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Research Article

The Effect of Managerial Ownership, Institutional Ownership, and Financial Performance on Carbon Disclouser Emissions in the Metal and Mineral Sub-sector Listed on the Indonesia Stock Exchange in 2021-2024

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Abstract: This study aims to examine the influence of managerial ownership, institutional ownership, and financial performance on carbon emission disclosure in metal and mineral sub-sector companies listed on the Indonesia Stock Exchange during 2021-2024. The method used is a quantitative approach with secondary data and purposive sampling technique, resulting in 100 observations from 25 companies. The results indicate that managerial ownership influences carbon emission disclosure, while institutional ownership has a significant negative effect and financial performance has an insignificant positive effect on carbon emission disclosure. due to differences in orientation in decision making

Keywords: Carbon Emission Disclosure; Financial Performance; Institutional Ownership; Managerial Ownership; Metal and Mineral Sub-sector.

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1. Introduction

Carbon emissions in Indonesia generally contribute to climate change because this challenge can threaten the existence of life on earth and also *financial performance* . *Carbon emission disclosure* is a strategic component in implementing modern corporate responsibility. Through comprehensive disclosure practices, companies can meet regulatory demands, increase investment attractiveness, and strengthen legitimacy in the eyes of stakeholders. With increasing attention to sustainability, the effectiveness of carbon emission reporting is a critical factor in reflecting a company's commitment to environmental management. (Feldman, J., & Roush, 2025) .

This is due to the increase in global temperatures from GHG emissions of around 1℃ above pre-industrial levels and will reach a temperature increase of 1.5℃ (Muhammad Madyan, 2024) . Carbon emissions arise from the operational activities of a company such as the use of fossil fuels, coal combustion, combustion of chemical compounds such as *chlorofluorocarbons* (CFCs), hydrofluorocarbons (HFCs), and *sulfur hexafluoride* (SF_6) which are

the main gases causing the greenhouse effect. The increase in the concentration of these gases in the air triggers the formation of the greenhouse gas phenomenon. (Ardelia, 2023) .

The Sustainable Energy Transition in Indonesia (SETI) consortium identified energy savings of 28.7 million kWh per year, potentially reducing operational costs by up to Rp10.3 billion and carbon emissions by approximately 13,300 tons of CO_2. Energy audits not only play a role in reducing costs and increasing industrial efficiency, but also contribute to achieving national climate targets , estimated to contribute up to 37% to the energy sector's emission reduction target by 2030. (Esdm, 2025) .

Among companies, *carbon emission disclosure* can provide excellent and profitable opportunities, especially for environmental performance (Imansari et al., 2024) . This can be seen in the large number of *carbon emission disclosures* to meet sustainable growth for companies, especially for financial matters (Nastiti & Hardiningsih, 2022) . By implementing *carbon emission disclosure* , especially in companies, they will be more focused on running their business with environmental considerations. This has become an important corporate strategy for them (Marini et al., 2024) .

Several previous studies have shown mixed results regarding the influence of *managerial ownership, institutional ownership* , and *financial performance* on *carbon emission disclosure* . According to the research results, (Syava et al., 2025) put forward *Managerial Ownership* negatively impacts *carbon emission disclosure* , as managerial ownership tends to encourage decision-making related to maximizing company profits and has not made carbon emission disclosure a priority in company operations . According to research (Khalimatussa'diah et al., 2023) *Managerial ownership* has a significant positive effect on *carbon emission disclosure* , because the large number of shares owned by managers can increase attention to shareholder interests.

According to research (Amaliyah & Solikhah, 2021) *managerial ownership* does not affect carbon *emission disclosure* , because managerial ownership makes managers tend to pay attention to financial performance to obtain returns on their investments. However , according to (Qonita Avena Zada, 2024) *Managerial ownership* has a significant positive effect on *carbon emission disclosure,* because managers who own shares in the company tend to influence the company to be more open in disclosing carbon emission information and according to research (Wibowo et al., 2022) stated that *managerial ownership* has a significant positive effect on *carbon emission disclosure* , because high managerial ownership will result in managers' opportunistic behavior decreasing and feeling the direct impact of every decision taken.

The results of research conducted by (Reza Virly Alfriansyach & Deni, 2024) stated that *institutional ownership* has an insignificant negative effect because the management of the company prioritizes the interests of majority shareholders over the interests of minority shareholders , a similar finding was put forward by (Angelina & Handoko, 2023) *institutional ownership has a* significant positive effect on *carbon emission disclosure ,* because the size of institutional ownership has an influence on carbon emission disclosure , however

According to (Syava et al., 2025) *Institutional ownership has an* insignificant negative impact on carbon *emission disclosure* , as institutional ownership tends to encourage management performance to maximize company profits. Meanwhile, (Putri et al., 2022) found an insignificant negative impact on carbon *emission disclosure* , as institutional ownership is limited

to investment purposes and does not conduct any subsequent monitoring due to being preoccupied with activities within the institution itself.

Research conducted by Dina Maria Kristari & Akuntansi (2022) found that *financial performance* has *an* insignificant negative effect on *emissions carbon disclosure* , as it *is* considered a burden or reduces resources. Several similar findings were found by researchers (Kelvin et al., 2022). *Financial performance has* a positive but insignificant *effect* on *emissions carbon disclosure* , because not all companies distribute profits to shareholders but companies need funds for reinvestment. (Salsabila & Nurleli, 2025) stated that financial *performance has a* significant positive effect on *carbon emissions disclosure ,* because good financial performance tends to be more effective in disclosing its carbon emissions .

According to (Putri et al., 2022) , *financial performance has a* significant negative relationship *with* carbon *emission disclosure because companies* focus more on generating profits than disclosing carbon emissions. Researchers (Lasmiati, Indra Pahala, 2024) found that in this study, it has an insignificant negative effect on carbon *emission disclosure* because high profits tend to deem it unnecessary to disclose information that could distort perceptions of financial performance. Thus, the three variables still show inconsistent results, opening up opportunities for further research.

The novelty of this research lies in examining the role of managerial *ownership* and institutional *ownership* , which examines topics surrounding evolving and sustainable corporate governance, both in the past and present, that influence *e -mission carbon disclosure* . The urgency of this research is the need for environmental transparency and accountability to improve *e - mission carbon disclosure.* (Deviyola Maharani, 2024) .

2. Preliminaries or Related Work or Literature Review

Agency Theory

Agency theory explains the relationship between company owners and managers. The principal delegates authority, while the agent carries out the actions. Agency theory addresses *principal-agent conflict* by ensuring both parties are goal-oriented . This theory is very important to ensure that the company is well managed, especially regarding *carbon emission disclosure.* (Oktaviani et al., 2024) .

aligning interests between management and shareholders, namely by making management a shareholder of the company (Syava et al., 2025) . *Institutional ownership* also acts as an external oversight that can reduce agency costs and increase company value (Ramadhika, 2023). Good *financial performance* is able to minimize agency costs and provide compensation benefits for both management and shareholders (Martin, 2024) . Agency theory is relevant to *e mission carbon disclosure* because it requires adequate costs and financial support for emission reduction . (Wahyuningrum et al., 2025).

Managerial Ownership

Managerial *ownership* is the company's shares by the manager, meaning the company manager is also a shareholder (Fuad, 2021) . *Managerial ownership is measured by the percentage* of management shares to the total outstanding shares , so that *managerial ownership* according to (Dita, Wahyono, 2025) can be formulated as follows:

$$KM = \frac{\text{Total saham yang dimiliki Manajemen}}{\text{jumlah saham yang beredar}} x\ 100\% \quad \ldots(1)$$

Institutional Ownership

Institutional Ownership Institutional ownership refers to shares owned by institutions or companies , which allows for professional monitoring of management, thereby strengthening control and reducing the potential for fraud (Suwisma, 2023) . *Institutional ownership* strengthens monitoring, suppresses earnings management, and influences financial reports that potentially contain accruals related to management interests (Kartikasari et al., 2022) . *Institutional ownership* is measured by the number of shares owned by an institution relative to outstanding shares. so that according to (Dita, Wahyono, 2025) it can be formulated as follows:

$$KI = \frac{\text{Total saham yang dimiliki Institusional}}{\text{jumlah saham yang beredar}} x100\% \quad \ldots(2)$$

Financial Performance

Financial performance reflects a company's achievements through financial reports as indicators of its financial and operational conditions (Viulina et al., 2023) . Financial ratio analysis is a commonly used method, including liquidity and profitability. which reflects the overall financial condition. This emphasizes the importance of environmental management transparency in enhancing a company's reputation and value (Masyitah & Harahap, 2018) . *Financial Performance* in the company , namely the achievement of good and correct financial management, so that its measurement with *Return on Assets* (ROA) states the effectiveness of the use of company assets in generating net profit (Putri, Krido; 2025) which can be formulated as follows :

$$Return\ On\ Asset = \frac{\text{Laba bersih setelah Pajak}}{\text{Total Aktiva}} x100\% \quad \ldots(3)$$

Carbon emission disclosure

Carbon emission disclosure is a company's effort to record, acknowledge, disclose, and measure the amount of carbon emitted by the organization (Sawitri, 2021) . Carbon emissions, in the context of the environment and science, refer to the process of releasing carbonaceous gases into the atmosphere due to human activities. This gas is released during the combustion of petroleum fuels. and coal (Pangestu & Ayuningsasi, 2024) . *Carbon emission disclosure* is the process of conveying and reporting a company's emissions or organization's activities. environmental responsibility and transparency towards stakeholders (Sukmawati, 2023) .

$$\text{GRI } 305 = \frac{Total\ item\ yang\ di\ ungkapkan}{Ni = 7} \quad \ldots(4)$$

Framework

The framework of thought based on the description that has been explained is:

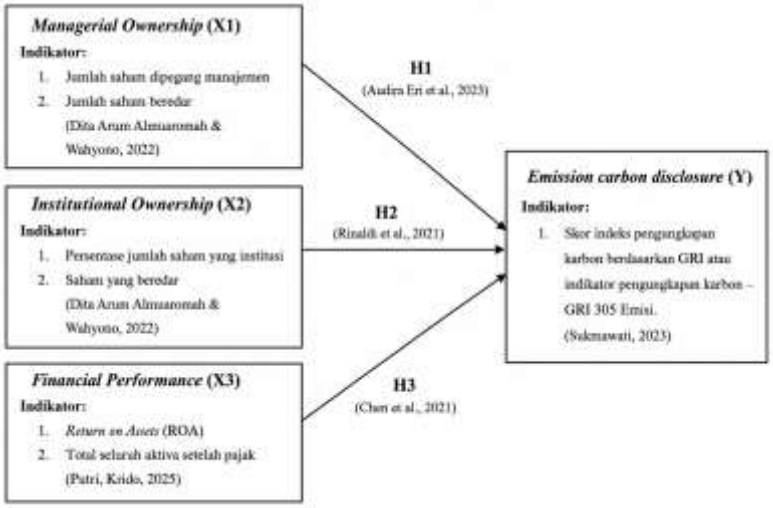

Figure 1. Framework of Thought

Information :

X_1 = *Managerial ownership*

X_2 = *Institutional ownership*

X_3 = *Financial Performance*

Y = *Emission carbon disclosure*

H_1 = Relationship between variable X_1 and Y

H_2 = Relationship between variable X_2 and Y

H_3 = Relationship between variables X_3 and Y

Research Hypothesis

The Influence of Managerial Ownership on Carbon Emission Disclosure

Managerial ownership refers to parties who own shares in management and are also actively involved in decision-making (Khalimatussa'diah et al., 2023) . In decision-making, managerial ownership correlates with agency theory, where managers act as agents entrusted by shareholders to manage the company and maximize company resources to achieve goals (Ramadhika, 2023) . Research (Khalimatussa'diah et al., 2023; Qonita Avena Zada, 2024; Wibowo et al., 2022) suggests that *managerial ownership* has a positive effect on *carbon emission disclosure,* as companies tend to be more open in disclosing carbon emissions.

With this, the hypothesis is as follows:

H1: *Managerial ownership* has an effect on e- *mission carbon disclosure*

The Influence of Institutional Ownership on Carbon Emission Disclosure

Institutional *ownership* refers to the ownership of company shares by a specific institution or agency (Fuad, 2021) . In decision-making, institutional ownership correlates with agency theory, where institutional investors are considered an effective monitoring and control mechanism for managerial decisions. This is because institutional investors participate in strategic decision-making, making them less susceptible to profit manipulation and increasing the efficiency of company asset utilization (Zahro, 2021) . According to research (Angelina & Handoko, 2023), *Institutional ownership has a* significant positive effect on *carbon emission*

disclosure , because the size of institutional ownership has an influence on carbon emission disclosure. Therefore, the following hypothesis is formulated:

H2: Institutional *ownership* has an effect on carbon emission disclosure.

The Influence *of Financial Performance* on *Carbon Emission Disclosure*

Financial performance is an activity carried out by a company to determine the company's financial condition by measuring analysis and producing reports to see the good or bad of the company's financial information (Salsabila & Nurleli, 2025) . In decision-making, *financial performance* is correlated with agency theory due to differences in interests and information and ensures that agents work to maximize profits for the owner, thereby reducing conflict (Martin, 2024) . According to research (Salsabila & Nurleli, 2025) *Financial performance* has a positive effect on *carbon emission disclosure,* as good financial performance tends to be more effective in disclosing carbon emissions. Therefore, the following hypothesis is proposed:

H3: *Financial performance* has an effect on *carbon emission disclosure*

3. Materials And Method

This study uses a quantitative method with secondary data from the population of metal and mineral subsector companies on the Indonesia Stock Exchange (IDX). The sample collection technique was carried out through purposive sampling for the period 2021-2024 with the following criteria: first, the company was listed on the IDX during the research period and second , presented *an annual report* and *sustainability report* . Data analysis used variance-based *regression* through *SmartPLS* version 4.0, which includes classical assumption tests, regression coefficients, hypothesis testing and coefficients of determination.

4. Results And Discussion

Results

The population of this study consisted of 31 companies in the metal and mineral subsector listed on the Indonesia Stock Exchange (IDX) during the period 2021-2024 . The sample was selected using a *purposive sampling method* based on certain criteria. Six companies were excluded because they did not publish complete annual reports and sustainability reports. Thus, 25 companies were obtained as research samples. During the 4- year observation period , a total of 100 observational data samples were used .

No.	Kriteria Sampel	Jumlah
1	Perusahaan subsektor logam & mineral yang terdaftar di BEI	31
2	Perusahaan tidak lengkap dalam pelaporannya (2021–2024)	-6
3	Perusahaan yang lengkap dalam pelaporannya (2021–2024)	25
4	Rentang waktu 4 Tahun (2021–2024)	100

Figure 2. Table List of Research Sample Criteria

(Source: Processed data 2026)

No.	Variabel	Skala	Indikator
1	*Managerial Ownership* (X1)	*Managerial Ownership*	Total saham yang dimiliki manajemen dan total saham yang beredar (Dita Arum Almuaromah & Wahyono, 2022)
2	*Institutional Ownership* (X2)	*Institutional Ownership*	Total saham yang dimiliki institusi/perusahaan dan total saham yang beredar (Dita Arum Almuaromah & Wahyono, 2022)
3	*Financial Performance* (X3)	*Return On Assets*	Total laba tahun berjalan Total assets (Dewi & Cahyono, 2022)
4	*Emission Carbon Disclosure* (Y)	*ECD*	GRI- 305 (Sukmawati, 2023)

Figure 3. Table Measurement of Research Variables

Table 1. Normality Test

Variables	***Excess Kurtosis***	***Skewness***
ECD	-1.111	-0.066

Source: Data processed by researchers (2026)

In the normality test in the table, it is concluded that *The skewness* value is -0.066, which is still within the tolerance limits of the normal distribution (±1), and the *excess kurtosis value is -1.111, which is also still within the tolerance limits of normally distributed data. The following are the results of the Breusch-Pagan* analysis using SmartPLS:

Table 3. *Heterogeneity Testing*

Testing unit	***Test Statistics***	***df***	***P Value***
ECD	2,594	3	0.459

Source: Data processed by researchers (2026)

Based on the results of the heterogeneity test, the results displayed In Table 3 , the *p-value* is 0.459 , which is greater than 0.05 (0.459 > 0.05). This data regression can be concluded to be *homogeneous* and not to have *heteroscedasticity issues* . The next step is the *Collinearity Statistics Test* , which suggests that *the variance inflation factor* value a score below 5 indicates the absence of multicollinearity in mode l .

Table 4. *Collinearity Statistics*

Test Variable	VIF
Managerial Ownership	1,556
Institutional Ownership	1,562
Financial Performance	1,016

Source: Data processed by researchers (2026)

The collinearity statistics test in table 4 states that the variable X1 is 1.556, X2 is 1.562, and X3 is 1.016. The VIF value is below the threshold so that the regression model can be declared free from multicollinearity because the score is below 5 , which indicates that there is no high correlation between the independent variables and is suitable for use in regression analysis. Next is the Multiple Linear Regression test, Hypothesis Testing, and *R Square* . *For hypothesis analysis on hypothesis acceptance, the t-statistics* and *p-value* are based , where the hypothesis

is considered significant if the t value ≥ 1.96 (p ≤ 0.05). Each relationship path between variables is then evaluated to determine whether it has a statistically significant effect on the dependent variable.

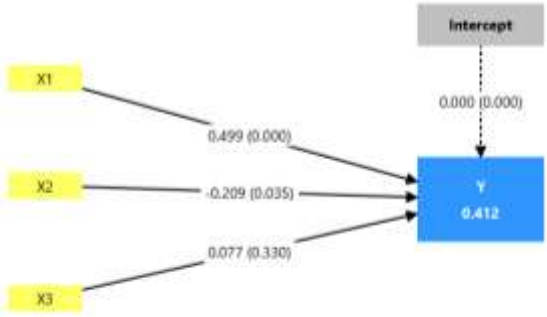

Figure 4. Results of *Regression Analysis, Hypothesis* , and *Termination Coefficient*

The image above is an image generated from the SmartPLS 4 image model where the boxed image (yellow) is the independent variable using the notation X1 (*Managerial Ownership*), X2 (*Institutional Ownership*) and X3 (*Financial Performance*), while the blue image is the dependent variable, namely Y (*Emission carbon disclosure*), each path has a coefficient value along with its significance level. The statistical figures can be clearly explained below:

Table 5. Results of *Regression Analysis, Hypotheses,* and *Termination Coefficients.*

Test Variabel	Unstandardized coefficients	Standardized coefficients	SE	T value	P value	2.5 %	97.5 %	R-Square
Intercept	0.652	0	0.103	6.305	0	0.447	0.858	
Managerial Ownership	0.631	0.499	0.123	5.11	0	0.386	0.876	
Institutional Ownership	-0.287	-0.209	0.134	2.136	0.035	-0.553	-0.02	0.412
Financial Performance	0.32	0.077	0.326	0.98	0.33	-0.328	0.967	

Source: Data processed by researchers (2026)

Based on Table 5, the results of the hypothesis testing can be explained as follows: (1) Based on the results of the relationship between *managerial ownership* , *institutional ownership* , and *financial performance* on the dependent variable (Y), the constant coefficient of 0.652 describes that all independent variables have a value of zero, so the Y value remains at 0.652. (2) Based on the results of the relationship *between managerial ownership* and carbon emission disclosure, the test shows a coefficient value of 0.631 and a p-value of 0.000. < 0.05 , this indicates *managerial ownership* has a significant positive effect on *carbon emission disclosure* . Thus, H1 is accepted. (3) Based on the results of the relationship between *institutional ownership* and carbon emission disclosure, the test shows a coefficient value of -0.287 and a p-value of 0.0 35 < 0.05 , this indicates that *institutional ownership* has a significant negative effect on *carbon*

emission disclosure . Thus, H2 is rejected. (4) Based on the results of the relationship between *financial performance* and *carbon emission disclosure,* the test shows a coefficient value of 0.320 and a p-value of 0.330 > 0.05. , this indicates that *institutional ownership* has a positive but insignificant effect on *carbon emission disclosure* . Thus, H3 is rejected.

Discussion

From the results of data management that has been carried out by researchers, the following discussion has been produced:

The Influence of Managerial Ownership on Carbon Emission Disclosure

Based on the test results, managerial *ownership* has a positive effect on carbon emission disclosure with a coefficient value of 0.631. This effect is statistically significant because the p-value is 0.000 <0.05, so the hypothesis (H1) is declared accepted. This proves that the large number of shares owned by managers is encouraged to be more transparent and compliant in disclosing carbon emissions, thereby improving the company's public perception, especially among investors. From *the Agency Theory perspective,* managerial *ownership* functions to emphasize the potential for conflict between *principals* and *agents* as a mechanism for equalizing understanding so that information flows smoothly without conflict. The results of this study are in line with (Khalimatussa'diah et al., 2023; Qonita Avena Zada, 2024; Wibowo et al., 2022) who state that companies with high managerial shares tend to be more open in disclosing carbon emissions**.**

The Influence of Institutional Ownership on Carbon Emission Disclosure

Based on the test results, institutional *ownership* has a negative effect on carbon emission disclosure with a coefficient value of -0.287. This effect is statistically significant because *the p-value is* 0.000 < 0.05, so the hypothesis (H2) is rejected. This proves that the management of the company prioritizes the company's profits by encouraging management performance for long-term needs. From *the Agency Theory perspective* , where institutions or companies monitor management professionally to strengthen control and reduce the potential for fraud. The results of this study are in line with (Putri et al., 2022; Reza Virly Alfriansyach & Deni, 2024; Syava et al., 2025) who state that institutional shares are only limited to investments and do not carry out supervision because they are busy with activities within their own institutions.

The Influence *of Financial Performance* on *Carbon Emission Disclosure*

Based on the test results, *financial performance* has a positive effect on *carbon emission disclosure* with a coefficient value of 0.320. This effect is not statistically significant because *the p-value is* 0.330 > 0.05. Therefore, hypothesis (H3) is rejected. This proves that companies in the metal and mineral sub-sector are more focused on generating profits and therefore consider it unnecessary to disclose environmental impact information. From *an Agency Theory perspective,* management and shareholders are able to minimize agency costs and provide good compensation benefits. This research aligns with (Kelvin et al., 2022) that not all companies distribute profits to shareholders but require funds for reinvestment.

5. Conclusion

Based on the analysis, it can be concluded that *managerial ownership* has a positive and significant effect on *carbon emission disclosure* , indicating that management ownership encourages increased transparency in carbon emission disclosure. Conversely, *institutional ownership* has a negative and significant effect, indicating that institutional investors tend to be more profit-oriented and therefore less likely to encourage extensive disclosure. Meanwhile, *financial performance* has no significant effect, as companies prioritize financial stability and efficiency over environmental disclosure. As a consequence, companies need to increase their commitment to environmental transparency by focusing not only on financial performance, but also on accountability to stakeholders. Besides that, recommend add other variables to obtain a comprehensive framework related to regulatory pressures, governance characteristics, or other external factors that have the potential to influence the transparency *of carbon emission disclosure* .

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