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EARNINGS MANAGEMENT AND CARBON EMISSION DISCLOSURE: THE MODERATING EFFECT OF GOVERNANCE MECHANISMS IN INDONESIAN CORPORATIONS

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ABSTRACT

Introduction: *This study investigates the influence that profit management has on the disclosure of carbon emissions, with a particular focus on the moderating function that corporate governance measures have. The number of board members, the proportion of independent commissioners, and the number of times the audit committee meets are all examples of these parameters. The research addresses the growing demand for transparency in corporate environmental performance, especially in industries with high environmental impact.*

Methods: *The study uses Moderated Regression Analysis (MRA) on 80 observations collected from Indonesian industrial companies during 2017–2021. Key variables analyzed include earnings management, capital expenditure, and corporate governance indicators. Descriptive statistics were conducted to identify variation, followed by F-tests, T-tests, and R^2 tests to evaluate the significance and strength of each variable's effect.*

Results: *The analysis reveals that earnings management does not significantly affect carbon emission disclosure, implying a limited influence of financial manipulation on environmental reporting. In contrast, It has been shown that there is a significant positive association between carbon disclosure and capital expenditure. The only element of corporate governance that substantially impacts the link between carbon disclosure and profitability management is the size of the board of directors for the company. Even though the percentage of independent commissioners and the frequency of audit committees do not greatly regulate the situation, they do significantly impact the link between carbon disclosure and capital spending. Based on these facts, the fundamental function of government, rather than its structure alone, is key to improving environmental accountability.*

INTRODUCTION

Climate change has become a global threat triggered by the accumulation of greenhouse gases in the atmosphere. The latest report from the WMO notes that the concentrations of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) have continued to rise significantly, reaching 420 ppm, 1,934 ppb, and 336.9 ppb, respectively in 2023—equivalent to more than 150% of pre-industrial levels ("State Glob. Clim. 2023," 2024). The growth of economic activity has led to an increase in greenhouse gas emissions, which in turn drives the rise in the Earth's surface temperature. Efforts to reduce these impacts are not solely the responsibility of the government, but also require active participation from corporations. The industrial sector is under particular scrutiny due to its significant role as a major contributor to emissions. ("State Glob. Clim. 2023," 2024)

Indonesia has ratified and supported the Paris Agreement as a commitment to mitigating carbon emissions, further solidified by Presidential Regulation Number 98 of 2021(Peraturan Presiden Republik Indonesia, 2021) on Carbon Economic Value. This policy encourages the implementation of market mechanisms that treat emissions as a cost, thereby pushing companies to reduce their carbon footprint. In this context, emissions reporting serves as a tool to monitor progress toward national targets. Public enterprises are required to synchronize their operational strategy and reports with the government's policy direction. ("State Glob. Clim. 2023," 2024).

Carbon emission disclosure serves as a form of corporate accountability for the environmental impact caused by a company's operations. In Indonesia, this practice is still voluntary, resulting in varying amounts and levels of detail in the information disclosed by different companies. (Nuzulul, 2022). Providing emissions data is seen as a strategic step to anticipate potential regulatory burdens in the future and to maintain the company's reputation. Moreover, transparency in environmental aspects is a crucial reference to assist investors and other stakeholders in decision-making. (Nuzulul, 2022). This highlights a strong connection between emission reporting policies and the market's demand for information.

The execution of the carbon economic value policy mandates that enterprises not only report emissions publicly but also guarantee the integrity of the released information. Nevertheless, in reality, the prospect of manipulation via earnings management continues to be a challenge that has the potential to affect the integrity of emissions reporting. Within this context, corporate governance plays a significant part in ensuring that the integrity of reporting is maintained, particularly via the oversight functions performed by the board of commissioners and the audit committee. (Khuong et al., 2022). A strong governance structure can curb managers' opportunistic behavior and ensure that emissions reporting is conducted objectively and responsibly. (Prior et al., 2008). Thus, corporate governance serves as a reinforcement mechanism, ensuring that companies not only comply with regulations but also maintain public trust in their environmental commitments.

Agency theory elucidates that conflicts of interest between owners (principals) and managers (agents) may incite opportunistic conduct, such as earnings management, which negatively affects the quality of information reported by companies, including carbon emissions disclosures. (The Investopedia Team, 2024). In this setting, corporate governance serves as an essential control mechanism to oversee management activities and align the interests of both parties. The inclusion of independent board members and an audit committee is vital to maintaining accountability and openness in reporting. A study by (Nguyen Vinh Khuong, Vu Tran Trong Tai, Nguyen Thi Phuong Thao, Pham Minh Tuan, Tran Tuan Dung, 2024) discovered that robust corporate governance mechanisms—such as board size, the inclusion of independent members, and frequent board meetings—can alleviate the effects of profits management on carbon disclosure, while simultaneously improving the trustworthiness of the information presented.

In the context of corporate governance, an oversight framework is established via the use of ownership structures, audit committees, and boards of commissioners. The findings of an empirical study conducted in Indonesia indicate that strong governance has the potential to reduce the influence of profitability management on the disclosure of carbon energy emissions. (Devyanti et al., 2024) Research has found that the presence of independent commissioners, audit committees, and gender diversity significantly enhances the transparency of carbon emission disclosures. Furthermore, Pangestu & Hati, 2024 The study showed that the "commissioner" positively influences the degree of carbon emissions disclosure by firms. The existence of these independent supervisors clearly enhances report quality and mitigates manipulative conduct. This highlights the need of merging environmental policy with governance practices. This research seeks to investigate the influence of corporate governance on the link between earnings management and carbon emission disclosure in Indonesian firms.

LITERATURE REVIEW

Agency Theory

Agency theory elucidates the interaction between business proprietors and the individuals managing the company's operations in scenarios where ownership and management are distinct. In some cases, the owners assign the management of the business to professional managers responsible for everyday operations. (Boučková, 2015). This section aims to enhance the company's efficiency and profitability via the use of professional expertise. However, differences in interests between owners and agents may lead to conflicts, requiring oversight mechanisms to protect the owners' interests. (Hamdani, 2016; Sutedi, 2011)

Carbon Emission Disclosure

Greenhouse gas emissions, commonly referred to as carbon emissions, are generally measured based on carbon dioxide (CO_2) concentrations, as CO_2 is the primary component contributing to global warming. (Yendrawati & Asy'ari, 2017). The rise in CO_2 emissions from industrial activities and the use of fossil fuels is a major driver of the current global climate crisis. In response to this difficulty, the idea of carbon accounting has arisen, governing the identification, measurement, recording, and reporting of carbon emissions as a facet of corporate environmental responsibility (Irwhantoko & Basuki, 2016).

Carbon emission disclosure is a component of a company's external reporting, presented through annual reports or sustainability reports, as a form of accountability for the environmental impact of its operations. (Bae Choi et al., 2013; Yendrawati & Asy'ari, 2017). This information assists stakeholders—including investors and regulators—in evaluating company performance and supporting emission control policies. (Liao et al., 2015). Therefore, carbon emission disclosure not only enhances transparency but also plays an essential role in reducing information asymmetry and enhancing corporate accountability. (Hidayanti & Sunyoto, 2012).

The evaluation of the carbon emission disclosure variable is carried out by assigning scores to each of the carbon emission disclosure criteria that are stated by (Bae Choi et al., 2013). The total number of points is 18, with a minimum score of 0 and 18 is the highest possible score. In general, the disclosure of carbon emissions by corporations comprises four basic domains: hazards and possibilities associated with climate change, accounting for emissions of greenhouse gases, energy use, and responsibility. Companies must disclose risks and financial implications related to climate change, methods for calculating emissions, and the status of external verification. They are required to disclose total greenhouse gas emissions, including scope 1, 2, and 3, along with emission sources and comparisons to previous years. Energy-related disclosures include overall use, renewable usage, reduction initiatives, and future objectives. Ultimately, accountability necessitates the identification of accountable committees and monitoring mechanisms for climate-related programs. (Bae Choi et al., 2013).

Corpotare Governance

Corporate governance is a framework used by organizations to organize and supervise their activities to achieve corporate goals and augment company value (Gultom & Ahmar, 2016). To ensure optimal functionality of this system, firms must adhere to the principles of Good Corporate Governance, which include accountability, transparency, responsibility, equity, and autonomy (Arijanto, 2014). These principles aim to limit personal conflicts of interest and prevent irregularities in decision-making. (Larastomo et al., 2016).

Moreover, corporate governance functions as a monitoring system to guarantee that the corporation adheres to stakeholder expectations. This method mitigates possible manipulation in operational operations and fosters the sustained augmentation of corporate value. (Yendrawati & Asy'ari, 2017). Therefore, corporate governance can be understood as an internal control tool that directs management to act in accordance with sound governance principles and prioritize corporate interests over individual ones.

1. Board of Commissioners

The board of commissioners serves as the primary internal control mechanism inside a corporation. It is responsible for management decisions, including corporate disclosure. (Daleski, 2009). The size of the board of commissioners is determined by the number of its members within the examined firm. (Yendrawati & Asy'ari, 2017).

2. Independent commissioners

Independent commissioners serve as advisors and provide strategic input. They assess and provide direction on company strategy, risk management, conflict resolution, and monitor communication effectiveness. (Power & Independen, 2016). This variable is quantified by dividing the count of independent commissioners by the overall count of commissioners. (Yendrawati & Asy'ari, 2017).

$$COMMIND = \frac{Number\ of\ Independent\ Commissioners}{Total\ Commissioners} \times 100\%$$

3. Audit committee meeting

The audit committee meeting frequency is measured by how many times the audit committee meets in a year. (Yendrawati & Asy'ari, 2017). Known as Audit Committee Meeting Frequency (ACMF), this quantitative measure indicates how often the committee gathers to execute its oversight role within a fiscal year (Yendrawati & Asy'ari, 2017). Indonesian regulation POJK 55/2015 recommends at least four meetings annually, a standard widely adopted since quarterly meetings are deemed sufficient for reviewing financial reports, internal controls, and compliance.

Earnings Management

Earnings management can be understood as a strategic managerial decision to choose specific accounting policies to influence reported earnings, with objectives such as maintaining company image, meeting performance targets, or aligning with market expectations. Although these choices remain within Generally Accepted Accounting Principles (GAAP), the flexibility offered by accounting standards is often exploited to align financial reporting outcomes with internal interests. (Scott, 2015; Yendrawati & Asy'ari, 2017). Hence, understanding this flexibility is essential in assessing financial reporting quality.

Technically, earnings management is most often conducted through accrual-based reporting. The focus is on discretionary accruals, which are manager-controlled. Unlike non-discretionary accruals, which arise from normal operations, discretionary accruals allow for manipulation, such as revenue acceleration or expense deferral, to shape earnings as desired. (Christiani & Nugrahanti, 2014). Thus, users must critically assess discretionary accruals when interpreting financial statements.

To assess the intensity of earnings management, researchers commonly use discretionary accruals (DA) as a proxy, calculated using the Modified Jones Model. DA values may be zero, positive, or negative:
DA = 0 earnings are smoothed.
DA > 0 income-increasing accruals.
DA < 0 income-decreasing accruals (income-decreasing) (Sulistyanto, 2008).

The method for computing Discretionary Accruals (DA) in the Modified Jones Model utilizes variations in revenue, fixed assets, and total assets to estimate normal accruals. The disparity between real accruals and standard accruals signifies discretionary accruals, indicating the degree of managerial engagement in earnings management activities. Comprehending this process is essential for analysts, auditors, and investors to evaluate the degree to which reported profits accurately represent the company's economic performance. The methodology for calculating earnings management using discretionary accruals encompasses the following phases:

1. Determine the value of Total Accruals
$$TAC_{it} = NI_{it} - CFO_{it}$$
2. Estimate Total Accruals using an OLS (Ordinary least Square) regression equation
$$TAC_{it}/A_{it-1} = b_1(1/A_{it-1}) + b_2(DREV_{it}/A_{it-1}) + b_3(PPE_{it}/A_{it-1}) + e_{it}$$
3. Calculate Non-discretionary Accruals
$$NDAC_{it} = b_1(1/A_{it-1}) + b_2((DREV_{it}/DREC_{it})/TA_{it-1}) + b_3(PPE_{it}/A_{it-1})$$
4. Discretionary Current Accruals
$$DAC_{it} = (TAC/A_{it-1}) - NDAC_{it}$$

Keterangan:
NI_{it} : $Net\ income\ of\ company\ i\ in\ year\ t$
CFO_{it} : $Cash\ flow\ from\ operating\ activities\ of\ company\ i\ in\ year\ t$
TAC_{it} : $Total\ accruals\ of\ company\ i\ in\ year\ t$
DAC_{it} : $Discretionary\ accruals\ company\ i\ in\ year\ t$
$NDAC_{it}$: $Non - discretionary\ accruals\ company\ i\ in\ year\ t$
A_{it-1} : $Total\ assets\ company\ i\ in\ year\ t$
REV_{it} : $Change\ in\ revenue\ of\ company\ i\ in\ year\ t$
REC_{it} : $Change\ in\ accounts\ receivable\ of\ company\ i\ in\ year\ t$
PPE_{it} : $Property, plant, and\ equipment\ of\ company\ i\ in\ year\ t$
$b_1 b_2 b_3$: $Regression\ coefficients$

The Influence of Earnings Management on Carbon Emission Disclosure

Agency theory emphasizes the existence of conflicting interests between capital owners (investors) and company managers. Investors seek returns on the funds they have invested, while managers often focus on personal objectives—such as obtaining bonuses, salary increases, or other benefits. These differing objectives may prompt managers to present biased or inaccurate information to maintain their reputation and highlight their personal performance (Yendrawati & Asy'ari, 2017).

In reality, earnings management behavior by managers is often disguised through enhanced corporate social responsibility (CSR) reporting, including carbon emission disclosure. This approach is intended to portray the company as environmentally conscious, thereby garnering sympathy and support from stakeholders (Prior et al., 2008). As a result, carbon emission reports may serve as a "smoke screen" to divert public attention from manipulative practices in financial reporting.

Conversely, robust corporate governance mechanisms—such as the participation of independent commissioners, proactive audit committees, and regulatory openness—can help reduce the likelihood of managers using environmental disclosures as a tool to deflect scrutiny. Additionally, increasing pressure from institutional investors and regulators, including stricter sustainability reporting requirements, can limit opportunities for hidden earnings management practices. In other words, high-quality oversight and accountability are essential to ensure that carbon emission disclosures genuinely reflect a company's environmental performance rather than merely serving as a branding strategy.

H1: There is a positive influence between earnings management and corporate carbon emission disclosure.

Corporate Governance as a Moderator of the Influence of Earnings Management on Carbon Emission Disclosure

According to agency theory, differing objectives between the company owner and management result in an information asymmetry risk—a gap in data access that may lead to decisions misaligned with the owner's interests. Corporate governance systems are designed to minimize such problems by providing monitoring mechanisms and balancing power between both parties. (Wardoyo et al., 2022).

One governance instrument considered adequate is the size of the board of commissioners. Research by Obigbemi et al., 2016 Shows that the larger the board, the greater its capacity to suppress earnings management practices—provided the commissioners possess adequate competence and capability. A board with diverse expertise is also believed to offer broader perspectives when evaluating financial reports.

In addition to board size, the presence of independent commissioners plays a crucial role in enhancing transparency, particularly in carbon emission reporting. Rupley et al., 2012 Argue that independent commissioners generally show greater concern for environmental issues compared to management, which often focuses on short-term profit targets. With a more neutral stance, they can encourage the company to be more transparent about its environmental performance.

In the context of reporting oversight, the audit committee plays a vital role. Several studies Albersmann & Hohenfels, 2017; Appuhami & Tashakor, 2017; Soliman & Abd-Elsalam, 2014

Research indicates that audit committees convening a minimum of four to five times annually are more proficient at supervising earnings management procedures and guaranteeing the integrity of CSR reporting. Regular meetings provide comprehensive discussions of audit results, hence reducing the risk of information manipulation.

Diverse corporate governance mechanisms—ranging from board size and makeup to the efficacy of the audit committee—substantially enhance the quality of company reporting, particularly with transparency in carbon emissions. Establishing robust governance safeguards the interests of owners and stakeholders while simultaneously improving the company's image among the public and regulatory bodies.

H2: Corporate governance moderates the influence of earnings management on carbon emission disclosure.

RESEARCH METHODS

This study used a quantitative approach to data collection. A variety of secondary sources of information, such as annual reports, financial statements, and sustainability reports, were used. The companies that are listed on the IDX and are participating in the PROPER program are the topic of this investigation. Five years, from 2017 to 2021, are included in the scope of the research.

The research subjects consist of 16 companies selected based on the following criteria:

- Listed as PROPER participants and on the Indonesia Stock Exchange from 2017 to 2021,
- Published annual financial statements,
- Explicitly or implicitly disclosed at least one point related to carbon emission disclosure in their annual reports,
- Used the Indonesian Rupiah (IDR) as the reporting currency, and
- Did not experience financial losses from 2017 to 2021.

RESULT AND ANALYSIS

This study uses MRA (Moderated Regression Analysis) or interaction testing. MRA is used to maintain sample representativeness and provide control over the moderating variable. A moderating variable is deemed to limit the effect of the independent variable on the dependent variable if the significance value is below 0.05 (Ghozali, 2018).

Summary Table: Moderated Regression Analysis Results

Variable	*Coefficient (B)*	*t-Value*	*Sig. (p-value)*	*Significance*
Constant	-24.388	-3.910	0.000	Significant
X1 (Earnings Management)	-1.262	–	> 0.05 (implied)	Not Significant
X1Z1 (X1 × Board of Commissioners)	0.100	3.335	0.001	Significant
X1Z2 (X1 × Independent Commissioners)	3.037	1.504	0.137	Not Significant
X1Z3 (X1 × Audit Committee Meetings)	-0.004	-0.247	0.806	Not Significant

Model Statistics

Test	*Value*	*Conclusion*
F-Test (ANOVA)	F = 6.402, p = 0.000	Model is statistically significant
Adjusted R^2	0.429	42.9% variance in Y explained by the model
Std. Error of Estimate	2.353	Lower than SD of Y (3.115), indicating good fit

The findings of the Moderated Regression Analysis indicate that the management of profits has a detrimental impact on the disclosure of carbon emissions. Among the moderating factors, the only one that has a substantial impact on carbon disclosure is the relationship between earnings management and the board of commissioners (X1Z1). In light of this, it is clear that the board of commissioners plays a crucial role in minimizing the adverse effects that profit management has on environmental transparency. It was determined that activities such as meetings with audit committees and engagements with independent commissioners were statistically insignificant. The model provides an explanation for 42.9% of the variance in carbon emission disclosure, indicating a sufficiently good match. The significance of corporate governance, and more specifically the board of commissioners, is highlighted by these results in enhancing accountability and disclosure practices related to environmental issues.

The Influence of Earnings Management on Carbon Emission Disclosure

The primary hypothesis that underpins this investigation is that the approach taken to profits management has an effect on the degree to which businesses disclose their carbon emissions. The t-test statistic for the earnings management variable is 1.346, which is higher than the significance level of 0.05, as shown by the outcomes of the test conducted on Model 1. According to the statistics, the management of profits does not have a substantial impact on the disclosure of carbon emissions. The profitability management techniques of a firm do not have a direct impact on the decision of the company to publish its carbon emissions.

This result contrasts with previous studies by Karim et al., 2021 This demonstrated a good association between profit management and carbon emission disclosure. The mismatch may arise from variations in study data, including timeframes, industry classifications, or regulatory contexts among various nations. Additionally, companies in this study may be more focused on compliance with environmental regulations or stakeholder demands, rather than using earnings management to enhance public image.

The Influence of Earnings Management on Carbon Emission Disclosure Moderated by Corporate Governance

The second hypothesis posits that corporate governance systems act as moderating factors that may either amplify or diminish the association between profit management and carbon emission disclosure. This research defines corporate governance via three moderating variables: board size (Z1), the ratio of independent commissioners (Z2), and the frequency of audit committee meetings (Z3).

A significance level of 0.001 indicates that the outcomes of the t-test suggest that the number of commissioners has a significant effect on the link between profit management and carbon emission disclosure. This suggests that an expanded board of commissioners enhances the impact of profit management on environmental transparency, particularly in carbon emission reporting. A bigger board is more likely to exhibit enhanced oversight capabilities and foster more openness.

In contrast, the two supplementary moderating variables—the proportion of independent commissioners and the frequency of audit committee meetings—do not significantly influence the relationship between earnings management and carbon emission disclosure. This suggests that the presence of independent commissioners and regular audit meetings may be insufficient to affect the company's level of environmental disclosure.

The differences in effectiveness among these variables may be due to the active roles and responsibilities held by each corporate governance element. For instance, although independent commissioners are theoretically tasked with overseeing management, in practice, they may not have a strong enough influence over strategic decision-making processes. Consequently, our results underscore the significance of the genuine quality and efficacy of corporate governance procedures, not merely their structural existence. The study suggests that enhancing internal oversight—particularly through the board of commissioners—can be a key strategy in promoting corporate environmental accountability.

CONCLUSION

The test results and analysis demonstrate that earnings management does not substantially affect carbon emission disclosure. The study indicates that the board of commissioners substantially influences the relationship between profit management and carbon emission disclosure.

This study is limited since it only encompasses domestic industrial businesses as research subjects. Future research could be strengthened by incorporating corporations from countries with more advanced and comprehensive legislation on carbon emission reporting and industrial emissions management.

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