The significance level of environmental performance is 0.000, which is below the 0.05 threshold. This result supports the first hypothesis (H1) and is corroborated by the research of Nazwa & Fitri (2022), Wahidahwati & Ardini (2021), Anqi & San (2022), Indriastuti & Chariri (2021), Fauzi (2022), Gabrielle & Toly (2019), Rusmana & Purnaman (2020), Rismayanti & Putri (2021), Rahmanita (2020), Wirawati et al. (2020), and Suniantari & Yasa (2022). These findings lend credence to legitimacy theory and stakeholder theory, both of which underpin this research.

Table 3 Analysis Causal Step Model II

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig..
1	(Constant)	0.088	0.078		1.124	0.263
	Environmental Performance	0.169	0.023	0.524	7.493	0.000

a. Constant: Carbon Emissions Disclosure
b. R^2: 0,275

Source: Research Data, 2024

Referring to table 3, the model is:

$M= 0,088 + 0,169X_1 + \varepsilon_2$

The significance level of environmental performance is 0.000, indicating that the value is below the 0.05 threshold. As a result, the second hypothesis (H2) is accepted, supported by the research of Yanto et al. (2019), Prasetya & Yulianto (2018), Widianto & Sari (2020), Setiawan & Iswati (2019), Yanto et al. (2017), Listyaningsih & Natalina (2020), Giannarakis et al. (2017), Jannah & Narsa (2020), Lee & Cho (2021), Sari & Sulfitri (2023), Ika et al. (2024), Prafitri & Zulaikha (2016), Krisnawanto & Solikhah (2019), and Putri et al. (2020) Putri et al. (2020). These consistent conclusions affirm that legitimacy theory and stakeholder theory provide a solid theoretical foundation for this investigation.

Table 4 Analysis Causal Step Model III

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig..
1	(Constant)	1.880	0.556		3.380	0.001
	Environmental Performance	0.114	0.044	0.206	2.569	0.011
	Carbon Emissions Disclosure	0.344	0.137	0.201	2.505	0.013
	Profitability	4.051	0.678	0.410	5.977	0.000
	Company Size	-0.087	0.020	-0.0326	-4.458	0.000

a. Constant: Firm Value
b. R^2: 0,385

Source: Research Data, 2024

Referring to table 4, the model is:

$Y = 1,880 + 0,114X_1 + 0,344M + 4,051X_2 – 0,087X_3 + \varepsilon_3$……………………………….(8)

The significance level of environmental performance is 0.011, which is below the 0.05 threshold. This result supports the third hypothesis (H3), corroborated by research from Lee & Cho (2021), Han et al. (2023), Mardiana & Wuryani (2019), Sari & Budiasih (2022), Hardiyansah et al. (2021), Gabrielle & Toly (2019), Anggraeni (2015), Rahmanita (2020), Kurnia et al. (2021), Astuti et al. (2023), and Rusmana & Purnaman (2020). These findings affirm that legitimacy theory and stakeholder theory provide a solid theoretical foundation for this investigation.

Table 2 shows a significance level of 0.000 for environmental performance, while Table 4 indicates a level of 0.011 when including the mediation variable. Both values are below 0.05, suggesting that environmental performance significantly influences firm value, indicating partial mediation. Consequently, we accept the fourth hypothesis (H4). These results further support legitimacy theory and stakeholder theory.

Legitimacy theory posits that corporations are more likely to report their carbon emissions if their environmental performance is above average. It also suggests that corporations can gain public legitimacy by disclosing their carbon emissions (Hardiyansah et al., 2021). Stakeholder theory views business initiatives aimed at improving environmental performance as a form of stakeholder responsibility. To gain a positive reputation among stakeholders, a corporation with good environmental performance will disclose its carbon emissions as fully as possible. Organizations that are transparent about their carbon emissions demonstrate genuine concern for the environment and take responsibility for their community and surroundings, enhancing their reputation. Consequently, increased investor interest will lead to a rise in the firm's value.

CONCLUSION

The study's findings lead to the following conclusions: firm value is positively and significantly influenced by environmental performance; GHG disclosure is positively and significantly affected by environmental performance; firm value is positively and significantly impacted by carbon emissions disclosure; and carbon emissions disclosure mediates the relationship between environmental performance and firm value. Companies with strong environmental performance are more likely to be transparent about their carbon emissions. Achieving public legitimacy and building a positive organizational image are crucial for maintaining strong stakeholder interactions. Consequently, increased investor interest will lead to a rise in the firm's value. These findings support stakeholder theory and legitimacy theory. The study's limitations include the period studied and the exclusion of medium and lower-tier companies. Future research could extend the study period to 5-10 years to provide more diverse research variations. Additionally, including medium and lower-tier companies as research samples is recommended. Future researchers might also consider replacing the mediating variables or adding new variables to introduce novelty to their research.

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