

The Effect Institutional Ownership and Environmental Certification on Carbon Emissions Disclosure

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ABSTRACT

This study explores carbon emission disclosure by non-financial companies listed on the Indonesia Stock Exchange (IDX) during the 2016–2022 period. The purpose of this study is to analyze the effect of institutional ownership on the intensity of carbon emission disclosure, as well as the moderating role of environmental certifications such as ISO 14001 or EMAS in this relationship. The method used is quantitative analysis through unbalanced panel data regression with a fixed effects model, including variables such as institutional ownership, environmental certification, and their interaction. The results of the analysis show that institutional ownership significantly increases the level of carbon emission disclosure, as oversight pressure from large shareholders encourages managerial transparency. However, companies with environmental certification tend to reduce additional disclosure, as if they already feel they have met credibility standards. This is evident from the negative interaction coefficient between institutional ownership and environmental certification. This finding reveals a paradox: certification, which should increase environmental responsibility, can reduce the initiative to share information voluntarily. In conclusion, regulators and institutional stakeholders need to promote policies that ensure consistent emissions disclosure, including among certified companies, to reduce information asymmetry and strengthen carbon accountability.

Keywords: Carbon Emission Disclosure, Environmental Certification, Institutional Ownership, ISO 14001, Non-Financial Companies.

ABSTRAK

Studi ini mengeksplorasi pengungkapan emisi karbon oleh perusahaan non-keuangan yang terdaftar di Bursa Efek Indonesia (BEI) selama periode 2016–2022. Tujuan studi ini adalah untuk menganalisis pengaruh kepemilikan institusional terhadap intensitas pengungkapan emisi karbon, serta peran moderasi sertifikasi lingkungan seperti ISO 14001 atau EMAS dalam hubungan ini. Metode yang digunakan adalah analisis kuantitatif melalui regresi data panel tak seimbang dengan model efek tetap, yang mencakup variabel-variabel seperti kepemilikan institusional, sertifikasi lingkungan, dan interaksinya. Hasil analisis menunjukkan bahwa kepemilikan institusional secara signifikan meningkatkan tingkat pengungkapan emisi karbon, karena tekanan pengawasan dari pemegang saham besar mendorong transparansi manajerial. Namun, perusahaan dengan sertifikasi lingkungan cenderung mengurangi pengungkapan tambahan, seolah-olah mereka sudah merasa telah memenuhi standar kredibilitas. Hal ini terlihat dari koefisien interaksi negatif antara kepemilikan institusional dan sertifikasi lingkungan. Temuan ini mengungkap sebuah paradoks: sertifikasi, yang seharusnya meningkatkan tanggung jawab lingkungan, dapat mengurangi inisiatif untuk berbagi informasi secara sukarela. Kesimpulannya, regulator dan pemangku kepentingan

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institusional perlu mempromosikan kebijakan yang memastikan pengungkapan emisi yang konsisten, termasuk di antara perusahaan bersertifikat, untuk mengurangi asimetri informasi dan memperkuat akuntabilitas karbon.

Kata kunci: *Pengungkapan Emisi Karbon, Sertifikasi Lingkungan, Kepemilikan Institusional, ISO 14001, Perusahaan Non-Keluangan.*

INTRODUCTION

Climate change is one of the topics of the Sustainable Development Goals. Climate change can be caused by carbon emissions and greenhouse gases due to global warming (Arifah & Haryono, 2021). One of the main causes of global warming in recent decades has been carbon emissions (Churchill et al., 2019). This is evidenced by the high levels of CO₂ caused by the widespread use of fossil fuels and other energy sources (Ahmed & Afza, 2019; Darsono, 2021; Habiba et al., 2022). Excessive carbon emissions can lead to environmental issues and climate change (Chen et al., 2021). Efforts to mitigate climate change certainly depend on the commitment of major emitters. More and more governments are announcing goals to achieve net zero emissions for the long term and are showing more interest in overcoming the tremendous challenges of developing solutions related to the potential for low carbon emissions (Ebaid, 2009; Akhtaruddin & Haron, 2010).

According to Carbon Brief Clear on Climate (2019), Indonesia was the fourth-largest carbon emitter in the world in 2015. According to Muhajir (2022), this is consistent with Indonesia having the worst air pollution in ASEAN. High levels of greenhouse gas emissions have the potential to seriously endanger human life since they can have an impact on a nation's economic growth (Aliffia et al., 2025). Global warming and other environmental and climatic changes are exacerbated by carbon emissions (Hermawan et al., 2018). Nonetheless, it is still uncommon for Indonesian businesses to disclose their environmental practices, particularly when it comes to carbon emissions (Simamora et al., 2022). A study by Hsu et al. (2016) and Patty et al. (2024) revealed that Indonesian enterprises disclosed carbon emissions on average at a rate of 0.211. Furthermore, a study by Luo et al. (2013) looked at the amount of information that businesses in 15 different nations disclosed.

The findings of the study showed that the average carbon emission disclosure by the sample countries was 0.411. Low levels of disclosure can have an impact on high information asymmetry and reduce financial markets due to obstacles to the lack of relevant information flow to stakeholders (Basuony et al., 2018). Disclosure of carbon emissions is crucial as a result. According to Ramiz et al. (2020), information asymmetry can increase the market value of companies that disclose, lessen agency issues, and enable investors to perform financial evaluations.

The existence of company owners is believed to be able to reduce information asymmetry. This is because the owner has great power over the company's activities, and the impact of the company's activities will be borne by the owner, so the owner definitely wants the company to improve. Institutional owners can be useful in their long-term assessments in seeing social responsibility (Yuan et al., 2022). Institutional owners have influence, for example, in terms of transparency to corporate disclosures that can reduce agency problems (Liu et al., 2014). From another perspective, environmental certification owned by a company can play an important role in the company. Environmental certification owned by a company shows that the company complies with regulations and meets established standards. Companies that obtain environmental certificates will support extensive disclosure (Bawono & Haryanto, 2015; El-Diftar et al., 2017). Certification owned by a company illustrates that the company has made environmental improvements and a corporate image (Indriastuti et al., 2022).

This study examines the relationship between institutional ownership's disclosure of carbon emissions and environmental certification. Does the relationship between

institutional ownership and disclosure of carbon emissions change when environmental certification is present? In the next parts, this study will present a review of the literature and formulate some ideas. In Section 3, the sample and research methods are explained. In Section 4, the study's findings are examined. Section 5 has the conclusion.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Institutional Ownership and Carbon Emissions Disclosure

According to agency theory, institutional ownership plays a crucial role in reducing information asymmetry and encouraging corporate transparency regarding environmental, social, and economic aspects (Delfy & Bimo, 2021). Institutional ownership is considered an effective oversight mechanism for managerial decisions, thereby mitigating agency conflicts between managers and shareholders (Setyawan et al., 2018). Pressure from institutional investors also encourages management to be more transparent in risk reporting practices (Kamaruzaman et al., 2019). Furthermore, when institutions hold a majority stake, they exert greater control over management to maximize returns, which impacts the level of carbon emissions disclosure (Zulkarnaen & Darmawati, 2025). This is because companies controlled or closely monitored by institutions tend to be more subject to demands for clear and specific information (Tran et al., 2021). High institutional ownership is also correlated with strong and effective internal controls in financial reporting and disclosure transparency (Fang & Zhou, 2012). Khan et al. (2013) explicitly stated that disclosure levels will be higher in institutionally owned companies. Similarly, a meta-analytic review by Khlif et al. (2017) and Fina et al. (2024) showed that institutional ownership has a positive effect on disclosure, including disclosures related to carbon emissions. These findings consistently support the idea that institutions act not only as passive investors but also as active monitors, encouraging management to be more responsible and transparent, particularly in disclosing the company's environmental impact. Institutional investors have both the resources and the incentives to demand high-quality, timely information to protect their investments and manage portfolio risks. As a result, they often push firms to enhance carbon disclosure as a way to signal good governance, reduce reputational risks, and align with long-term sustainability objectives.

H1: Institutional ownership has a positive effect on carbon emission disclosure.

Institutional Ownership and Environmental Certification

Environmental certification is considered to strengthen a company's credibility in conveying information related to environmental aspects (Sumiani et al., 2007). Companies with this certification are encouraged to improve environmental quality, corporate image, company activities, and community relations (Corbett et al., 2003). Recognition of this environmental commitment also signals a company's serious commitment to environmental issues (Aryni et al., 2021). As a result, environmental certification significantly influences the level of environmental information disclosure by companies (Yusoff et al., 2013; Fahmie et al., 2025). Furthermore, certified companies are able to demonstrate their ability to create a healthy and sustainable work environment, reflected in improved environmental performance (Prakoso, 2020). This certification is also considered to increase transparency, as certified companies tend to demonstrate an open and responsible attitude in disclosing their information (Clarkson et al., 2011). As an illustration, research shows that implementing environmental management systems such as ISO 14001 helps companies improve their environmental performance. A study of companies in Portugal found a positive relationship between environmental certification and the level of environmental information disclosure (Monteiro et al., 2021). The implementation of good environmental management practices has also been shown to reduce the impact of carbon emissions (Pratitri & Zulaikha, 2016) and companies with superior environmental performance are more likely to increase transparency through carbon emissions disclosure (Giannarakis et al., 2017). A meta-analysis even confirmed

that environmental certification consistently correlates positively with the quality of environmental information disclosure and company performance. Overall, empirical evidence suggests that environmental certification not only improves environmental image and performance but also encourages greater transparency through the disclosure of corporate sustainability information.

H2: Environmental certification strengthens the influence of institutional ownership on carbon emission disclosure.

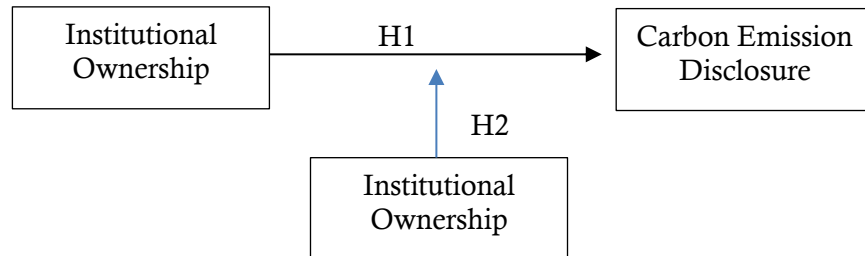


Figure 1. Research Framework

Figure 1 shows a conceptual framework that positions institutional ownership as the independent variable influencing carbon emissions disclosure, which serves as the dependent variable. The underlying assumption is that higher institutional ownership encourages greater transparency and accountability, leading companies to disclose more comprehensive information about their carbon emissions. Environmental certification is introduced as a moderating variable that strengthens this relationship, as certified companies are bound by stricter environmental standards and monitoring, thereby enhancing the positive effect of institutional ownership on disclosure practices. In this framework, the analysis examines both the direct impact of institutional ownership on carbon emissions disclosure and the moderating role of environmental certification in reinforcing that effect.

RESEARCH METHODS

This study uses a quantitative design with a panel data approach to analyze the relationship between institutional ownership, environmental certification, and carbon emission disclosure. Secondary data were collected from company websites and available annual reports for 622 non-financial companies listed on the Indonesia Stock Exchange between 2016 and 2022. After variable cleaning and elimination of incomplete data, a final sample of 3,040 observations was obtained.

In terms of data collection instruments and techniques, carbon emission disclosure indicators were measured using the GRI Carbon Footprint Score (2016), which is calculated quantitatively based on the intensity and scope of reporting. Institutional ownership was measured as the percentage of shares held by institutions to total outstanding shares at the end of the year. The moderating variable, environmental certification, was assigned a value of 2 if the company held ISO 14001 and PROPER certifications (green/gold), 1 if only one of these certifications was held, and 0 if neither had been held. This ownership data was obtained from annual reports and selected reports.

Several control variables were added, including: the proportion of member directors on the audit committee as an indicator of governance; the percentage of female directors as a proxy for gender diversity; Firm size, calculated as the log of total assets; firm age, calculated as the difference between the observation year and the founding year; a binary indicator for the existence of an annual report; and a Covid-19 dummy variable, which takes the value 1 for 2020–2022 and 0 otherwise.

The data analysis method used was multiple linear regression on unbalanced panel data with a fixed effects model. The model specifications tested were:

$$CED_{it} = \beta_0 + \beta_1 Inst_{it} + \beta_2 ES_{it} + \beta_3 Inst * ES_{i,t} + \beta_4 AC_{it} + \beta_5 Gen_{it} + \beta_6 Size_{it} + \beta_7 Age_{it} + \beta_8 SR_{it} + \beta_9 Covid_{it} + \varepsilon_{it}$$

Where CED = Carbon Emission Disclosure, Inst = Institutional, ES = Environmental Certification, AC = Audit Committee, Gen = Gender, Size = Company Size, Age = Company Age, SR = Sustainability Report, Covid = Covid-19. Data processing and analysis were performed using statistical software of SPSS to test regression analysis.

RESULTS

Table 1 provides a summary of the descriptive statistics of the seven variables in the panel data regression analysis with 3,043 observations. A brief but concise explanation follows: The dependent variable, CED (carbon emissions disclosure), has a mean of 1.061, a standard deviation of 1.721, and a value ranging from 0 to 7, indicating a range from no disclosure at all to the maximum level of disclosure according to the GRI indicators. The primary independent variable, Inst (institutional ownership), has a mean of 0.416 (41.6%), with a standard deviation of 0.321, a minimum value of 0, and a maximum value of 0.961, indicating a large variation in the proportion of institutional ownership in companies.

ICE (environmental certification: ISO14001/PROPER) has a mean of 0.262, a standard deviation of 0.518, and a value ranging from 0 to 2. This indicates that most companies have no environmental certification, while a small number have one or two certifications. Regarding the control variables, CA (expert audit committee composition) averaged 0.674 with a range of 0–1, indicating that most audit committees are composed of expert members, although the proportion varies across companies. Gene (percentage of female directors) averaged 17.6%, with a standard deviation of 13.9%, and ranged from 0–100%, indicating limited gender diversity in many companies. Size (log of total assets) averaged 12.169, with a standard deviation of 1.066, and a range of 2.941–14.616, reflecting a sample of small to large companies. Age (firm age) averaged 31.69 years, with a standard deviation of 18.07, and a range of 2–166 years, indicating a range from newly established to established companies.

Table 1. Summary of Descriptive Analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
CED	3,043	1,061	1,721	0,000	7,000
Inst	3,043	0.416	0.321	0,000	0.961
ICE	3,043	0.262	0.518	0,000	2,000
CA	3,043	0.674	0.256	0,000	1,000
Gene	3,043	0.176	0.139	0,000	1,000
Size	3,043	12,169	1,066	2,941	14,616
Age	3,043	31,691	18,068	2,000	166,000

Table 2 presents the distribution of two dummy variables, Sustainability Report (SR) and Covid, with a total of 3,043 observations. The dummy variable has only two values: 1 indicating the presence of a condition and 0 indicating its absence. For the SR variable, it is known that 32.37% of observations (985 companies) scored 1, meaning the company published a sustainability report. Conversely, 67.63% (2,058 companies) did not publish such a report, with a score of 0. Meanwhile, the COVID variable indicates whether the observation period fell during the pandemic (2020–2022). A total of 51.40% of observations (1,564 companies) fell during the pandemic period (score = 1), while 48.60% (1,479 companies) fell outside the pandemic period (score = 0). The interpretation of these variables in the regression analysis is as follows: the coefficient for SR indicates the average difference in carbon emission disclosure between companies that prepare sustainability reports and those that do not. Conversely, the COVID coefficient indicates the change in emission disclosure during the pandemic compared to the normal period. The application of dummy variables such as this allows for the measurement of the

“presence vs. absence” effect of a particular condition directly in the regression model, as is common practice in linear regression analysis.

Table 2. Dummy Variable

Variable	% Score 1	% Score 0	% Total
SR	(985) 32.37%	(2,058) 67.63%	(3,043) 100%
Covid	(1,564) 51.40%	(1,564) 48.60%	(3,043) 100%

Table 3 indicates that the correlation value between the independent variables is less than 0.90, it can be said that there is little correlation between the independent variables, hence avoiding the multicollinearity issue. Table 3 displays the Pearson correlations between the nine variables in the study. The dependent variable, CED, has a weak positive correlation with several control variables, such as ICE ($r=0.328$), Size ($r=0.226$), Age ($r=0.143$), and the highest correlation with SR ($r=0.382$), indicating that companies that prepare sustainability reports tend to disclose emissions more intensively. Negative correlations with Inst ($r=-0.059$) and Gene ($r=-0.141$) indicate a reverse relationship with institutional ownership and gender diversity, albeit weak. For the independent variables, Inst has a slight negative correlation with ICE ($r=-0.094$), CA ($r=-0.118$), and Age ($r=-0.142$), and a weak positive correlation with Gene ($r=0.175$), indicating that institutions tend to be more active in companies with a higher proportion of female directors. ICE has a low positive correlation with CED ($r=0.328$), Size ($r=0.221$), and Age ($r=0.141$), but a negative correlation with Gene ($r=-0.163$), indicating that environmentally certified companies tend to be larger and older, but with lower female representation. Other correlation values such as CA, Gene, Size, Age, SR, and Covid generally range from ± 0.05 to ± 0.38 , indicating a generally weak to moderate linear relationship. This is in accordance with the principle that Pearson coefficients between 0.2–0.4 are considered low to moderate correlations, and values close to 0 indicate a very weak or no strong relationship. The inequality of such low correlations suggests the absence of serious multicollinearity and supports the appropriateness of the variable relationships in the regression model.

Table 3. Pearson Correlation

Variable	CED	Inst	ICE	CA	Gene	Size	Age	SR	Covid
CED	1,000								
Inst	-0.059	1,000							
ICE	0.328	-0.094	1,000						
CA	0.046	-0.118	0.025	1,000					
Gene	-0.141	0.175	-0.163	-0.149	1,000				
Size	0.226	0.013	0.221	-0.017	-0.084	1,000			
Age	0.143	-0.142	0.141	0.074	-0.152	0.198	1,000		
SR	0.382	0.033	0.153	-0.035	-0.038	0.211	0.088	1,000	
Covid	-0.041	-0.108	-0.025	-0.017	0.030	-0.047	-0.093	-0.029	1,000

Table 4 presents the results of a multiple linear regression with fixed effects panel data on 3,043 observations, where CED (carbon emissions disclosure) is the dependent variable. The coefficient of Inst (institutional ownership) of 0.390 ($t=2.520$, $p=0.012$) indicates that a 1-point increase in the proportion of institutional ownership is associated with an increase of approximately 0.39 points in the emissions disclosure score, confirming a significant positive effect. This value is consistent with the literature finding that institutional investors encourage ESG transparency. The coefficient of ICE (environmental certification) of 0.326 ($t=2.660$, $p=0.008$) indicates that certified companies tend to disclose higher carbon emissions. However, the interaction between Inst and ES is reflected in Inst*ES of -0.770 ($t=-3.980$, $p<0.001$), indicating a negative moderating effect: institutional ownership drives emissions disclosure, but this effect

weakens and even reverses if the company is certified, creating a legitimacy paradox as explained by moderation theory.

Among the control variables, Size (log of assets) has a significant positive effect of 0.198 ($t=5.220$, $p<0.001$), and Age (firm age) has a significant positive effect of 0.153 ($t=13.140$, $p<0.001$), indicating that larger and older companies have more extensive disclosure. The variable SR (sustainability report) also increases CED by 0.324 ($t=5.780$, $p<0.001$), indicating a positive benefit of publishing a sustainability report. Conversely, the variables CA, Gene, and Covid are insignificant ($p>0.05$), indicating that audit committee composition, gender diversity, and pandemic conditions do not have a significant impact on the model. The Adjusted R² value of 0.196 indicates that the model explains approximately 19.6% of the variation in emissions disclosure. The F-test (Prob F = 0.000) shows the model is significant. In conclusion, ownership structure and environmental certification have a complex effect on emissions disclosure: while institutions and certification encourage disclosure, their interaction reduces this encouraging effect.

Table 4. Regression Analysis

CED	Coeff.	Std. Error.	t	Sig.
Inst	0.390	0.155	2,520	0.012 **
ICE	0.326	0.123	2,660	0.008 ***
Inst*ES	-0.770	0.194	-3,980	0,000 ***
CA	-0.186	0.199	-0.930	0.352
Gene	0.535	0.371	1,440	0.149
Size	0.198	0.038	5,220	0,000 ***
Age	0.153	0.012	13,140	0,000 ***
SR	0.324	0.056	5,780	0,000 ***
Covid	0.036	0.038	0.960	0.338
Cons	-6,471	0.583	-11,090	0,000
Adj R2	0.196	0.196	0.196	0.196
F Statistics	65,460	65,460	65,460	65,460
Prob F	0,000	0,000	0,000	0,000
N	3,043	3,043	3,043	3,043

Significance level: *10%, **5%, ***1%

DISCUSSION

The Fixed Effects Model (FEM) was selected in this study after conducting Chow, Hausman, and Lagrange multiplier tests, which confirmed FEM as the best model. At the 5% significance level and with a coefficient of 0.390, the regression results (Table 4) indicate that institutional ownership has a positive and significant effect on carbon emission disclosure, thus accepting hypothesis H1. This aligns with Fang and Zhou's (2012) findings that institutional ownership improves internal control and reporting transparency; their study demonstrated a strong relationship between institutional ownership, internal control, and reporting quality. Literature supports institutional investors also act as efficient monitors (Fang & Zhou, 2012) and encourage companies to disclose greater carbon emissions (Khlif et al., 2017; Velte, 2020; Tran et al., 2021). Research in developing countries like China even shows that stable institutional investors significantly improve the quality of environmental disclosure, reflecting their influence in reducing information asymmetry. Similarly, global surveys show that institutional investors demand climate risk disclosure and are motivated to support regulations that strengthen ESG transparency.

The interaction term between institutional ownership and environmental certification (Inst×ES) has a coefficient of -0.770 with a significance value of 0.000, indicating that environmental certification encompasses the positive effect of institutional ownership on carbon emission disclosure, deviating from hypothesis H2. Although institutional investors are effective in monitoring financial reporting (Fang & Zhou, 2012), certification processes such as ISO14001 or PROPER require significant costs and resources (Flagstad et al., 2022), based on findings of 'certification dissonance' in small-scale companies. Due

to the high costs and time required, certified companies may reduce the intensity of additional disclosures to be more budget efficient. This phenomenon reflects a paradox: certification is designed to enhance credibility and environmental practices, but it can actually reduce institutional incentives to make further disclosures. In this context, institutions, as large owners, are less motivated to promote additional transparency, as certification is perceived as sufficient to meet oversight expectations. This suggests that safeguard mechanisms can replace institutional oversight of voluntary disclosure, resulting in certification and institutional safeguards mutually negating their impact.

CONCLUSION

This study, which analyzed 3,043 observations of non-financial companies listed on the Indonesian Stock Exchange (IDX) between 2016 and 2022, found that institutional ownership significantly increases carbon emissions disclosure, as institutional shareholders encourage more effective oversight, leading to more voluntary reports. However, this effect weakens when companies have environmental certification with ISO 14001 or PROPER, with a negative interaction coefficient, indicating that after certification, institutional incentives for additional disclosure are reduced.

This finding has important implications for companies and regulators. Companies should consider their carbon emissions communication strategies to ensure that the certification does not replace institutional disclosure. Regulators and investors, meanwhile, need to formulate policies that encourage emissions transparency even after companies have obtained certification.

This study has limitations. First, the observation period includes the year of the Covid-19 pandemic, when emissions activity tends to be low, which may influence the results. Second, in the initial years of the study, the number of companies publishing sustainability reports was still limited, making the study period less representative of long-term trends. For future research, it is recommended to extend the observation period post-pandemic until stability is achieved to test whether this pattern persists. Furthermore, further studies could explore the public ownership variable, given the growing pressure from public opinion for transparency, to provide a more comprehensive picture of the factors influencing carbon emissions disclosure.

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