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Research Article

The Effect of Environmental Performance, Profitability, and Institutional Ownership on Carbon Emission Disclosure

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Abstract: Climate change driven by global warming has prompted companies to enhance transparency regarding the environmental impacts of their operational activities, particularly in the disclosure of carbon emissions. Such disclosure is essential to address stakeholder demands and to gain social legitimacy, in accordance with stakeholder theory, which serves as the foundation of this study. This research aims to empirically examine the effect of environmental performance, profitability, and institutional ownership on carbon emission disclosure among non-financial companies listed on the Indonesia Stock Exchange. The population of this study comprises non-financial companies listed on the Indonesia Stock Exchange from 2020 to 2023. The sample was selected using a purposive sampling technique, resulting in 332 observations from 115 companies. The data analysis method employed is multiple linear regression analysis. The results reveal that environmental performance has a positive effect on carbon emission disclosure, indicating that the better the company's environmental performance, the higher the level of carbon emission disclosure. Profitability and institutional ownership, however, have no significant effect on carbon emission disclosure.

Keywords: Carbon Emission Disclosure; Climate Change; Environmental Performance; Profitability; Institutional Ownership.

1. INTRODUCTION

Issues related to climate change caused by global warming have driven the adoption of new environmental policies in recent years (Astiti & Wirama, 2020). In response to these issues, companies are expected to pay greater attention to carbon emission disclosure. This disclosure represents a form of corporate social and moral responsibility to reduce carbon emissions and address public pressure regarding the environmental impact of operational activities that produce significant emissions (Dewayani & Ratnadi, 2021). Carbon emission disclosure plays a vital role in building, maintaining, and legitimizing a company's contribution from both economic and political perspectives, where companies can manage their carbon emissions through carbon accounting. This process involves calculating emissions from industrial activities, setting reduction targets, implementing reporting systems, and developing carbon reduction initiatives (Kurnia et al., 2020).

At the international level, the world has responded to the threat of climate change through a convention organized by the United Nations (UN), namely the United Nations Framework Convention on Climate Change (UNFCCC). One of the key outcomes of this convention was the adoption of the Kyoto Protocol in 1997, an international agreement establishing mechanisms to reduce greenhouse gas emissions in order to protect the Earth's climate system (United Nations Framework Convention on Climate Change, 2008). Indonesia ratified the first phase of the Kyoto Protocol on June 28, 2004, committing to participate in the global effort to reduce greenhouse gas emissions through the enactment of Law No. 17 of 2004. Furthermore, Indonesia signed the Paris Agreement in 2015 alongside 196 other countries, marking its commitment to reduce emissions and restore environmental damage (Muhammad & Aryani, 2021). This agreement signifies Indonesia's target to reduce carbon emissions by 29% by 2030.

Carbon emission disclosure has a legal basis in Law No. 40 of 2007 on Limited Liability Companies, Article 66c, which mandates the inclusion of social and environmental responsibility in annual reports. This obligation was strengthened by the issuance of a regulation by the Financial Services Authority (OJK) through POJK No. 51/POJK.03/2017

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concerning the Implementation of Sustainable Finance for Financial Institutions, Issuers, and Public Companies. This policy requires these entities to publish sustainability reports containing economic, financial, social, and environmental performance as part of sustainable business practices. Public companies were required to publish sustainability reports beginning in 2020, including environmental metrics such as the volume of emissions generated. This aligns with the Global Reporting Initiative (GRI) Standards, which recommend that companies operating in environmentally sensitive sectors fully disclose their carbon emissions (Kuswanto, 2019).

Indonesia has shown progress in corporate carbon emission reporting. According to a 2022 study by GRI ASEAN in collaboration with the Centre for Governance and Sustainability, National University of Singapore (NUS) Business School, Indonesia ranked second among six ASEAN countries examined, with an average score of 53.8% on the "performance" topic related to carbon emission disclosure. Thailand ranked first with an average score of 59.4% (GRI ASEAN, 2022). The study analyzed the completeness of climate-related reporting by the 100 largest companies in Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam based on market capitalization. The assessment covered seven key aspects: reporting framework, materiality, risks and opportunities, governance, strategy, targets, and performance in their sustainability reports.

Despite progress in carbon emission disclosure within sustainability reports, Indonesia's carbon emission levels remain very high. In 2022, Indonesia was among the world's top 10 carbon-emitting countries, with total emissions reaching 729 million tons annually—an increase of 18.3%, the highest rise among the observed countries. This surge was driven by heavy reliance on fossil fuels, particularly coal, and by land-use changes and deforestation (Global Carbon Project, 2022).

National greenhouse gas (GHG) emissions data from 2000–2022 indicate that, in 2022, the energy sector contributed 59% of total emissions, followed by forestry and other land use (18%), waste (11%), agriculture (7%), and industrial processes and product use (IPPU) (5%). Energy-related emissions represent the primary source of carbon emissions. This is due to the energy-intensive nature of operations in various non-financial sectors such as transportation, basic and chemical industries, miscellaneous industries, and mining. These data suggest that numerous sectors, especially non-financial companies, are responsible for high levels of carbon emissions. Therefore, companies must adopt meaningful actions, including disclosing their carbon emissions (Source: Ministry of Environment and Forestry, 2023).

Given this context, disclosing carbon emissions in corporate sustainability reports is crucial, as it reflects a company's commitment not only to profit but also to environmental and social concerns. The Global Reporting Initiative (GRI) actively contributes to shaping standards and initiatives related to sustainability reporting. This enables companies to transparently disclose their carbon emissions and encourages them to take tangible actions to protect the environment. By prioritizing high-quality carbon emission disclosure in sustainability reports, companies can meaningfully contribute to reducing carbon emissions in Indonesia.

Carbon emission disclosure in sustainability reports can also be seen as both a form of social responsibility and a strategic move to enhance corporate image. This is done to gain attention and support from various stakeholders. According to stakeholder theory, companies do not operate solely for their own interests but must also deliver value to all stakeholders. The theory suggests that companies should report relevant information to various interested parties. In response to stakeholder expectations, companies must communicate social and environmental issues, including carbon emission disclosure (Kılıç & Kuzey, 2019). Corporate continuity in operations is highly dependent on stakeholder support. Stakeholder theory asserts that companies must maintain good relationships with stakeholders by addressing their needs, as stakeholders control access to essential resources such as labor, natural resources, and markets.

Carbon emission disclosure is closely tied to a company's environmental performance (Maulidiavitasari & Yanthi, 2021). Environmental performance refers to the implementation of environmental management systems aimed at preserving the environment. Companies with strong environmental performance are more likely to engage in carbon emission disclosure to gain legitimacy (Dewayani & Ratnadi, 2021). These companies often adopt proactive strategies to address environmental issues, including carbon footprint measurement and management, as a response to their carbon emissions. They seek to highlight their environmental efforts through voluntary disclosures that are difficult for poorly performing

companies to imitate (Apriliana, 2019). Previous studies by Saptiwi (2019), Probosari & Kawedar (2019), and Maulidiavitasari & Yanthi (2021) have confirmed the effect of environmental performance on carbon emission disclosure.

In addition to environmental performance, profitability is another important factor influencing carbon emission disclosure (Tana & Bernadetta, 2021). Profitability refers to a company's ability to generate earnings from its operations. Companies with high profitability tend to have greater awareness and capability to disclose environmental information. They can leverage their assets to support sustainability initiatives, such as adopting environmentally friendly technologies and funding carbon disclosure efforts (Apriliana, 2019). Firms with higher profitability and carbon control capabilities are more confident in voluntarily disclosing emissions in their sustainability reports (Hapsoro & Falih, 2020). Studies by Resya et al. (2021), Darus et al. (2020), Yusuf (2021), Tana & Diana (2021), and Zahra & Aryati (2023) found a significant positive effect of profitability on carbon emission disclosure.

Institutional ownership may also influence carbon emission disclosure. Institutional ownership refers to shares held by institutions such as insurance companies, banks, and other entities (Aini et al., 2022). Institutional investors often act as monitors of corporate behavior. The greater the level of institutional ownership, the stronger the external influence on corporate governance (Andriani & Sudana, 2023). Large shareholdings by institutional investors provide them with the authority to exert control and encourage more optimal oversight of corporate governance (Mahadewi & Budiasih, 2023). Akbaş and Canikli (2019) argue that institutional investors are increasingly aware of climate change and its implications for shareholder value and managerial accountability. Studies by Akbaş & Canikli (2019), Amaliyah & Solikhah (2019), Solikhah et al. (2021), Almuaromah & Wahyono (2022), Salsabilla et al. (2024), and Angelina & Handoko (2023) all indicate a positive effect of institutional ownership on carbon emission disclosure.

This study also introduces two control variables in examining the factors that influence carbon emission disclosure: firm size and firm age. Firm size is generally measured by total assets, total revenue, or market capitalization (Septriyawati & Anisah, 2019), and in this study, is proxied by the natural logarithm of total assets (Widiastutik & Khafid, 2021). Larger companies face greater pressure from external parties to disclose emissions, as they tend to have broader operations and greater environmental impacts. These companies are thus more likely to respond to stakeholder demands and adopt carbon disclosure as a legitimacy strategy (Pratiwi et al., 2021; Ratmono et al., 2021). Prior research by Kholmi et al. (2020), Widiastutik & Khafid (2021), Dewayani & Ratnadi (2021), and Sekarini & Setiadi (2022) confirms the positive effect of firm size on carbon emission disclosure.

Firm age, or the length of time a company has been operating, is also relevant (Hadya & Fernandes, 2020). Older firms tend to have greater experience, a broader social network, and better stakeholder trust. Thus, they are more likely to provide comprehensive disclosures, including on carbon emissions, to maintain legitimacy. Studies by Setiawan & Iswati (2019), Ambarwati & Hapsoro (2020), Solikhah et al. (2021), and Aryni et al. (2021) have shown a positive effect of firm age on carbon emission disclosure.

This study builds upon Dewayani & Ratnadi's (2021) prior research on the effect of environmental performance, firm size, and profitability on carbon emission disclosure. A key distinction lies in this study's use of GRI Standards 305 (effective since 2016) as the framework for measuring carbon emission disclosure in sustainability reports. This differs from earlier studies that employed the Carbon Disclosure Project index developed by Choi et al. (2013). GRI 305 offers a more comprehensive and up-to-date framework, including disclosures related to ozone-depleting substances, nitrogen oxides (NOx), sulfur oxides, and other air emissions, thereby enhancing corporate environmental transparency. The study covers the period 2020–2023, aligning with the mandatory implementation of sustainability reporting.

2. METHOD

This study employs a quantitative approach with a causal associative relationship to analyze the effect of environmental performance, profitability, and institutional ownership on carbon emission disclosure, with firm size and firm age as control variables. The research population consists of all non-financial sector companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2023 period. The sample was selected using a purposive sampling technique based on specific criteria, including companies that publish both annual and sustainability reports, have received a PROPER rating, do not experience financial losses, have institutional ownership, and disclose at least one item of carbon emissions.

The dependent variable in this study is carbon emission disclosure (CED), measured using an index based on the GRI 305: Emissions 2016 standard through content analysis. The independent variables include: environmental performance (ENVPERF), measured using the PROPER score (1–5); profitability (ROA), calculated from net income divided by total assets; and institutional ownership (INST), measured from the proportion of institutional shares to total outstanding shares. The control variables are firm size (SIZE), measured by the natural logarithm of total assets, and firm age (AGE), calculated as the difference between the observation year and the year the company was established.

Data were collected through non-participant observation of annual and sustainability reports obtained from the official website of the IDX and each company. The data analysis technique used is multiple linear regression with the assistance of SPSS. Before conducting the regression test, descriptive statistical testing and classical assumption tests (normality, multicollinearity, heteroscedasticity, and autocorrelation) were conducted. Model feasibility testing was carried out using the F-test, partial significance testing was conducted using the t-test, and the coefficient of determination (R^2) was used to evaluate the extent to which the independent variables explain the dependent variable.

3. RESULTS AND DISCUSSION

Description of Research Variable Data

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard Deviation
CED	332	0.050	0.595	0.222	0.139
ENVPERF	332	2	5	3.14	0.717
ROA	332	0.001	0.944	0.083	0.088
INS	332	0.002	0.999	0.771	0.253
SIZE	332	23,651	39,283	29,861	2,047
AGE	332	8	117	47.00	19,318
Valid N (listwise)	332				

Source: Processed data, 2025

Based on the results of descriptive statistical testing in Table 1, the following can be explained.

a) The carbon emission disclosure variable has a minimum value of 0.050, held by PT Asahimas Flat Glass Tbk. (AMFG), PT Kabelindo Murni Tbk. (KBLM), PT Akasha Wira International Tbk. (ADES), PT Multi Bintang Indonesia Tbk. (MLBI), PT Mayora Indah Tbk. (MYOR) in 2020; PT Asahimas Flat Glass Tbk. (AMFG), PT Kabelindo Murni Tbk. (KBLM), PT Campina Ice Cream Industry Tbk. (CAMP), PT Multi Bintang Indonesia Tbk. (MLBI), PT Mayora Indah Tbk. (MYOR) in 2021; PT Asahimas Flat Glass Tbk. (AMFG), PT Kabelindo Murni Tbk. (KBLM), PT Campina Ice Cream Industry Tbk. (CAMP), PT Siantar Top Tbk. (STTP), PT Garuda Metalindo Tbk. (BOLT) in 2023. The maximum value is 0.595, held by PT Perusahaan Gas Negara Tbk. (PGAS) in 2020; PT Perusahaan Gas Negara Tbk. (PGAS), PT Bukit Asam Tbk. (PTBA), PT Vale Indonesia Tbk. (INCO), Austindo Nusantara Jaya Tbk. (ANJT) in 2021; PT Perusahaan Gas Negara Tbk. (PGAS), PT Bukit Asam Tbk. (PTBA), PT Vale Indonesia Tbk. (INCO) in 2022; PT Adaro Energy Indonesia Tbk. (ADRO), PT Perusahaan Gas Negara Tbk. (PGAS), PT Bukit Asam Tbk. (PTBA) in 2023. The mean value is 0.222, indicating that, on average, companies disclose carbon emissions at 0.222 or around 8 out of 37 disclosure items, which tends to be closer to the minimum value. This shows that carbon emission disclosure by non-financial companies listed on the IDX is relatively poor. The standard deviation is 0.139, indicating that the deviation of carbon emission disclosure from its mean is 0.139, and since this is lower than the mean, the data distribution is relatively close.

b) The environmental performance variable has a minimum value of 2, held by PT Ifishdeco Tbk. (IFSH), PT Kabelindo Murni Tbk. (KMLM), PT Organon Pharma Indonesia Tbk. (SCPI), PT Intiland Development Tbk. (DILD) in 2020; PT Samator Indo Gas Tbk. (AGII), PT Asiaplast Industries Tbk. (APLI), PT Ifishdeco Tbk. (IFSH), PT Unggul Indah Cahaya Tbk. (UNIC), PT Kabelindo Murni Tbk. (KMLM) in 2021; PT Apexindo

Pratama Duta Tbk. (APEX), PT Samator Indo Gas Tbk. (AGII), PT Asiaplast Industries Tbk. (APLI), PT Saranacentral Bajatama Tbk. (BAJA), PT Chemstar Indonesia Tbk. (CHEM) in 2022; and PT Apexindo Pratama Duta Tbk. (APEX), PT Intanwijaya Internasional Tbk. (INCI), PT Emdeki Utama Tbk. (MDKI), PT Pabrik Kertas Tjiwi Kimia Tbk. (TKIM) in 2023. The maximum value is 5, held by PT Adaro Energy Indonesia Tbk. (ADRO) in 2020; PT Adaro Energy Indonesia Tbk. (ADRO), PT Bukit Asam Tbk. (PTBA), PT Aneka Tambang Tbk. (ANTM), PT Timah Tbk. (TINS), PT Austindo Nusantara Jaya Tbk. (ANJT) in 2021; PT Adaro Energy Indonesia Tbk. (ADRO), PT Bukit Asam Tbk. (PTBA), PT Solusi Bangun Indonesia Tbk. (SMCB), PT Timah Tbk. (TINS), PT Austindo Nusantara Jaya Tbk. (ANJT) in 2022; PT Adaro Energy Indonesia Tbk. (ADRO), PT Perusahaan Gas Negara Tbk. (PGAS), PT Bukit Asam Tbk. (PTBA), PT Aneka Tambang Tbk. (ANTM), Semen Indonesia (Persero) Tbk. (SMCB) in 2023. The mean value is 3.14, indicating that, on average, companies received a PROPER rating of 3 or blue category. The standard deviation is 0.717, which is smaller than the mean, indicating a relatively close data distribution for environmental performance.

c) The profitability variable has a minimum value of 0.001, held by PT Voksel Electric Tbk. (VOKS), PT Chitose Internasional Tbk. (CINT), PT Kimia Farma Tbk. (KAEF) in 2020; PT Mustika Ratu Tbk. (MRAT) in 2021; PT Eagle High Plantations Tbk. (BWPT) in 2022. The maximum value is 0.944, held by PT Prasidha Aneka Niaga Tbk. (PSDN) in 2023. The mean value for profitability is 0.083. The standard deviation is 0.088, which is higher than the mean, indicating a relatively wide distribution of profitability data.
d) The institutional ownership variable has a minimum value of 0.002, held by PT Campina Ice Cream Industry Tbk. (CAMP) in 2021–2022. The maximum value is 0.999, held by PT Citra Tubindo Tbk. (CTBN) in 2023. The mean value for institutional ownership is 0.771. The standard deviation is 0.253, which is lower than the mean, indicating that the distribution of institutional ownership data is relatively close.
e) The firm size control variable has a minimum value of 23.651, held by PT AKR Corporindo Tbk. (AKRA) in 2020. The maximum value is 39.283, held by PT Medco Energi Internasional Tbk. (MEDC) in 2023. The mean value for firm size is 29.861. The standard deviation is 2.047, which is lower than the mean, indicating that the data distribution for firm size is relatively close..
f) The firm age control variable has a minimum value of 8, held by PT Waskita Beton Precast Tbk. (WSBP) in 2021. The maximum value is 117, held by PT PP London Sumatra Indonesia Tbk. (LSIP) in 2023. The mean value for firm age is 47.00. The standard deviation is 19.318, which is lower than the mean, indicating that the data distribution for firm age is relatively close.

Classical Assumption Test

Normality Test

Table 2. Normality Test Results

		Unstandardized Residual
N		332
Normal Parameters[a, b]	Mean	0,000
	Standard Deviation	0.563
	Absolute	0.043
Most Extreme Differences	Positive	0.032
	Negative	-0.043
Test Statistics		0.043
Asymp. Sig.(2-tailed)		0.200

Source: Processed data, 2025

As shown in Table 2, the Kolmogorov-Smirnov value is 0.043 and the Asymp. Sig. (2-tailed) value is 0.200. Since the significance value of the Kolmogorov-Smirnov test exceeds 0.05, the regression model is considered to be normally distributed.

Multicollinearity Test

	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
ENVPERF	0.844	1,184
ROA	0.957	1,045
INS	0.965	1,036
SIZE	0.867	1,153
AGE	0.978	1,022

Table 3. Multicollinearity Test Results
Source: Processed data, 2025

Based on Table 3, the tolerance values for all independent and control variables—environmental performance, profitability, institutional ownership, firm size, and firm age—are above 0.10 and their VIF values are below 10. This indicates that the regression model is free from multicollinearity.

Heteroscedasticity Test

Table 4. Results of Heteroscedasticity Test

	Sig.(2-tailed)	Information
ENVPERF	0.611	Free from heteroscedasticity
ROA	0.176	Free from heteroscedasticity
INS	0.373	Free from heteroscedasticity
SIZE	0.272	Free from heteroscedasticity
AGE	0.059	Free from heteroscedasticity

Source: Processed data, 2025

Based on Table 4, the Sig. (2-tailed) values for both the independent and control variables—environmental performance, profitability, institutional ownership, firm size, and firm age—are all greater than 0.05. This indicates that the regression model is free from heteroscedasticity symptoms.

a) Autocorrelation Test

Table 5. Autocorrelation Test Results

R	R Square	Adjusted R Square	Standard Error of the Estimate	Durbin-Watson
0.516	0.266	0.255	0.120	0.881

Source: Processed data, 2025

The regression model's Durbin-Watson value is 0.881. At a 5% significance level, with a sample size (n) of 332 and five independent variables (k), the Durbin-Watson table values are 1.79495 (dL) and 1.84400 (dU). The data passes the Durbin-Watson test if du < dw < 4 – du. In this study, the result 1.84400 > 0.881 < 2.1560 indicates the presence of autocorrelation or failure to pass the Durbin-Watson test.

According to Candradewi and Yasa (2018), to ensure a reliable study, the Cochrane-Orcutt method is applied. Ghozali (2018:121) explains that the Cochrane-Orcutt method is one of the techniques used to address autocorrelation by transforming data into lag form. The following are the results after applying the Cochrane-Orcutt method.

Table 6. Autocorrelation Test Results (Cochrane-Orcutt Method)

R	R Square	Adjusted R Square	Standard Error of the Estimate	Durbin-Watson
0.415	0.172	0.159	0.097	1,928

Source: Processed data, 2025

Based on Table 6, after applying the Cochrane-Orcutt method, the Durbin-Watson value increased to 1.928. Using a 5% significance level with 332 samples and five independent variables, the Durbin-Watson table indicates du = 1.84400. Therefore, the result 1.84400 < 1.928 < 2.1560 shows that the regression model is free from autocorrelation.

Multiple Linear Regression Analysis

Table 7. Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-8,562	1,690		-5,066	0.001
	ENVPERF	0.879	0.155	0.309	5,689	0.001
	ROA	0.725	0.586	0.063	1,237	0.217
	INS	-0.259	0.172	-0.077	-1,510	0.132
	SIZE	1,751	0.499	0.188	3,509	0.001
	AGE	-0.122	0.076	-0.081	-1,609	0.109
	AdjustedR2	0.177				
	F count	15,285				
	Sig. F	0.001b				

Source: Processed data, 2025

Based on Table 7, the resulting regression equation is as follows.

CED = -8.562 + 0.879ENVPERF + 0.725ROA – 0.259INS + 1.751SIZE – 0.122AGE

From the above regression equation, the following conclusions can be drawn:

a) The constant value of -8.562 indicates that if the environmental performance (ENVPERF) is zero (non-financial sector companies do not receive a PROPER score from the Ministry of Environment), profitability (ROA) is zero (non-financial sector companies do not earn profit), institutional ownership (INS) is zero (non-financial sector companies have no institutional shareholders), firm size (SIZE) is zero (the company owns no assets), and firm age (AGE) is zero (the company is newly established and has not yet completed one year), then the carbon emission disclosure (CED) will be -8.562.
b) The regression coefficient for environmental performance is 0.879. This positive coefficient indicates that if environmental performance increases by one unit, carbon emission disclosure will increase by 0.879 units, assuming other variables are held constant.
c) The regression coefficient for profitability is 0.725. This positive coefficient indicates that if profitability increases by one unit, carbon emission disclosure will increase by 0.725 units, assuming other variables are held constant.
d) The regression coefficient for institutional ownership is -0.259. This negative coefficient indicates that if institutional ownership increases by one percent, carbon emission disclosure will decrease by 0.259 units, assuming other variables are held constant.
e) The regression coefficient for firm size is 1.751. This positive coefficient indicates that if firm size increases by one unit, carbon emission disclosure will increase by 1.751 units, assuming other variables are held constant.
f) The regression coefficient for firm age is -0.122. This negative coefficient indicates that if firm age increases by one unit, carbon emission disclosure will decrease by 0.122 units, assuming other variables are held constant.

Coefficient of Determination Test (R2)

The coefficient of determination (R^2) test is conducted to measure the explanatory power of the independent variables in the regression model in describing the variance in the dependent variable. The R^2 value ranges between zero and one. The closer the R^2 value is to one, the better the independent variables explain the variation in the dependent variable.

Ghozali (2018:147) stated that an Adjusted R Squared value approaching one implies that the independent variables are capable of explaining the dependent variable. The Adjusted R Squared value in this study is 0.177, which means that 17.7 percent of the variation in carbon emission disclosure among non-financial companies listed on the Indonesia Stock Exchange from 2020 to 2023 is influenced by the variables in this study, namely environmental performance, profitability, institutional ownership, firm size, and firm age. The

remaining 82.3 percent is influenced by other variables outside the regression model used in this research.

Model Feasibility Test (F Test)

The F-test in this study is used to assess the feasibility of the research model. Essentially, the F-test aims to determine whether all independent variables, including the control variables, jointly have an effect on the dependent variable. The F-test result is interpreted by comparing the significance level of the F-statistic with $\alpha = 0.05$. If the significance level is less than α, the model is considered feasible. Conversely, if the significance level is greater than or equal to α, the regression model is deemed unfit. Table 4.8 shows the result of the F-test.

The F-test result shows an F-statistic value of 15.285 with a significance value of 0.001, which is less than 0.05. Thus, environmental performance, profitability, and institutional ownership (along with control variables of firm size and firm age) have a simultaneous significant effect on carbon emission disclosure, indicating that the research model is feasible for use.

Hypothesis Testing (T-Test)

The hypothesis testing or t-test aims to determine the partial effect of each independent variable on the dependent variable, assuming other variables remain constant. If the significance value is < 0.05, the hypothesis can be accepted, and the independent variable is considered to have a significant effect on the dependent variable. Conversely, if the significance value is > 0.05, the hypothesis is rejected, and the independent variable is considered not to have a significant effect.

The independent variable environmental performance has a regression coefficient value of 0.879 and a significance value of $0.001 < \alpha = 0.05$. This indicates that environmental performance has a positive and significant effect on carbon emission disclosure, so H1, which states that environmental performance has a positive effect on carbon emission disclosure, is accepted. The independent variable profitability has a regression coefficient value of 0.725 and a significance value of $0.217 > \alpha = 0.05$. This indicates that profitability has no significant effect on carbon emission disclosure, so H2, which states that profitability has a positive effect on carbon emission disclosure, is rejected. The independent variable institutional ownership has a regression coefficient value of -0.259 and a significance value of $0.132 > \alpha = 0.05$. This indicates that institutional ownership has a negative and insignificant effect on carbon emission disclosure, so H3, which states that institutional ownership has a positive effect on carbon emission disclosure, is rejected.

The control variable firm size has a regression coefficient value of 1.751 and a significance value of $0.001 < \alpha = 0.05$. This result shows that firm size has a positive coefficient and a significant effect on carbon emission disclosure. The control variable firm age has a regression coefficient value of -0.122 and a significance value of $0.109 > \alpha = 0.05$. This result indicates that firm age has a negative coefficient and no significant effect on carbon emission disclosure.

Discussion of Research Findings

The Effect of Environmental Performance on Carbon Emission Disclosure

Based on the analysis results, the environmental performance variable has a positive effect on carbon emission disclosure, thus the first hypothesis in this study is accepted. This means that the better the environmental performance, as proxied by PROPER, the higher the level of carbon emission disclosure carried out by non-financial companies in their sustainability reports. An increase in the PROPER rating can serve as an encouragement for companies to be more transparent in disclosing the carbon emissions they produce. PROPER also functions as an indicator for assessing the company's environmental performance, as demonstrated through a color rating system. Companies that exhibit proactive environmental attitudes, as reflected in their PROPER ratings, have incentives to voluntarily disclose information about carbon emissions to investors and other external parties to demonstrate the success of their environmental strategies (Aji et al., 2023). Such environmental performance serves as evidence that the company has made efforts to protect and preserve its surrounding environment (Ardillah & Rusli, 2022).

The Effect of Profitability on Carbon Emission Disclosure

Based on the analysis results, the profitability variable has no effect on carbon emission disclosure, thus the second hypothesis in this study is rejected. This indicates that a company's ability to generate profit does not influence non-financial companies to disclose carbon emissions in their sustainability reports. This may occur due to demands from the company's stakeholders, where stakeholders impose other expectations on the company regarding the use of profits for developing other aspects of the company rather than disclosing carbon emissions (Kholmi et al., 2020). The data period used in this study coincides with the COVID-19 pandemic, during which company profits were likely allocated toward recovering financial conditions affected by the pandemic (Setiawan & Kusuma, 2023).

The Effect of Institutional Ownership on Carbon Emission Disclosure

Based on the analysis results, the institutional ownership variable has no effect on carbon emission disclosure, thus the third hypothesis in this study is rejected. This means that a higher level of institutional ownership does not influence non-financial companies to disclose carbon emissions in their sustainability reports. Institutional investors may still perceive that carbon emission disclosure contributes less to firm value compared to other factors such as liquidity or profitability. Therefore, a high percentage of institutional ownership does not necessarily encourage carbon emission disclosure (Pramudtya & Budiasih, 2020). Institutional investors appear not to exert enough pressure to promote the disclosure of carbon emission-related information. This could be due to the low prioritization of sustainability issues in institutional investors' investment decisions.

5. CONCLUSION

The results of this study indicate that environmental performance has a positive effect on carbon emission disclosure. Companies with stronger environmental performance, as reflected in their PROPER ratings, are more likely to disclose carbon emissions in sustainability reports, demonstrating their commitment to environmental transparency and sustainability issues. In contrast, profitability is found to have no effect on carbon emission disclosure, suggesting that higher profits do not necessarily motivate companies to disclose such information, as disclosure decisions are more influenced by internal managerial policies than by financial outcomes. Similarly, institutional ownership shows no effect on carbon emission disclosure, implying that the dominance of institutional investors does not automatically pressure companies to enhance transparency in sustainability reporting, as these investors may prioritize financial aspects over environmental concerns.

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