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The Effect of Carbon Emissions Disclosure on Real Earnings Management with Financial Distress as a Moderating Variable

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Abstract: Using financial distress as a moderating variable, this study sought to ascertain the relationship between a company's actual earnings management procedures and its corporate responsibility in declaring carbon emissions in Indonesia. The company's financial statements reports and sustainability reports are used in this study to evaluate the values of the variables under investigation. The exploratory quantitative technique is used to offer the test findings discussed in this study. Companies in the energy sector sub-industry that are listed on the Indonesia Stock Exchange for the 2019–2023 period make up the research sample. The Purposive Sampling method was employed in the sample determination process. The study's findings demonstrate that actual earnings management procedures are not much impacted by a company's disclosure of carbon emissions. Moreover, the poor financial condition of the company cannot moderate the influence of carbon emission disclosure on real earnings management. The disclosure of carbon emissions by companies is carried out as a manifestation of their responsibility towards the environment and the encouragement from society, particularly stakeholders, to maintain the company's image. The level of financial difficulty of the company is also not a driving factor for companies that disclose good carbon emission reporting to engage in earnings management practices. Companies are more likely to avoid social conflicts and political pressure in their carbon emission disclosure reporting. The presence of government regulations also plays a role, prompting companies to simultaneously prioritize non-financial reporting such as carbon emission disclosures to avoid disciplinary sanctions from the government and social pressure from the community. Companies that are financially struggling tend to not participate in good environmental disclosures, as they are more concerned about the loss of their resources than before. The implications of this research play an important role for stakeholders and the government to pressure companies to avoid earnings management practices and prioritize non-financial reporting such as carbon emission disclosure as a form of social responsibility.

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INTRODUCTION

In creating high-quality financial statements, earnings management practices are often implemented by companies as an effort to achieve their targeted financial reporting quality (Budi & Anggraeni, 2023). Unethical actions taken by management, such as earnings management practices, occur due to pressure from stakeholders (Repousis, 2016). A major issue recently faced by stakeholders is the collapse of large corporations due to financial scandals in financial reporting (Callao et al., 2014). In assessing a company's future performance, the level of profit serves as one of the key indicators used as a measurement tool (Lizińska & Czapiewski, 2023). In assessing the quality of financial statements, earnings management is often used as one of the evaluation metrics by financial statement users, and the issue of earnings management has also been widely discussed over the past two decades (Ali & Kamardin, 2018). There are two types of earnings management practices, the first one is Accrual Earnings Management and the second oen is Real Earnings Management (Roychowdhury, 2006). Accrual Earnings Management is a profit manipulation practice that focuses on accrual accounting policies, such as manipulating profit by shifting the recognition period of expenses and revenues during the reporting process. On the other hand, Real Earnings Management is a profit manipulation practice that focuses on manipulating earnings through financing, operational, and investment activities, by engaging in actions such as manipulating sales, reducing discretionary expenses, and overproduction (Tarus & Korir, 2023). In practice, over the past two decades, the trend in earnings management has shifted from accrual-based methods to real earnings management. This shift has occurred because, for regulators and auditors, real earnings management is considered more complex to detect or identify (Akter et al., 2024), and its implementation is viewed as more effective compared to accrual earnings management (X. Li et al., 2023).

The scandals involving Enron and WorldCom made financial statement users increasingly concerned about the issue of earnings management (Almubarak et al., 2023). Similar to the cases involving companies in Saudi Arabia, previous research has reported the average earnings management for each of them as 17.4%, 7%, 10.3%, and 16.2%, respectively (Al Shetwi, 2020; Al-Thuneibat et al., 2016; Garfatta, 2021; Habbash & Alghamdi, 2017). One of the earnings management phenomena that occurred in recent years is the case of General Electric's business unit, General Electric Power, which operates in the energy sector. In the SEC reports for 2016 and 2017, GE was suspected of manipulating financial data in its business unit, GE Power. The company was criticized for not providing transparent information regarding the profits they reported, which amounted to 1 billion US dollars in 2016 and the revenue for Q3 2017. It was suspected that these profits stemmed from cost-cutting practices. This serves as clear evidence of earnings management actions taken by the company for the benefit of certain parties. The goal, of course, was to present the financial statements in a way that portrayed the company's performance as favorable (Detik Finance, 2020). As a result of its actions, GE was fined 200 million US dollars and agreed to pay the fine. Earnings management practices are a part of the environmental strategy implemented by companies (Velte, 2021). The performance of environmental practices, represented through carbon, refers to the increase in real earnings management (Velte, 2021). Company management uses environmental activities, such as carbon-related activities, as a form of moral responsibility while also hiding their negative impact on financial reporting (Velte, 2021).

Carbon emissions issues have become one of the main concerns impacting the environment and the business strategies of companies (Chithambo & Tauringana, 2014). From the perspective of shareholders and stakeholder groups, the carbon issue urges companies to pay attention to environmental, social, and governance (ESG) matters (Velte, 2021). The issue of carbon emissions disclosure and the quality of financial reporting are closely linked (Lemma et al., 2020). Carbon emissions disclosure has a positive relationship with the company's earnings management practices (Astari, 2020). According to previous research, companies disclose social responsibility to avoid earnings management practices that might influence stakeholder focus (Gavana et al., 2017). Companies that increase their CSR activities are more likely to engage in earnings management (Jordaan et al., 2018). Companies are beginning to adopt socially responsible corporate behaviors and strategies to protect themselves from disciplinary actions and to maintain their reputation and status (Mutuc et al., 2019).

Symbolic management practices are linked to the disclosure of social responsibility, or more specifically, the disclosure of carbon emissions (Hope et al., 2013). High pressure from stakeholders to increase carbon emissions disclosure can influence changes in financial reporting behavior (Velte, 2021). Some studies view this issue as an opportunity to implement in their business strategies (Nuber et al., 2019). The lack of research exploring the relationship between carbon emissions disclosure and earnings management in Indonesia is the foundation of this study.

This research is developed based on previous studies that suggest expanding the research population, especially in Asia-Pacific countries or others outside the United States (Almubarak et al., 2023a; Houqe et al., 2023). Furthermore, research by Habbash & Haddad (2020) suggests using real earnings management assessment methods to uncover diverse findings, as the method used in their research is prone to errors in its calculations. This study attempts to link carbon emissions disclosure with earnings management to determine whether the disclosure of carbon emissions in a company is associated with earnings management practices. Carbon emissions disclosure has the potential to serve as an indicator for detecting earnings management. Previous studies have explored this issue to uncover the relationship between environmental information or specifically carbon emissions disclosure and earnings management (Gerged et al., 2020a; Shang & Chi, 2023). However, empirical findings have not yet reached a conclusive outcome. On one hand, some researchers have concluded that there is a negative correlation between carbon emissions disclosure and earnings management (Bilal et al., 2022; Gerged et al., 2020a; Martínez-Ferrero et al., 2015; Shang & Chi, 2023). On the other hand, other studies have concluded that there is a positive correlation between carbon emissions disclosure and earnings management (Muttakin et al., 2015; Salewski & Zülch, 2014; Velte, 2021). Due to the conflicting results, further research is needed to reconcile the differences found in existing studies (Huda et al., 2021). The approach used in this research involves adding a moderating variable. The moderating variable chosen for this study is the level of financial difficulty.

Financial difficulty occurs when a company's financial performance continues to decline until it reaches bankruptcy or liquidation due to its inability to meet debt obligations (Martin & Indrati, 2024). This study establishes the level of financial difficulty as a moderating variable. The level of financial difficulty is used in this research to test whether its presence strengthens or weakens the effect of carbon emissions disclosure on earnings management. Financial constraints can limit a company's ability to comprehensively report ESG disclosures, which could hinder its ability to gain investor trust and access to capital (Aulia et al., 2023; Dye et al., 2021). Thus, financially troubled companies may have poor environmental responsibility reporting or, more specifically, poor carbon emissions disclosure. However, other studies suggest the opposite. Companies experiencing financial difficulty may tend to increase their ESG disclosures to improve stakeholder perceptions and attract investment, even with limited resources (Almubarak et al., 2023b; Harymawan et al., 2021). This means that companies facing poor financial conditions will likely focus on strong ESG disclosures to divert stakeholders' attention from the financial challenges they are facing. Previous studies suggest that companies in financial difficulty try to enhance their ESG disclosures to signal high performance from the market and financial entities' perspectives (Almubarak et al., 2023a). Therefore, it can be concluded that if a company is in poor financial condition, it may increase or decrease its involvement in comprehensive environmental reporting or, more specifically, carbon emissions disclosure. Based on the previous paragraph about the relationship between carbon emissions disclosure and earnings management, a similar pattern can be concluded. That is, there is potential for a company to engage in or avoid earnings management practices. The relationship and inconsistency between the moderating variable and independent variables and the independent and dependent variables form the basis for this research, supported by the signaling theory framework.

This study will provide both theoretical and practical contributions. Theoretically, this study can serve as an additional reference on the issue of carbon emissions disclosure, earnings management, and financial difficulty within the signaling theory framework. This research also seeks to contribute to the lack of similar studies conducted in Indonesia. Practically, this study is expected to be used by stakeholders to minimize earnings management practices and serve as a decision-making resource.

LITERATURE REVIEW

Signaling Theory

In signaling theory, information asymmetry refers to the disparity in the quality and quantity of data between a company's internal and external entities (Spence, 1973). In developing signaling theory, external control over the company's financial reporting becomes important, as management possesses better information. The information or signals must be accurately conveyed to external parties to avoid information gaps (Ross, 1977). Such gaps can create uncertainty and negatively impact the company's image (Irwandi et al., 2019). Signaling theory emphasizes the importance of the information disclosed by management, as it can influence external parties' investment decisions and is crucial in maintaining the company's positive image (Narsa et al., 2023). Thus, signaling theory in the context of this study can explain the relationship between carbon emissions disclosure and the company's earnings management practices. Companies that disclose carbon emissions are indirectly sending signals regarding their potential involvement in earnings management. This may occur because a company's disclosure of corporate social responsibility (CSR) can lead to increased stakeholder support or acceptance, as good CSR reporting may shift stakeholder attention away from indications of earnings management practices by the company's management (Rankin et al., 2011).

Earnings management

The decision made by company management to choose certain accounting policies with the aim of achieving a desired profit level is commonly known as earnings management (Bui et al., 2020). Earnings management practices have a significant impact on society because they play a critical role in the reliability of financial statements and balance sheets, directly affecting investors, the stock market, creditors, and financial institutions (Teixeira & Rodrigues, 2022). Disclosure and earnings quality are vital in the corporate sector, but the presence of earnings management can undermine both. Without earnings management, earnings quality would be more transparent. However, profit manipulation by managers, even if in accordance with applicable regulations, can disrupt the stability and predictability of earnings, thereby reducing their usefulness in decision-making (Sun & Al Farooque, 2018).

Earnings management can be divided into two methods. The first is accrual earnings management, which involves modifying or manipulating accrual components in the financial statements (Majid et al., 2020). Accruals are often chosen because they tend to be easier to manipulate for personal gain. The second method is real earnings management, which involves manipulating profit levels through the company's operational activities. This study focuses on real earnings management because, over the past two decades, it has become the more commonly used method, as it tends to be more complex and difficult for auditors and regulators to detect (Akter et al., 2024).

There are three commonly used real earnings management practices by company management (Roychowdhury, 2006). These include manipulating or engineering sales, reducing discretionary expenses, and overproduction. Real earnings management is measured using three proxies: abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses (Uddin, 2023).

Cabon Emissions Disclosure

Carbon emissions are essentially defined as the release of carbon-containing gases into the Earth's atmosphere (Kelvin et al., 2017). Sustainability reports, as part of a company's annual reporting, are generally used to disclose carbon emissions (Emmanuel et al., 2023). In response to pressure from various stakeholders, companies disclose annual carbon emissions information through their sustainability reports (Depoers et al., 2016). One form of corporate responsibility to society is the disclosure of carbon emissions, which serves as a company's way of acknowledging its contribution to climate change (Astari, 2020). Companies demonstrate their corporate social responsibility (CSR) with the aim of being perceived as environmentally friendly entities and to gain support from their stakeholders. Ultimately, stakeholders may shift their focus from earnings management issues to the company's strong CSR performance (Rankin et

al., 2011). Thus, in line with signaling theory, companies with strong social responsibility performance may indirectly signal the presence of earnings management practices.

The study by Almubarak et al. (2023b) concludes that companies with high ESG scores are more likely to engage in earnings management. This statement is supported by Habbash & Haddad (2020), who argue that companies involved in earnings management may attempt to shield themselves from detection by disclosing more favorable CSR components. Similarly, Muttakin et al. (2015) found that managers in developing economies tend to use discretionary accruals to manage earnings while increasing CSR disclosure. In agreement with previous studies, Astari (2020) also explained that there is a positive relationship between carbon emissions disclosure and the company's earnings management practices. Companies may use social responsibility disclosures to obscure their earnings management activities and avoid scrutiny from stakeholders (Gavana et al., 2017). The conclusions drawn from these prior studies align with signaling theory, which suggests that managers or companies strive to present a strong social performance to signal to investors that they have built an environmentally responsible company. However, on the other hand, strong environmental disclosures can also serve as a signal that earnings management practices may be taking place.

H1: Carbon emissions disclosure has a positive influence on the company's real earnings management practices

Moderating Role of Financial Distress

When a company faces financial distress, its earnings may not meet investor expectations. To improve stakeholder perception and potentially attract investment, even with limited resources, financially distressed companies tend to increase their ESG disclosures (Almubarak et al., 2023b; Harymawan et al., 2021). Consequently, such companies are more likely to disclose environmental reports—or more specifically, carbon emissions disclosures—in a more favorable and detailed manner. This suggests that the greater the financial distress, the higher the company's involvement in environmental disclosure. Previous studies have also established a correlation between environmental disclosure—particularly carbon emissions—and earnings management, concluding that companies with good environmental reporting tend to have a greater tendency to engage in earnings management practices (Muttakin et al., 2015; Salewski & Zülch, 2014; Velte, 2021). Therefore, companies under financial strain may disclose carbon emissions thoroughly as a signaling mechanism, while at the same time engaging in earnings management. This conclusion is supported by earlier research showing that financial distress positively and significantly moderates the relationship between ESG disclosure and earnings management (Almubarak et al., 2023b). In line with the signaling theory framework adopted in this study, companies will attempt to display strong corporate social responsibility performance to signal overall positive performance to stakeholders, though this may also indicate the presence of earnings management practices.

H2: Financial distress can moderate the effect of carbon emissions disclosure on the company's real earnings management practices.

METHODS

Research Design

An exploratory quantitative approach is applied in this study to present the results of testing samples from companies that will be analyzed. The research population consists of companies listed on the Indonesia Stock Exchange from 2019 to 2023. The sample used for the research is companies in the energy sector, selected through purposive sampling. The energy subsector is chosen because, according to data from the Central Statistics Agency of Indonesia, the largest contributor to carbon emissions is the electricity and gas procurement subsector. This subsector contributes 50% of the total carbon emissions from all industries in Indonesia each year. Based on data from the Ministry of Energy and Mineral Resources

(ESDM), in 2018 alone, the electricity and gas procurement subsector accounted for 46.35% of emissions. Therefore, the companies used in this study are those closely related to carbon emissions disclosure.

Table 1. Purposive Sampling

Description	Total
Energy subsector companies listed on the IDX	87
Energy sector companies that do not report complete sustainability reports for the period 2019-2023	(69)
Research sample	18
Total research sample (18*5)	90

Operational Definition and Measurement of Variables

Carbon Emissions Disclosure

Carbon Emissions Disclosure is one of several environmental disclosure components categorized as a form of information delivery regarding the company's environmental responsibility where the company's business operations take place. Generally, such disclosures are made by companies in their annual reports or sustainability reports (Akhiroh et al., 2016; Harymawan et al., 2021). In this study, the carbon emissions disclosure of companies is measured using the Carbon Emission Disclosure Checklist proposed by Choe et al. (2013). The study outlines five categories related to climate change and carbon emissions. These categories include climate change risks and opportunities (CC), greenhouse gas emissions accounting (GHG), energy consumption accounting (EC), greenhouse gas reduction (RC), and cost and carbon emission accountability (ACC). If a company discloses a category of carbon emissions, it will be scored as 1, and if not, it will be scored as 0. These five indicators are explained as follows:

Table 2. Checklist Carbon Emission Disclosure

1- Climate change: risks and opportunities	CC1 – Assessment or explanation regarding the risks (Physical, Regulatory, or General) that are relevant and related to climate change, as well as the actions that have been or are planned to be implemented to manage those risks.
	CC2 – Assessment or explanation regarding the existence of financial implications (current and future), business implications, and opportunities related to climate change.
2 – GHG emissions accounting	GHG1 – A description explaining the methodology applied in the measurement or calculation of the amount of Greenhouse Gas Emissions (e.g., GHG Protocol or ISO).
	GHG2 – The existence of an external verification statement regarding the amount of greenhouse gas (GHG) emissions. If such a statement exists, it should include who issued the statement and the basis on which it was made.
	GHG3 – Total greenhouse gas (GHG) emissions – measured in metric tons of CO2-e produced by the company.

	GHG4 – Disclosure of Direct Greenhouse Gas (GHG) Emissions for Scope 1 and 2, or Scope 3.
	GHG5 – The disclosure of greenhouse gas (GHG) emissions based on sources (e.g., coal, electricity, etc.).
	GHG6 – Disclosure of greenhouse gas (GHG) emissions based on facilities or segment levels.
	GHG7 – Comparison of greenhouse gas (GHG) emissions with previous years.
3 – Energy consumption Accounting	EC1 – Total energy consumed (e.g., terajoules or petajoules).
	EC2 – Quantification of energy used from renewable sources.
	EC3 – Disclosure based on type, facility, or segment.
4 – GHG reduction and cost	RC1 – Details of plans or strategies to reduce greenhouse gas (GHG) emissions.
	RC2 – Specification of greenhouse gas (GHG) emission reduction target levels and target year.
	RC3 – Emission reductions and associated costs or savings achieved to date as a result of reduction plans.
	RC4 – Future emission costs accounted for in capital expenditure planning.
5 – Carbon emission Accountability	ACC1 – Indication of which board committee (or other executive body) has overall responsibility for climate change-related actions.
	ACC2 – Description of the mechanisms used by the board (or other executive body) to review the company's progress on climate change.

Real Earnings Management

Real earnings management is a manipulation practice carried out by managers using operational activities such as manipulating sales, reducing discretionary expenses, and overproduction (Roychowdhury, 2006). Real earnings management is measured using a formula that focuses on abnormal operating cash flows (Roychowdhury, 2006). The following is the calculation used to determine the level of a company's real earnings management:

1. Abnormal Cash Flow Operation

$$CFO_{it}/ASSET_{it-1} = \beta_0 + \beta_1 (1/ASSET_{it-1}) + \beta_2 (SALES_{it}/ASSET_{it-1}) + \beta_3 (\Delta SALES_{it}/ASSET_{it-1}) + e_{it}$$

2. Abnormal Production Costs

$$PRODit/ASSET_{it-1} = \beta_0 + \beta_1 (1/ASSETit\text{-}1) + \beta2 (SALESit/ASSETit\text{-}1) + \beta3 (\Delta SALESit/ASSET_{it-1}) + \beta4 (\Delta SALESit\text{-}1/ASSET_{it-1}) + e_{it}$$

3. Abnormal Discretionary Expenses

$$DISC\ expensit/ASSETit\text{-}1 = \beta_0 + \beta_1 (1/ASSET_{it-1}) + \beta2 (SALESit\text{-}1/ASSETit\text{-}1) + e_{it}$$

Real Earnings Management Formula (REM) = ACFO – APROD + ADISEXP

CFO_{it}	=	Cash flow from operating activities of a company in year t
$ASSET_{it-1}$	=	Total assets of a company in the previous year
$SALES_{it}$	=	Sales of a company in year t
$\Delta SALES_{it}$	=	Sales of a company in year t minus the previous year
$PROD_{it}$	=	Production costs of a company in year t, i.e., Cost of Goods Sold (COGS) – Inventory
$\Delta SALES_{it-1}$	=	Sales of a company in the previous year minus two years prior
$DISCexpens_{it}$	=	Discretionary expenses of a company in year t
$SALES_{it-1}$	=	Sales of a company in the previous year
REM	=	Aggregate value of the three equations to measure overall Real Earnings Management (REM)
ACFO	=	Abnormal operating cash flows calculated using equation (1)
APROD	=	Abnormal production costs calculated using equation (2)
ADIEXP	=	Abnormal discretionary expenses calculated using equation (3)

Financial Distress Level

A company's level of financial distress can also be indicated when its cash flow is insufficient to cover existing debt, or when current assets and current liabilities are not balanced (Li et al., 2020). The level of financial distress is measured using the Altman Z-Score model. The following is the calculation used to determine a company's Financial Distress Level.

Altman Z-Score = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E

A = Working Capital/Total asset
B = Retained Earning/Total asset
C = EBIT/Total asset
D = Market value of equity/Total Liabilities
E = Sales/Total asset

Research Data Analysis

The normality test is the first step in determining whether the data distribution is normal. The Kolmogorov-Smirnov method is used to test for significance. If the significance value is greater than 0.05, the data is considered to be normally distributed. Heteroscedasticity testing is applied in this study with the primary goal of detecting whether there are differences in the residual variance across observations in the regression model. This test uses a scatterplot diagram, where if the points in the diagram are spread evenly and do not form a specific pattern, then heteroscedasticity is not present. The autocorrelation test is used to detect correlations between independent variables and time changes. If the significance value is > 0.05, it can be concluded that there is no correlation between the independent variables. If autocorrelation is present, the solution is to apply the Cochrane-Orcutt method to address the autocorrelation issue (Adrianto et al., 2022). The data analysis technique and hypothesis testing in this study use Moderated Regression Analysis (MRA) based on the methodology described by Ghozali (2021). This approach is used to maintain the integrity of the sample and control the effects of the moderator variable. The MRA test is conducted using the following formula:

$REM=\alpha+\beta_1 KARB+\varepsilon$ .....(1)

$REM=\alpha+\beta1KARB+\beta2TKEU+\varepsilon$ .....(2)

$REM=\alpha+\beta1KARB+\beta2TKEU+\beta3KARB*TKEU+\varepsilon$ .....(3)

In model (1), it is the model used to test the effect of the independent variable, carbon emission disclosure, on earnings management. This model is tested through partial analysis (partial test) using the t-test to test H1. Models (2) and (3) are models used to test the moderation effect, involving how the financial distress variable moderates the relationship between carbon emission disclosure and real earnings management.

RESULT AND DISCUSSION

In Table 3 below, the results of the descriptive statistical analysis of the research data are presented to understand the characteristics of the data being tested in this study.

Table 3. Statistic Description

	Earnings Management	Carbon Emissions Disclosure	Financial Distress Level
Mean	-0.71	0.44	2.01
Median	-0.66	0.56	1.99
Std. Deviation	0.24	0.22	2.77
Variance	0.05	0.05	7.72
Minimum	-1.39	0	-6.16
Maximum	-0.39	0.78	11.59

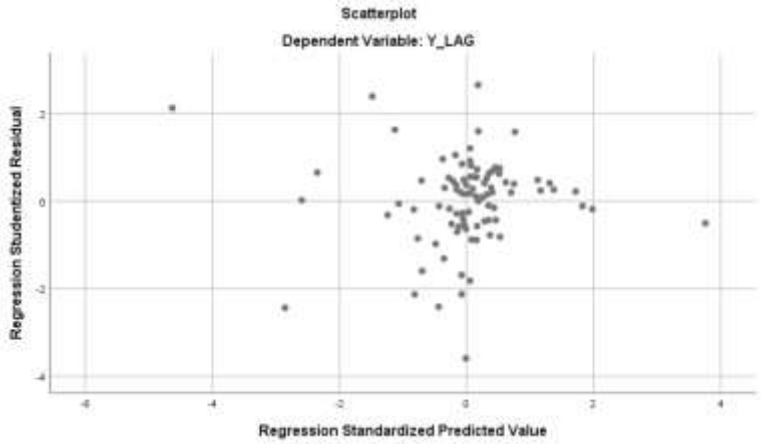
The results of the descriptive test in Table 3 show the data distribution for each research variable. The carbon emission disclosure variable has a minimum value of 0, indicating that there are companies that do not disclose carbon emission issues, and a maximum value of 0.78 with an average of 0.56. This means that, based on the data, no company has fully disclosed carbon emissions according to the checklist. The financial distress variable has a maximum value of 11.59—based on the Altman Z-Score, this indicates companies that are not financially distressed (above 2.9)—and a minimum value of -6.16, which shows severe financial difficulty. The average Z-Score is 2.01, placing most companies in the grey area, or at risk. The real earnings management variable ranges from -1.39 to -0.39, with an average value of -0.71.

Table 4. Normality Test Result For Kolmogorov-Smirnov Method

		Unstandardized Residual
N		89
Normal Parameters[a,b]	Mean	0.0000000
	Std. Deviation	0.19279121
Most Extreme Differences	Absolute	0.088
	Positive	0.087
	Negative	-0.088
Test Statistic		0.088
Asymp. Sig. (2-tailed)		.088[c]

a. Test distribution is Normal.

The data can be categorized as normally distributed if the Asymp. Sig. (2-tailed) value exceeds the predetermined threshold of 0.05. Based on Table 4, it can be concluded that the data is classified as having a normal distribution, or that the regression model meets the normality assumption, since the significance level is 0.088 (>0.05).



Picture 1. Heteroscedasticity Test Result for Scatterplot

The heteroscedasticity test aims to detect differences in the residual variances across observations in the regression model. A pattern of data that does not exhibit symptoms of heteroscedasticity is one where the data points are not evenly dispersed. In the figure, it is evident that the data is evenly spread, allowing the conclusion that the data in this study does not fall into the category of data with heteroscedasticity symptoms. The Durbin-Watson (d) value is 1.999, which is then compared with dU (1.7026) and dL (1.6119) obtained from the Durbin-Watson table with k = 2 and n = 90. The test result shows that the value falls within the range of dU < d < 4 - dU, or 1.7026 < 2.012 < 2.2974. This indicates that the data used in this study does not exhibit signs of either positive or negative autocorrelation. If autocorrelation occurs in the raw data of the study, one possible cause is that all observations are interrelated (Nihayah, 2019).

Table 5. Result for Moderated Regression Analysis

Model	Sig.	Conclussion
(Constant)	0.000	
X_LAG	0.542	H1 Rejected
XZ	0.306	H2 Rejected

a. Dependent Variable: Y_LAG

Based on Table 5 above, the significance value of carbon emission disclosure on earnings management is 0.542 (greater than 0.05). Therefore, since the significance level exceeds 0.05, it can be concluded that the carbon emission disclosure variable does not have a significant relationship or effect on earnings management. It can also be seen in the table that the significance value of Carbon Emission Disclosure on Earnings Management when moderated by Financial Distress is 0.306 (>0.05). Because the significance level in the multiple linear regression results exceeds the threshold of 0.05, Financial Distress is concluded to have no ability to moderate the relationship between Carbon Emission Disclosure and Earnings Management.

Based on the test results, companies that disclose carbon emissions cannot be guaranteed to be engaging in real earnings management practices, especially in the energy sector. Thus, the test results reject the first hypothesis, which states, "Carbon emission disclosure has a positive effect on real earnings management." In the context of signaling theory, this means that companies actively reporting their carbon emissions cannot necessarily signal to stakeholders whether they are engaging in earnings management practices. This research finding is supported by several previous studies that also reached similar conclusions, collectively agreeing that environmental disclosures — or more specifically, carbon emission disclosures — do not have a significant influence on earnings management (Bilal et al., 2022; Gerged et al., 2020a; Martínez-Ferrero et al., 2015; Rezaee & Tuo, 2019; Shang & Chi, 2023).

Companies with strong CSR performance tend to avoid engaging in earnings management (Scholtens & Kang, 2013). Large companies are also less likely to commit earnings management than smaller firms (Scholtens & Kang, 2013). This similarity may be due to the sample companies being located in Asia. Therefore, the conclusion is that companies in Asia that disclose carbon emissions are not necessarily involved in earnings management. However, this study contradicts the conclusion presented by Almubarak et al. (2023a), who stated that the adoption of ESG activities may worsen managerial problems. Managers may manipulate earnings to conceal their self-serving actions from stakeholders and use additional disclosures as a distraction.

Referencing Gerged et al. (2020b), companies that are environmentally responsible tend to avoid earnings management. Gerged et al. also added that managers in Kuwaiti firms use carbon emission disclosure as a tool to reduce the company's exposure to political and social pressure. From the perspective of Indonesian companies, environmental reporting is driven by government initiatives to reduce emissions through green investment under the Carbon Economic Value (NEK) as regulated in Presidential Regulation (Perpres) No. 98 of 2021. Hence, disclosing carbon emissions is not a cover-up for fraudulent behavior. Companies that provide high-quality financial information tend to act more conservatively and ethically. Their accrual quality is better, and they avoid unethical actions like earnings management. These companies are more socially responsible and often contribute philanthropically for public benefit (Martínez-Ferrero et al., 2015). Environmentally friendly companies disclose verifiable environmental information to distinguish themselves from others, enhancing their credibility (Shang & Chi, 2023).

Today's management tends to prioritize short-term gains, but over time, they may shift toward long-term interests. Good management promotes long-term value and avoids short-sighted decisions (Andreou et al., 2016; Yung & Chen, 2018). Although environmental responsibility may impact short-term business performance, it leads to wiser decisions and long-term benefits. Thus, companies choose to report environmental responsibilities, especially carbon emissions, to gain long-term benefits — even under short-term political and social pressure (Gerged et al., 2020b). According to reputation theory, a good reputation can positively impact a company's future (Shang & Chi, 2023). A strong reputation is built through environmental disclosure, which boosts long-term performance and firm value (Graham et al., 2013). Therefore, companies disclosing carbon emissions are not necessarily involved in earnings management.

Galán-Valdivieso et al. (2019) argued that carbon emission disclosure signals a company's commitment to a greener future, earning them social approval. Moreover, companies that disclose carbon emissions are more likely to attract institutional ownership (Krishnamurti & Velayutham, 2018). Engaging in responsible social activities limits earnings manipulation, maintains a positive stakeholder image, and ensures high-quality financial reports (Krishnamurti & Velayutham, 2018). Hence, the motive for carbon emission disclosure could be environmental concern, social acceptance, or attracting institutional investors.

This study also rejects the second hypothesis: "Financial distress moderates the effect of carbon emission disclosure on real earnings management." This means financial distress does not significantly moderate the relationship between carbon emission disclosure and earnings management. The results show that earnings management is not necessarily practiced by companies disclosing carbon emissions during financial distress. However, this contradicts the findings of Almubarak et al. (2023a), who stated that financially distressed companies tend to improve ESG disclosures to mask earnings management. Previous studies have shown that financially distressed firms are less likely to engage in earnings management

(Habib et al., 2013; Rachel Muljono & Sung Suk, 2018; Ranjbar & Amanollahi, 2018). Thus, disclosing carbon emissions during financial distress is not a sign of masking earnings management.

Mutuc et al. (2019) explained that socially responsible corporate strategies are a way to protect companies from disciplinary action and maintain reputation. Velte (2021) added that carbon disclosures are often symbolic and aligned with greenwashing practices. Although high economic instability is positively related to accrual-based earnings management, this does not apply to real earnings management (Junior et al., 2019). Indonesian firms in financial distress are even less likely to report quality ESG disclosures (Harymawan et al., 2021). This means environmental responsibility, including carbon disclosures, is not fully and transparently reported. Financial hardship doesn't push companies to hide their poor condition by maximizing carbon disclosure. Low participation may stem from limited resources (Dang & Tran, 2021; Y. Li et al., 2020). Companies may also fear losing more resources by fully committing to social responsibility (Revelli & Viviani, 2015). Company size also affects earnings management (Habbash & Haddad, 2020). Large firms face more pressure from investors to present predictable financial conditions, which can lead to earnings management. Smaller companies face less pressure. Thus, the characteristics of companies in this study — which are not from developed countries — may be a factor. Indonesian companies may not be large enough to experience intense investor pressure, which lowers the likelihood of earnings management compared to larger firms in developed countries.

CONCLUSION

This study shows that corporate carbon emission disclosure cannot indicate real earnings management practices, especially in the energy sector. Therefore, the first hypothesis, which states that carbon emission disclosure has a positive influence on earnings management practices, is concluded to be not accepted or rejected. This disclosure more accurately reflects a company's responsibility toward the environment and its efforts to support national agendas on emission reduction, such as the Presidential Regulation Number 98 of 2021. These activities show that companies are more focused on long-term benefits rather than short-term risky goals, and thus are not indicators of earnings manipulation.

Furthermore, the company's financial distress level does not moderate the relationship between carbon emission disclosure and real earnings management practices, meaning the second hypothesis is also rejected. Companies that actively disclose carbon emissions, even in times of financial hardship, do not necessarily engage in earnings management. These steps are more likely a strategy to build reputation and maintain accountability so that the company's image is accepted by the public and market. Therefore, carbon emission disclosure serves more as a symbol of social and environmental responsibility rather than a tool to conceal manipulative actions. Moreover, companies experiencing financial difficulty also tend to not be actively involved in environmental responsibility reporting such as carbon emission disclosure. Thus, financial distress and carbon disclosure do not automatically indicate earnings management.

One limitation of this study is the lack of consideration of company size, which might influence the results, as larger firms or those with more public impact could respond differently. Additionally, the study population was limited to energy companies, which may affect the generalizability of the findings. Future researchers are encouraged to consider these limitations to produce more comprehensive results. Hopefully, this study can serve as a reference for financial report users and market observers in evaluating a company not only based on financial information but also non-financial disclosures such as carbon reporting. Furthermore, stakeholders such as shareholders and the government should place more pressure on companies in Indonesia to be more responsible for their environmental impacts, especially carbon emissions.

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