

The Effect of Institutional Ownership, Managerial Ownership, Audit Committee, Gender Diversity and Profitability on Carbon Emissions Disclosure

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ABSTRACT

This study aims to examine the effect of institutional ownership, managerial ownership, audit committee, gender diversity, and profitability on Carbon Emission Disclosure (CED) in non-financial companies listed on the Indonesia Stock Exchange during the 2021-2024 period. This study uses secondary data obtained from the annual reports and sustainability reports of companies with a total of 224 observations. Carbon Emission Disclosure (CED) Index, while profitability was measured using Return on Assets (ROA). The data were analyzed using multiple linear regression after passing the classical assumption tests. The results indicate that institutional ownership, managerial ownership, and gender diversity have a negative and significant effect on Carbon Emission Disclosure (CED), whereas the audit committee and profitability, measured by Return on Assets (ROA), do not affect Carbon Emission Disclosure (CED).

Keywords: Carbon Emission Disclosure, Institutional Ownership, Managerial Ownership, Audit Committee, Gender Diversity, Profitability.

JEL Code: E44, F31, F37, G15.

I. Introduction

Climate change is one of the most urgent global challenges affecting environmental, social, and economic sustainability worldwide. This phenomenon has exacerbated various extreme weather events that have caused huge losses in various countries (Climate Change Worsens 10 Deadliest Extreme Weather Events Since 2004, 2024). In addition, global temperatures are expected to continue to set heat records in the coming years, underscoring the urgency of reducing greenhouse gas emissions (Global Temperatures Likely to Set New Records in Next 5 Years, 2025). In this context, Carbon Emission Disclosure (CED) is an important part of sustainable business practices because it provides information about the company's contribution to greenhouse gas emissions and mitigation strategies carried out. In Indonesia, the issue of carbon emissions disclosure is getting more attention as demands for transparency from investors, regulators, and the public increase. Carbon emissions disclosure not only serves as a form of environmental accountability, but also functions as an instrument to enhance corporate legitimacy and strengthening investor confidence. Previous research has shown that internal factors of a company, such as managerial ownership, institutional ownership, and audit committees, have an effect on the level of environmental information disclosure (Scottsdale & Scott,

2020; Simamora et al., 2022). In addition, the company's profitability also affects the company's ability to support sustainability reporting and environmental management (Hapsoro & Sulistyarini, 2019).

Global pressure on the implementation of Environmental, Social, and Governance (ESG) principles has also encouraged companies to be more transparent in reporting carbon emissions. Indonesia, as part of the Paris Agreement, has also set a target to reduce carbon emissions until 2030 (MoEF, 2023). Under these conditions, companies that are able to manage and disclose carbon emissions properly will have higher competitiveness and are better prepared to face regulatory and reputational risks. Furthermore, gender diversity on the board of directors has increasingly been recognized as an important factor influencing corporate sustainability practices and environmental disclosure. The presence of women in managerial positions is considered capable of encouraging decision-making that pays greater attention to social and environmental aspects, thereby supporting better sustainability reporting practices.

As sustainability issues become more prominent, carbon emission disclosure is no longer merely associated with regulatory compliance, but also represents a strategic effort by companies to maintain competitiveness, improve corporate reputation, and ensure long-term business sustainability. Therefore, companies are increasingly expected to disclose environmental information transparently to meet stakeholders' expectations and strengthen their commitment to sustainable development. Although much research has been done on the disclosure of carbon emissions, the results of previous studies still show mixed findings. Some studies have found that corporate governance mechanisms have a significant effect on carbon emissions disclosure, while other studies show different results (Angelina & Handoko, 2023; Hamdiyani, 2023). These differences in results show that there is still a research gap related to the determinants of carbon emission disclosure, especially in companies in Indonesia. Moreover, most previous studies have focused on specific governance factors separately and have not comprehensively integrated ownership structure, gender diversity, and profitability within a single research model. This condition indicates the need for further investigation to provide a more comprehensive understanding of the factors influencing carbon emission disclosure, particularly during the increasing implementation of ESG principles and sustainability reporting practices in Indonesia.

Therefore, this study aims to analyze the influence of institutional ownership, managerial ownership, audit committee, gender diversity, and profitability on carbon emission disclosure in companies listed on the Indonesia Stock Exchange for the 2021–2023 period. This research is expected to contribute to the development of sustainability literature, particularly regarding the determinants of carbon emission disclosure, and provide practical implications for companies and policymakers in improving environmental transparency and strengthening sustainability practices.

II. Literature Review and Hypothesis Development

2.1. Theoretical Foundations

The theory of legitimacy explains that companies must carry out activities that are in accordance with the values and expectations of society in order to gain social acceptance (Suchman, 1995). One form of effort to gain this legitimacy is through transparency of environmental information, including the disclosure of carbon emissions. By disclosing information related to carbon emissions, the company demonstrates its commitment to sustainability and environmental responsibility. In this study, Legitimacy Theory serves as the primary theoretical framework because it explains that companies disclose carbon emissions to obtain and maintain social legitimacy from stakeholders. Therefore, institutional ownership, managerial ownership, audit committees, gender diversity, and profitability are expected to encourage companies to disclose carbon emissions more extensively as a strategy to maintain legitimacy and enhance corporate reputation. Stakeholder theory put forward by (Freeman & McVea, 1984) states that the company is not only responsible to shareholders, but also to all stakeholders such as society, government, investors, and the environment. In the context of carbon emission disclosure, companies are encouraged to meet stakeholder demands through

environmental information disclosure to maintain the company's legitimacy and credibility. Therefore, carbon emission disclosure is seen as a company's strategy in meeting stakeholder expectations while improving the company's reputation (Angelina & Handoko, 2023). This theory complements Legitimacy Theory by emphasizing that companies need to respond to stakeholder expectations through transparent environmental reporting practices, including carbon emission disclosure.

Agency theory introduced by (Jensen & Meckling, 1976) explain the existence of a conflict of interest between shareholders as principal and management as agents. To reduce these conflicts, corporate governance mechanisms such as institutional ownership, managerial ownership, and audit committees are needed. Institutional ownership is seen as able to increase supervision of management so as to encourage environmental information disclosure (Amaliyah & Solikhah, 2019). Meanwhile, managerial ownership can align the interests of managers with shareholders thereby encouraging more transparent reporting practices (Puspita Wulandari et al., 2024; Yusuf, 2021). Thus, the agency's theory provides the basis that corporate governance mechanisms play an important role in encouraging carbon emission disclosure. Moreover, effective governance mechanisms are expected to reduce information asymmetry and strengthen corporate legitimacy through more transparent environmental disclosure practices. In addition, the signal theory put forward by (Spence, 1973) explains that the company can provide a positive signal to external parties through information disclosure, including environmental disclosure. Companies with high profitability tend to be more able to disclose sustainability information as a form of signal that the company has good performance and prospects (Hapsoro & Sulistyarini, 2019). The disclosure of carbon emissions is also a signal that the company has concern for climate change and sustainability issues so that it can increase the reputation and trust of investors. Therefore, Signaling Theory complements Legitimacy Theory by explaining that carbon emission disclosure is not only a form of accountability but also a strategic signal regarding the company's sustainability performance and long-term prospects.

2.2. Research Variables

Institutional ownership is the proportion of a company's shares owned by a financial institution or investment institution. Institutional investors have stronger supervisory capabilities so that they can encourage companies to increase the transparency of environmental information. Research (Saka & Oshika, 2014) shows that carbon emissions disclosure can increase a company's value so that institutional investors are likely to encourage companies to improve the quality of carbon reporting. Research in Indonesia also shows that institutional ownership has an effect on carbon emission disclosure (Amaliyah & Solikhah, 2019; Angelina & Handoko, 2023). From the perspective of Legitimacy Theory, institutional investors encourage firms to improve environmental transparency in order to meet stakeholders' expectations and maintain corporate legitimacy. Managerial ownership is the proportion of shares owned by the company's management. In agency theory, managerial ownership functions to align the interests of management with shareholders so as to encourage corporate transparency (Jensen & Meckling, 1976). However, the results of research in Indonesia still show mixed findings. (Simamora et al., 2022) found that managerial ownership does not always have a significant effect on carbon emissions disclosure, so this relationship is still interesting to re-examine. Managerial ownership is expected to align managers' interests with long-term corporate sustainability objectives, including carbon emission disclosure practices that support corporate legitimacy.

The audit committee is an internal oversight mechanism that assists the board of commissioners in ensuring the quality of the company's reporting, including sustainability reporting. The existence of an effective audit committee is believed to be able to increase the transparency of carbon emission disclosures (Angelina & Handoko, 2023; Chariri et al., 2018). In the perspective of agency theory, audit committees help reduce information asymmetry between management and shareholders through better oversight functions. Furthermore, an effective audit committee strengthens corporate legitimacy by ensuring transparency and accountability in sustainability and carbon reporting. Gender diversity refers to the representation of women on the board of directors or commissioners. The presence of women on the board is believed to increase the

company's sensitivity to social and environmental issues. Research (Ben-Amar et al., 2017; Elmagrhi et al., 2019) suggests that companies with more diverse boards tend to be more transparent in sustainability disclosures, including carbon emissions. However, some studies in Indonesia still show inconsistent results so this variable is still relevant for further research. Gender diversity contributes to broader perspectives in corporate decision-making and enhances firms' responsiveness to environmental and sustainability issues, thereby supporting more comprehensive carbon emission disclosure.

Profitability reflects a company's ability to generate profits. Companies with high profitability have greater resources to support sustainability practices and environmental disclosure (Dharma et al., 2024). In addition, profitability is also a positive signal for investors regarding the company's prospects (Eccles et al., 2014). Therefore, more profitable companies tend to undertake broader carbon emissions disclosure as a form of corporate legitimacy and reputation strategy. Highly profitable firms possess greater financial resources to implement sustainability initiatives and disclose carbon emissions more comprehensively, thereby strengthening their legitimacy and signaling superior corporate performance. Carbon Emission Disclosure (CED) is a form of transparency for companies in reporting operational impacts on the environment, especially greenhouse gas emissions (Simamora et al., 2022). This disclosure is important because it provides information to stakeholders about the company's commitment to climate change mitigation. In this study, the level of carbon emission disclosure was measured using the CED index developed by (Choi et al., 2013), which consists of 18 disclosure items related to greenhouse gas emissions, energy consumption, emission reduction, emissions management accountability, and external verification of reports.

2.3. Previous Research and Hypotheses

Previous research has shown that carbon emissions disclosure is influenced by various factors of corporate governance and financial performance. Research (Angelina & Handoko, 2023; Budanti et al., 2024) shows that institutional ownership has a positive effect on carbon emission disclosure. Based on Legitimacy Theory, companies with higher institutional ownership tend to disclose carbon emissions more extensively to satisfy stakeholders' expectations and maintain legitimacy. Therefore:

H1: Institutional ownership affects Carbon Emission Disclosure (CED).

Meanwhile, research related to managerial ownership still shows mixed results (Hamdiyani, 2023; Simamora et al., 2022). Agency Theory suggests that managerial ownership aligns managerial and shareholder interests, thereby encouraging greater environmental transparency and carbon emission disclosure. Therefore:

H2: Managerial ownership affects Carbon Emission Disclosure (CED).

On the audit committee variable, most studies show a positive influence on the transparency of carbon emissions (Scottsdale & Scott, 2020; Simamora et al., 2022). An effective audit committee strengthens monitoring functions and promotes more comprehensive carbon emission disclosure, thereby enhancing corporate accountability and legitimacy. Therefore:

H3: Audit committee affects Carbon Emission Disclosure (CED).

In addition, international research by (Ben-Amar et al., 2017) shows that gender diversity can improve the quality of sustainability disclosure. Gender diversity enhances environmental awareness and supports broader sustainability disclosure practices, including carbon emission disclosure. Therefore:

H4: Gender diversity affects Carbon Emission Disclosure (CED).

In terms of profitability, research (Hamdiyani, 2023) shows a positive influence on carbon emission disclosure. Signaling Theory explains that profitable companies disclose environmental information, including carbon emissions, to signal superior corporate performance and sustainability commitment. Therefore:

H5: Profitability affects Carbon Emission Disclosure (CED).

III. Research Method

This study is quantitative research with an associative approach that aims to examine the influence of institutional ownership, managerial ownership, audit committee, gender diversity, and profitability on Carbon Emission Disclosure (CED). The data used is in the form of secondary data obtained from the annual report and sustainability report of companies listed on the Indonesia Stock Exchange (IDX) for the 2021–2024 period. Hypothesis testing was carried out using multiple linear regression analysis with the help of the SPSS application. This research design was selected because it is considered appropriate for examining the causal relationship between corporate governance mechanisms, firm characteristics, and Carbon Emission Disclosure (CED) based on the perspectives of Legitimacy Theory, Agency Theory, and Signaling Theory. The research population includes all companies listed on the IDX during the 2021–2024 period. The sample was determined using the purposive sampling method based on several criteria, namely companies that publish complete annual reports and sustainability reports, do not experience delisting during the research period, disclose carbon emission information or environmental activities, and have complete data related to all research variables. These criteria are used so that the data obtained is relevant and in accordance with the purpose of the research. The purposive sampling technique was selected because it enables the researcher to obtain companies that meet specific criteria relevant to the objectives of this study, particularly companies that consistently disclose sustainability and carbon emission information during the observation period.

Data collection is carried out through documentation techniques by utilizing secondary data sourced from the annual report, sustainability report, and the company's official website. The annual reports and sustainability reports were accessed through the official website of the Indonesia Stock Exchange (IDX) as well as the official websites of each company to ensure the reliability, completeness, and consistency of the data used in this study. The annual report is used to obtain data on ownership structure, profitability, and the composition of the board of directors, while the sustainability report is used to obtain information related to carbon emission disclosure and the company's sustainability practices. The dependent variable in this study is the disclosure of carbon emissions measured using the Carbon Emission Disclosure Index (CED) Index developed by (Choi et al., 2013) and adopted by (Kurnia et al., 2021). The index consists of 18 disclosure items that include greenhouse gas emissions, energy consumption, emission reduction, emissions management accountability, and external verification. Each item is given a score of 1 when disclosed and 0 if not disclosed, then calculated as a percentage. Independent variables in this study include institutional ownership, managerial ownership, audit committee, gender diversity, and profitability. Institutional ownership is measured by the percentage of shares held by institutional investors relative to the total outstanding shares, following Angelina and Handoko (2023). Managerial ownership is measured by the percentage of shares owned by management, based on Budiharta and Kacaribu (2020). The audit committee is measured by the number of audit committee members, following Angelina and Handoko (2023). Gender diversity is measured by the proportion of female directors on the board of directors, referring to Budanti et al. (2024), while profitability is proxied by Return on Assets (ROA), following the measurement adopted by D. Hamdiyani (2023). The selection of these measurements is based on previous studies and is considered appropriate for explaining the determinants of Carbon Emission Disclosure in Indonesian listed companies.

Data analysis was carried out through several stages, namely descriptive statistics, classical assumption tests, multiple linear regression analysis, and hypothesis tests. Descriptive statistics are used to provide an overview of research data through minimum, maximum, average, and standard deviation values.

The classical assumption test includes the normality test using the Kolmogorov-Smirnov, the multicollinearity test with tolerance values and Variance Inflation Factor (VIF), the heteroscedasticity test using the Glejser test, and the autocorrelation test with Durbin-Watson. Prior to hypothesis testing, all classical assumption tests were conducted to ensure that the regression model fulfilled the assumptions of normality, absence of multicollinearity, homoscedasticity, and no autocorrelation. If any potential violation was identified, appropriate corrective measures were considered to maintain the robustness of the regression model.

Furthermore, the influence of independent variables on carbon emission disclosure was analyzed using multiple linear regression with the model:

$$PEC = \alpha + \beta_1 KI + \beta_2 KM + \beta_3 KA + \beta_4 GD + \beta_5 PROF + e$$

Hypothesis testing was carried out through simultaneous tests (F test), partial tests (t tests), and determination coefficients (R^2) with a significance level of 5%. The entire data analysis process was carried out using IBM SPSS Statistics software and Microsoft Excel for data input and content analysis of Carbon Emission Disclosure. IBM SPSS was selected because it is widely used in quantitative research and is capable of processing statistical analyses systematically, accurately, and efficiently.

IV. Results and Discussion

4.1. Analysis Result

Table 1. Descriptive Statistics of Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
IO	224	1.00	100.00	68.2857	19.43388
MO	224	0.000	69.00	6.2723	13.45352
AC	224	3	5	3.0804	0.33182
GD	224	0.000	60.00	11.5714	12.03076
ROA	224	-15.00	5569.00	34.5625	371.63034
CED	224	0.000	100.00	63.7366	27.92539

Table 1. presents the descriptive statistics of all research variables based on 224 firm-year observations. The descriptive statistics provide an overview of the distribution and characteristics of each variable used in this study, including institutional ownership (IO), managerial ownership (MO), audit committee (AC), gender diversity (GD), profitability (ROA), and carbon emission disclosure (CED). The descriptive statistics indicate that the research variables exhibit different levels of variation across the sampled companies. The audit committee variable has the lowest standard deviation (0.33182), indicating relatively low variation among the sampled companies. In contrast, profitability (ROA) has the highest standard deviation, indicating greater variation in firms' financial performance. Meanwhile, the mean Carbon Emission Disclosure (CED) score reflects the average level of carbon emission disclosure among the sampled companies.

Overall, the descriptive statistics demonstrate that the sampled companies have relatively diverse characteristics in terms of corporate governance, financial performance, and carbon emission disclosure practices. The variation observed across the research variables indicates differences in corporate governance characteristics, profitability, and carbon emission disclosure among the sampled companies. These findings provide an initial overview of the data and will be further examined using multiple linear regression analysis. The descriptive statistics also indicate that carbon emission disclosure among Indonesian non-financial companies remains relatively diverse. This finding suggests that companies have different levels of commitment to environmental transparency and sustainability reporting, reflecting variations in corporate

governance practices and environmental awareness. The considerable variation in disclosure practices further indicates that carbon emission disclosure remains largely voluntary and differs substantially across firms.

a. Classic Assumption Test

1) Normality Test

The following are the results of the normality test using the Kolmogorov-Smirnov and Shapiro-Wilk methods:

Table 2. Normality Test Results

Variable	Kolmogorov-Smirnov Sig.	Shapiro-Wilk Sig.
Residual	0,000	0,000

The test results showed that the significance value of both the Kolmogorov-Smirnov and Shapiro-Wilk test were 0.000, which are lower than 0.05. These results indicate that the residuals are not normally distributed. However, the regression model can still be used because the sample consists of 224 observations. Based on the Central Limit Theorem, a sufficiently large sample size reduces the impact of non-normality on parameter estimation. Therefore, the regression model remains appropriate for hypothesis testing.

2) Multicollinearity Test

Table 3. Multicollinearity Test Results

Variable	Tolerance	VIF	Remarks
IO	0.499	2.004	Multicollinearity does not occur
MO	0.443	2.256	Multicollinearity does not occur
AC	0.809	1.236	Multicollinearity does not occur
GD	0.989	1.011	Multicollinearity does not occur
ROA	0.988	1.012	Multicollinearity does not occur

The test results showed that all variables had a *Tolerance* value above 0.10 and a VIF value below 10. This value indicates that there is no strong linear relationship between independent variables. This condition indicates that each independent variable can explain the dependent variable independently without being affected by high correlations among the independent variables. The absence of multicollinearity indicates that the independent variables represent different aspects of corporate governance and firm performance. Therefore, each independent variable contributes independently to explaining variations in carbon emission disclosure without being affected by strong linear relationships among the explanatory variables.

3) Heteroscedasticity Test

The heteroscedasticity test was conducted to determine whether the residuals in the regression model have unequal variance. In this study, heteroscedasticity was tested using the Glejser test. The decision criterion is that a significance value greater than 0.05 indicates the absence of heteroscedasticity, whereas a significance value less than 0.05 indicate the presence of heteroscedasticity.

The results of the Glejser test are presented in Table 4:

Table 4. Results of the Heteroscedasticity Test

Variable	Sig.	Remarks
IO	0.006	Heteroscedasticity occurs
MO	0.621	No heteroscedasticity occurs

AC	0.986	No heteroscedasticity occurs
GD	0.704	No heteroscedasticity occurs
ROA	0.145	No heteroscedasticity occurs

The Glejser test results show that the Institutional ownership (IO) variable has a significance value of 0.006, which is lower than 0.05. This indicates that heteroscedasticity is present in this variable. Meanwhile, the Managerial Ownership (MO), Audit Committee (AC), Gender Diversity (GD), and profitability (ROA) variable have significance value greater than 0.05, indicating that they do not exhibit heteroscedasticity. Therefore, the result of the Glejser test indicate that the regression model still exhibits heteroscedasticity in the Institutional Ownership (IO) variable. Accordingly, the findings of this study should be interpreted with consideration of this limitation in the regression model. Although heteroscedasticity was detected in the institutional ownership variable, the regression model was retained because the violation occurred only in one explanatory variable and did not invalidate the overall regression analysis. Nevertheless, the results should be interpreted cautiously because heteroscedasticity may reduce the efficiency of the estimated coefficients.

4) Autocorrelation Test

Table 6. Autocorrelation Test Results

Models	Durbin-Watson	Remarks
1	1.904	No autocorrelation occurs

The autocorrelation test was conducted using the Durbin-Watson (DW) statistic to determine whether the regression model exhibited serial correlation among the residuals. As presented in Table 6, the Durbin-Watson value is 1.904, which falls within the acceptable range of 1.5-2.5. The result indicates that the regression model does not suffer from autocorrelation, meaning that the residuals are independent across observations. Therefore, the regression model satisfies the autocorrelation assumption and is considered appropriate for multiple linear regression analysis and subsequent hypothesis testing.

b. Hypothesis Test

1) Multiple Linear Regression Analysis

Multiple linear regression analysis was used to examine the relationship between institutional ownership (IO), managerial ownership (MO), audit committee (AC), gender diversity (GD), and profitability (ROA) on carbon emission disclosure (CED). The results of multiple linear regression analysis are presented in Table 7.

Table 2. Multiple Linear Regression Analysis Results

Variable	B	t	Sig.	Remarks
(Constant)	65.023	3.129	0.002	
IO	-0.305	-2.323	0.021	H1 accepted
MO	-0.652	-3.236	0.001	H2 accepted
AC	9.258	1.532	0.127	H3 rejected
GD	-0.431	-2.861	0.005	H4 accepted
ROA	0.003	0.701	0.484	H5 rejected

Based on the regression analysis, the estimated regression equation is as follows:

$$CED = 65.023 - 0.305 IO - 0.652 MO + 9.258 AC - 0.431 GD + 0.003 ROA + e$$

The regression results indicate that institutional ownership, managerial ownership, and gender diversity have negative regression coefficients, suggesting that increases in these variables are associated with lower level of carbon emission disclosure, assuming the other variables remain constant. In contrast, the audit committee and profitability, proxied by Return on Assets (ROA), have positive regression coefficients, indicating a positive relationship with carbon emission disclosure. However, based on the significance values, only institutional ownership, managerial ownership, and gender diversity have a statistically significant effect on carbon emission disclosure, whereas the audit committee and profitability do not affect carbon emission disclosure. These findings indicate that governance variables do not necessarily influence environmental disclosure in the same direction. Their effectiveness depends on how governance mechanisms are implemented to support environmental accountability rather than merely fulfilling formal governance requirements.

2) T test (Partial)

The results of the partial t-test indicated that institutional ownership has a negative and statistically significant effect on carbon emission disclosure ($\beta = -0.305$; $p = 0.021$), supporting H1. Managerial ownership also has a negative and statistically significant effect ($\beta = -0.652$; $p = 0.001$), supporting H2. In contrast, the audit committee has a positive but does not have statistically effect on carbon emission disclosure ($\beta = 9.258$; $p = 0.127$); therefore, H3 is rejected. Gender diversity has a negative and statistically significant effect ($\beta = -0.431$; $p = 0.005$), supporting H4. Meanwhile, profitability, proxied by Return on Assets (ROA), has a positive but does not have statistically effect on carbon emission disclosure ($\beta = 0.003$; $p = 0.484$). Therefore, H5 is rejected.

3) F Test (Simultaneous)

The F-test was conducted to examine whether institutional ownership, managerial ownership, audit committee, gender diversity, and profitability simultaneously affect carbon emission disclosure. The results are presented in Table 8.

Table 3. F Test Results

Source	F	Sig.
Regression	4.327	<0.001

The regression model produced an F-value of 4.327 with a significance value of $p < 0.001$. Since the significance value is less than 0.05, institutional ownership, managerial ownership, audit committee, gender diversity, and profitability jointly have a significant effect on carbon emission disclosure. These findings indicate that the regression model is statistically significant and suitable for explaining carbon emission disclosure as well as for subsequent hypothesis testing.

4) Coefficient of Determination (R^2)

The coefficient of determination (R^2) was used to measure the ability of the independent variables to explain the variation in the dependent variable. The results are presented in Table 9.

Table 9. Coefficient of Determination

R Square	Adjusted R Square
0.090	0.069

The results indicate that the Adjusted R Square is 0.069, meaning that institutional ownership, managerial ownership, audit committee, gender diversity, and profitability jointly explain 6.9% of the variation in carbon emission disclosure. The remaining 93.1% is explained by other factors outside the regression model. Although the explanatory power of the model is relatively low, the F-test results indicate that the

regression model is statistically significant. Therefore, the model is considered appropriate for explaining carbon emission disclosure, although additional variables not included in this study may provide greater explanatory power in future research.

4.2. Discussion

a. The Effect of Institutional Ownership on Carbon Emission Disclosure

The results of this study show that institutional ownership has a significant negative effect on carbon emission disclosure. This means that the higher the institutional ownership, the lower the level of carbon emission disclosure. This finding suggests that institutional investors are more oriented toward financial efficiency and performance than environmental transparency. These findings are in line with the agency's theory (Jensen & Meckling, 1976), stakeholder theory (Freeman & McVea, 1984), the theory of legitimacy (Suchman, 1995), and signal theory (Spence, 1973). The results of this study are consistent with those of (Kiswanto et al., 2023), but differ from the findings of (Angelina & Handoko, 2023; Budanti et al., 2024). The inconsistency with previous studies may be attributed to differences in sample characteristics, observation periods, industrial sectors, and regulatory environments. Institutional investors in Indonesian companies may still prioritize financial performance over environmental accountability, resulting in lower carbon emission disclosure. This finding also implies that institutional investors may not yet incorporate environmental, social, and governance (ESG) considerations into their investment decisions to a sufficient extent. As a result, companies receive relatively limited pressure from institutional shareholders to improve environmental transparency and provide more comprehensive carbon emission disclosure.

b. The Influence of Managerial Ownership on Carbon Emission Disclosure

The results of this study show that managerial ownership has a significant negative effect on carbon emission disclosure. This finding suggest that managers who own company shares tend to be more selective in disclosing environmental information in order to maintain the company's image and interests. These findings are in line with the agency's theory (Jensen & Meckling, 1976), the theory of legitimacy (Suchman, 1995), stakeholder theory (Freeman & McVea, 1984), and signal theory (Spence, 1973). These results are in line with (Budiharta & Kacaribu, 2020), but in contrast to (Simamora et al., 2022). The difference from previous findings may indicate that managerial ownership does not always align managers' interests with broader sustainability objectives, particularly when environmental disclosure is considered voluntary. In addition, managers may perceive carbon emission disclosure as generating additional reporting costs without providing immediate financial benefits. Consequently, managerial shareholders may prefer to focus on improving operational efficiency rather than expanding voluntary environmental reporting.

c. The Influence of the Audit Committee on Carbon Emission Disclosure

The results of this study indicate that the audit committee does not affect carbon emission disclosure. These findings suggest that the number of audit committee members alone is insufficient to enhance environmental transparency. This finding is consistent with agency theory (Fama & Jensen, 1983), stakeholder theory (Freeman & McVea, 1984), legitimacy theory (Suchman, 1995), and signaling theory (Spence, 1973). The findings are consistent with those of (Al-Shaer et al., 2017), but differ from the results of (Angelina & Handoko, 2023; Chariri et al., 2018). This difference may arise because previous studies measured audit committee effectiveness using different indicators, such as meeting frequency or financial expertise, whereas this study only considers the number of audit committee members. These findings suggest that audit committee effectiveness depends not only on the number of committee members but also on their competence, independence, and environmental expertise.

d. The Influence of Gender Diversity on Carbon Emission Disclosure

The results of this study indicate that gender diversity has a significant negative effect on carbon emission disclosure. These findings suggest that increasing women's representation on corporate boards has not been able to encourage greater environmental transparency. This finding may be explained by the relatively low average proportion of women on corporate boards (11.56%), which limits their influence on strategic decision-making related to environmental disclosure. These findings are consistent with stakeholder theory (Freeman & McVea, 1984), legitimacy theory (Suchman, 1995), agency theory (Jensen & Meckling, 1976), and signaling theory (Spence, 1973). The findings are consistent with those of (Ladista et al., 2023; Pratama, 2021), but differ from the results of (Ben-Amar et al., 2017; Muhammad & Migliori, 2022). This inconsistency may also reflect differences in female board representation across countries and industries, where female directors may have varying levels of influence on environmental decision-making. These findings suggest that increasing the proportion of female directors alone may not automatically improve environmental transparency unless women are actively involved in strategic decision-making and sustainability governance.

e. The Effect of Profitability on Carbon Emission Disclosure

The results of this study indicate that profitability, proxied by Return on Assets (ROA), does not affect carbon emission disclosure. These findings suggest that a company's ability to generate profits is not a primary factor influencing environmental information disclosure. This result is consistent with signaling theory (Spence, 1973), legitimacy theory (Suchman, 1995), stakeholder theory (Freeman & McVea, 1984), and agency theory (Jensen & Meckling, 1976). The findings are consistent with those of (Yang et al., 2024), but differ from the results of (Hamdiyani, 2023; Hapsoro & Sulistyarini, 2019). The inconsistency with previous studies suggests that financial capability alone does not necessarily motivate firms to increase voluntary carbon emission disclosure. This result also indicates that environmental disclosure is more strongly influenced by external stakeholder expectations and regulatory requirements than by the availability of financial resources. Therefore, profitable companies are not necessarily more transparent in reporting carbon emissions.

Overall, the findings indicate that corporate governance mechanisms alone are insufficient to improve environmental transparency unless they are supported by strong organizational commitment and effective regulatory enforcement. Therefore, companies should integrate environmental sustainability into their long-term corporate strategies and ensure that governance mechanisms function not only as formal compliance instruments but also as drivers of responsible environmental management. Regulators should also strengthen environmental reporting standards and monitoring mechanisms to improve the quality and consistency of carbon emission disclosure. In addition, increasing stakeholder awareness of climate-related risks may encourage companies to disclose more comprehensive carbon emission information, thereby improving corporate accountability and supporting sustainable development objectives.

V. Conclusion

This study empirically examines the effect of institutional ownership, managerial ownership, audit committee, gender diversity, and profitability on carbon emission disclosure among non-financial companies listed on the Indonesia Stock Exchange during the 2021–2024 period. The findings indicated that institutional ownership, managerial ownership, and gender diversity have a negative and statistically significant effect on carbon emission disclosure. In contrast, the audit committee and profitability, proxied by Return on Assets (ROA), do not affect carbon emission disclosure. Overall, these findings suggest that strengthening corporate governance alone is insufficient to improve environmental transparency. Effective carbon emission disclosure depends on the interaction between corporate governance mechanisms, organizational commitment, stakeholder expectations, and regulatory enforcement. Therefore, companies should integrate environmental sustainability into their strategic decision-making processes, while regulators should strengthen reporting

standards and monitoring mechanisms to promote more transparent, consistent, and accountable carbon emission disclosure practices.

This study has several limitations. First, the sample is limited to non-financial companies listed on the Indonesia Stock Exchange during the 2021–2024 period, limiting the generalizability of the findings. Second, the study only includes five independent variables, whereas other factors, such as firm size, leverage, capital intensity, environmental performance, may also influence carbon emission disclosure. Third, carbon emission disclosure is measured using the Carbon Emission Disclosure (CED) Index, which involves subjective assessment based on annual reports and sustainability reports. Because the CED Index relies on publicly available disclosures, the measurement may not fully capture companies' actual environmental performance or carbon management practices. Furthermore, this study relies exclusively on secondary data obtained from annual reports and sustainability reports. Consequently, the analysis may not fully capture internal managerial considerations, environmental strategies, and decision-making processes related to carbon emission disclosure. Finally, the initial Glejser test indicated heteroscedasticity in the institutional ownership variable. Although the regression model was retained for hypothesis testing, this condition may have reduced the efficiency of the estimated coefficients and should therefore be considered when interpreting the findings.

Future studies are recommended to expand the observation period, include broader samples across different industries or countries, incorporate additional explanatory variables such as firm size, leverage, environmental performance, ESG performance, board independence, environmental committees, media exposure, and ownership concentration, and employ more advanced analytical techniques, such as panel data regression, robust regression, or generalized least squares (GLS), to improve the robustness, estimation accuracy, and generalizability of the findings. Future research may also complement secondary data with interviews or survey methods to obtain a more comprehensive understanding of managerial decision-making and corporate environmental disclosure practices.

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