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Determinants Of Carbon Emission Disclosure Under IFRS S2 In Indonesian Property And Real Estate Companies

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Abstract

This study investigates whether company size, media exposure, and environmental performance influence Carbon Emission Disclosure (CED) among property and real estate firms listed on the Indonesia Stock Exchange (IDX). Carbon reporting in Indonesia is still voluntary, practices differ across firms, and earlier evidence is mixed. Drawing on legitimacy and stakeholder theory, this quantitative study uses secondary data from annual reports, sustainability reports, and Indonesian online news portals for 2023-2025. Purposive sampling produced 65 firms and 195 firm-year observations. CED is scored with a 15-item index derived from IFRS S2. Company size is proxied by the natural log of total assets, media exposure by the Janis-Fadner coefficient (JFC), and environmental performance by ISO 14001 certification. Company age, profitability, and leverage are controls. Panel regression is employed, and Chow and Hausman tests point to the fixed effect model. Results show media exposure and environmental performance relate positively and significantly to CED, while company size has no significant relationship. Average disclosure is only 17.6%, indicating limited carbon reporting. The study contributes by testing three determinants jointly in an understudied sector and using the JFC to capture news tone. Managers and regulators should consider standard-setting for carbon reporting and closer engagement with the media.

Keywords: Carbon Emission Disclosure.

INTRODUCTION

Urbanization is widely viewed as a major engine of economic growth (Njoh, 2003). Indonesia is urbanizing quickly: around 57% of its residents lived in urban areas by 2020, and the share is expected to exceed 70% by 2046. As more people move to cities, demand rises for housing, offices, and commercial centers, which has expanded the

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property and real estate sector considerably (Amaya et al., 2024). In this context, the sector covers the development, management, and trading of land and buildings that carry high economic value (OSS, 2025).

At the same time, property and real estate contribute heavily to the climate crisis. The Global Status Report for Buildings and Construction 2024–2025, produced by the United Nations Environment Programme (UNEP) and the Global Alliance for Buildings and Construction (GlobalABC), reports that in 2023 buildings and construction accounted for roughly 32% of global energy consumption and about 34% of worldwide carbon dioxide (CO2) emissions. The sector's reliance on cement and steel alone adds an estimated 18% of global emissions, which places it among the biggest drivers of climate change. In Indonesia, fossil-fuel CO2 emissions reached 812 million tons in 2024, up 5.13% from the previous year (Worldometer, 2025). Beyond emissions from operations, property development converts land and removes green open space, which has triggered public resistance to real estate projects in several regions (Syatori, 2025; Arifin, 2026). Such conditions heighten legitimacy pressure on firms to be more open about how they manage environmental matters.

That openness takes the form of Carbon Emission Disclosure (CED), meaning the reporting of climate risks, energy use, and emissions generated by corporate activities (Florencia & Handoko, 2021). In Indonesia, POJK No. 51/POJK.03/2017 obliges public companies to publish sustainability reports. However, its Appendix II sets out only general content and does not yet require emissions to be quantified under internationally recognized standards. IFRS S2 Climate-related Disclosures addresses this gap by offering a climate reporting framework that can be embedded in digital reporting systems. The 15-item index built on IFRS S2 by (Azizah et al., 2026) makes it possible to judge how broadly firms disclose. Even so, few Indonesian property and real estate companies have adopted the standard, and disclosure levels differ across firms because adoption is still voluntary (Hidayat et al., 2022).

Legitimacy theory and stakeholder theory can explain why disclosure levels differ. Legitimacy theory holds that firms disclose to secure acceptance from society, whereas stakeholder theory stresses meeting the expectations of parties with a stake in the firm. Company size, Media Exposure, and Environmental Performance are among the factors expected to shape CED. Larger firms run broader operations and face stronger public scrutiny, so they tend to disclose more (Mujiani et al., 2019; Yusuf, 2020). However, (Wahyuningsih et al., 2023) found that size had no effect on CED. Media exposure, as a channel that spreads environmental information to stakeholders, can encourage firms to disclose emissions in order to build a favorable image (Haura & Yuliandhari, 2024; Aini et al., 2021). On the contrary, (Sulistyawati & Saputro, 2025) argue that media coverage does not always prompt disclosure. Environmental performance reflects how much a firm

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cares for the environment, and firms that perform well often use CED to reinforce their legitimacy (Hidayat et al., 2022; Salsabila & Purwasih, 2023), although other studies found no significant effect (Ratmono et al., 2020; Yanto et al., 2025). These mixed results point to a research gap, especially for the property and real estate sector under current regulations.

This study therefore aims to provide empirical evidence on how Company Size, Media Exposure, and Environmental Performance affect Carbon Emission Disclosure, using the IFRS S2 framework for Indonesian property and real estate companies during 2023–2025. Theoretically, it extends the use of legitimacy and stakeholder theory to sustainability accounting practice in the digital economy. Practically, the results can inform evaluations by company management and by regulators such as OJK and IAI who seek to promote standardized climate-related reporting. The novelty lies in applying an IFRS S2-based index of 15 items (Azizah et al., 2026) to this sector in 2023–2025, the most recent period after IFRS S2 was issued and thus more informative about current disclosure practice. The study is expected to enrich the sustainability accounting literature and to serve as a reference for further research

LITERATURE REVIEW

Theoretical Review

Legitimacy theory argues that firms try to align their activities with the norms and values accepted by society in order to gain legitimacy (Deegan, 2002). With respect to carbon, firms with a large environmental footprint are likely to disclose emissions as a way to show environmental concern and maintain legitimacy (Alfani & Diyanty, 2020). Stakeholder theory, by contrast, proposes that a firm's long-term survival relies on the support of its stakeholders (Freeman, 1984). Carbon Emission Disclosure acts as a form of accountability toward stakeholders such as investors, regulators, and the public, and it aims to improve corporate image and show commitment to environmental initiatives (Maulidiavitasari & Yanthi, 2021).

Hypothesis Development

Company Size

Company size is regarded as a determinant of Carbon Emission Disclosure. Larger firms usually run more complex operations, use more resources, and cause greater environmental impact (Dang et al., 2018). They are also more visible to the public and under stronger stakeholder pressure to disclose (Yusuf, 2020). Legitimacy theory predicts that such firms will disclose carbon information more extensively to protect their image and legitimacy. Research by (Setiany et al., 2022) and (Rini et al., 2021) found

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that company size has a positive effect on CED. Based on this reasoning, the following hypothesis is proposed:
H1: Company Size has a positive effect on Carbon Emission Disclosure (CED).

Media Exposure

Media exposure is the amount of attention that the media gives to a company. Coverage of a firm's environmental activities pushes it toward greater transparency about carbon emissions in order to build a good reputation (Hidayat et al., 2022). From the standpoint of legitimacy theory, firms that receive heavy coverage are pressed to disclose emissions as proof of commitment and to protect their legitimacy; as a result, firms with high exposure face stronger demands for extensive carbon disclosure (Abdullah et al., 2020). Research by (Florencia & Handoko, 2021) and (Aini et al., 2021) report that media exposure plays a positive role in Carbon Emission Disclosure. The second hypothesis is therefore:
H2: Media Exposure has a positive effect on Carbon Emission Disclosure (CED).

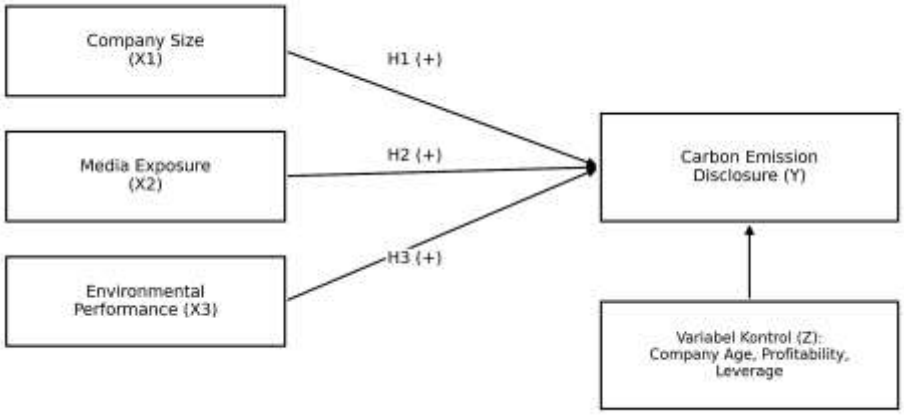
Environmental Performance

Environmental performance is a determinant of Carbon Emission Disclosure and describes how well a company contributes to a healthy environment (Amaliyah & Solikhah, 2019). Companies with good environmental performance tend to communicate their achievements to stakeholders through environmental disclosure, including carbon information (Clarkson et al., 2006). Legitimacy theory suggests that firms disclose more about their emissions to demonstrate accountability, preserve public legitimacy, and meet stakeholder demands. Research by (Kiswanto et al., 2023) and (Salsabila & Purwasih, 2023) found that environmental performance positively affects Carbon Emission Disclosure. Hence, the third hypothesis is:
H3: Environmental Performance has a positive effect on Carbon Emission Disclosure (CED).

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Image 1. Conceptual Framework



Source: Data Processed (2026)

METHODOLOGY

Data and Selection Samples

This study uses secondary data obtained from the official Indonesia Stock Exchange (IDX) website and from the websites of the sampled companies. The population comprises all property and real estate companies listed on the IDX over 2023–2025. Samples were chosen by purposive sampling based on three criteria: (1) the company was listed on the IDX throughout 2023–2025; (2) it published complete annual reports for the period; and (3) it published complete sustainability reports for the period. These criteria left 65 companies, giving 195 firm-year observations (Table 1).

Table 1. Sampling Criteria

Criteria	Number of Companies	Number of Observations
Property and real estate sector companies listed on the Indonesia Stock Exchange (IDX) for the 2023–2025 period.	78	231
Companies that do not publish complete annual reports for the 2023–2025 period.	(8)	(24)
Companies that do not publish a complete sustainability report for the 2023–2025 period.	(5)	(15)
Total Sample	**65**	**195**

Source: Data Processed (2026)

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Definition And Measurement of Variables

The dependent variable is Carbon Emission Disclosure, assessed through content analysis of annual and sustainability reports. CED refers to the information a company provides about its carbon emissions and its efforts to limit the effects of climate change, as reported in these documents. Disclosure is scored with an index of 15 items developed by (Azizah et al., 2026) on the basis of IFRS S2, which serves as an international reference. The index is grouped into six categories: GHG Emission Measurement (E1–E2), Measurement Methodology and Assumptions (E3–E6), Emission Targets and Decarbonization Performance (E9–E12), Carbon Pricing and Transition Risk (E7–E8), Carbon Credits and Offsetting (E13 and E15), and Verification and Certification (E14).

Table 2. Carbon Emission Disclosure Index

Code	Carbon Emission Disclosure Indicator	Category	IFRS S2 Referency
E1	Total gross greenhouse gas (GHG) emissions the company produced in the reporting year, stated in metric tons of CO_2	GHG Emissions Measurement	Par. 29(a)(i)–(iii)
E2	Classification of emissions by Scope 1, Scope 2, and Scope 3	GHG Emissions Measurement	Par. 29(a)(i) (1–3)
E3	Use of an accepted measurement standard, such as the GHG Protocol	Measurement Methodology & Assumptions	Par. 29(a)(ii–iii), B23–B31
E4	Description of the measurement approach, input data, and assumptions applied	Measurement Methodology & Assumptions	Par. 29(a)(iii) (1–3)
E5	Reasoning behind the choice of measurement approach	Measurement Methodology & Assumptions	Par. 29(a)(iii)(2)
E6	Explanation of why measurement methods or assumptions were changed	Measurement Methodology & Assumptions	Par. 29(a)(iii)(3), 29(f)
E7	Application of an internal carbon price	Carbon Pricing & Transition Risk	Par. 29(f)(i)

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Code	Carbon Emission Disclosure Indicator	Category	IFRS S2 Referency
E8	Internal carbon price used per ton of CO_2	Carbon Pricing & Transition Risk	Par. 29(f)(ii)
E9	Type of GHG emission reduction targets set	Emission Targets & Decarbonization Performance	Par. 33(a–h)
E10	Basis used to set the target baseline and the rationale for choosing it	Emission Targets & Decarbonization Performance	Par. 36(a–c)
E11	Statement on whether targets are absolute or based on emission intensity	Emission Targets & Decarbonization Performance	Par. 33(g)
E12	Decarbonization plans or transition strategies specific to the sector	Transition Strategy	Par. 14(a)(iv), 22
E13	Net emissions reported after taking offsets into account	Carbon Credits & Offsetting	Par. 36(c), 36(e)
E14	Independent third-party verification or assurance of emission targets and/or net emissions	Verification & Assurance	Par. 32(a–b)
E15	Description of the types of carbon credits used	Carbon Credits & Offsetting	Par. 36(e)(ii–iv)

Source: Azizah et al. (2026)

The Carbon Emission Disclosure Index is measured with a dichotomous scoring system, an item that is disclosed receives 1 and an item that is not disclosed receives 0. The CED score equals the sum of disclosed items (Σdi) divided by M, the total number of items in the index (15 items based on IFRS S2), so the score expresses disclosure as a share of the maximum possible. The formula is as follows:

$$CED = \frac{\sum \mathbf{di}}{\mathbf{M}}$$

This study uses company size, media exposure, and environmental performance as independent variables. Company size describes the scale of a firm and the extent of its resources. According to (Dang et al., 2018) note that size can be proxied by total assets, sales, or market capitalization, each capturing a different aspect. This study uses

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total assets because they reflect all resources the company controls, and the value is transformed with the natural logarithm. Following (Choi & Luo, 2021) company size is calculated as:

$$\boldsymbol{Company\ Size\ =\ Ln\ (Total\ Aset)}$$

Media exposure is the degree to which a company is covered by mass and online media, and it indicates the level of public attention, particularly on environmental matters (Florencia & Handoko, 2021). In this study, measurement is based on national online news outlets such as Kompas.com, Detik.com, CNN Indonesia, and others that explicitly mention the company name and discuss environmental issues or carbon emissions. Media exposure measurement uses the Janis-Fadner Coefficient (JFC) by (Li et al., 2017) and (Putri & Arieftiara, 2023) which assesses the tone of news coverage on a scale from -1 (negative) to +1 (positive). In the formula, **e** is the number of positive news items about the company, **c** is the number of negative items, and **t** is the total number of items (t = e + c). A value of 0 is assigned if the amount of positive and negative reports is equal, or if there is no relevant news. The formula used is as follows:

$$\mathbf{JFC} = \begin{cases} \dfrac{\boldsymbol{e^2 - ec}}{\boldsymbol{t^2}}, & \boldsymbol{e > c} \\ \dfrac{\mathbf{ec} - \boldsymbol{c^2}}{\boldsymbol{t^2}}, & \boldsymbol{c > e} \\ \mathbf{0}, & \boldsymbol{e = c} \end{cases}$$

Environmental performance describes how well a firm manages and protects the natural environment, and it reflects both responsibility for operational impacts and the ability to control them (Amaliyah & Solikhah, 2019). It is measured here by ISO 14001 certification. This certification is a standard for environmental management systems created to help organizations in managing their environmental aspects in a structured manner and improving their environmental performance. The measurement of environmental performance uses a dummy variable (Putri & Yuliandhari, 2024), a dummy variable is used: 1 for companies with ISO 14001 certification and 0 for those without.

There are several control variables in this study. The first is company age of a firm shows how long a company can sustain itself and maintain its competitiveness within the industry (Hapsoro, 2018). It is calculated as the difference between the reporting year and the year of establishment (Nguyen et al., 2023).

$$\boldsymbol{Company\ Age = Tahun\ Pelaporan\ Keuangan\ -\ Tahun\ Pendirian\ Perusahaan}$$

The second is profitability linked to how capable a company is in making profits (Mustar et al., 2020). This study employs a measure of profitability based on total assets namely, Return on Assets (ROA) as follows (Hidayat et al., 2022):

$$\boldsymbol{ROA\ =\ Net\ Profit\ After\ Tax\ /\ Total\ Assets}$$

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The third is leverage, which expresses the share of a company's assets that is financed by debt (Putri & Arieftiara, 2023). Leverage is derived from the ratio of a company's total debt to its total assets; this study specifically uses the Debt to Assets Ratio (DAR) as its metric, as follows (Putri & Arieftiara, 2023):

$$DAR = Total\ Debt / Total\ Assets$$

Panel data regression is used for the analysis. It estimates the effect of the independent variables on the dependent variable by combining cross-sectional and time-series data (Wooldridge, 2010). The use of this method allows for the control of unobserved differences in characteristics between firms, resulting in more accurate estimates. The model is specified as follows:

$$\mathbf{CEDit} = \alpha + \beta 1 SIZEit + \beta 2 MEit + \beta 3 EPit + \beta 4 AGEit + \beta 5 ROAit + \beta 6 LEVit + eit$$

RESULT AND DISCUSSION

Descriptive Statistical Analysis

Descriptive statistics summarize the data through the minimum, maximum, mean, and standard deviation (Ghozali, 2021). Table 3 presents the descriptive statistics for each variable:

Table 3. Descriptive Statistical Test

	CED	SIZE	ME	EP	AGE	ROA	LEV
Mean	0.175728	28.70426	0.545513	0.143590	29.77436	0.011903	0.362625
Median	0.200000	28.85000	1.000000	0.000000	32.00000	0.007700	0.338700
Maximum	0.600000	31.43000	1.000000	1.000000	47.00000	0.099300	0.827200
Minimum	0.000000	25.60000	-1.000000	0.000000	9.000000	-0.076500	0.039200
Std. Dev.	0.138810	1.673398	0.508240	0.351576	12.25251	0.044524	0.212992
Skewness	0.751670	-0.082405	-0.299665	2.032720	-0.344652	0.090397	0.516581
Kurtosis	3.180216	1.979961	1.389009	5.131950	1.759224	2.680378	2.644915
Jarque-Bera	18.62665	8.674585	24.00522	171.2182	16.36916	1.095615	9.697246
Probability	0.000090	0.013072	0.000006	0.000000	0.000279	0.578216	0.007839
Sum	34.26690	5597.330	106.3750	28.00000	5806.000	2.321100	70.71180
Sum Sq.	9.759667	161210.4	108.1406	28.00000	201994.0	0.412209	34.44279
Sum Sq. Dev.	3.738024	543.2504	50.11170	23.97949	29124.07	0.384581	8.800950
Observations	195	195	195	195	195	195	195

Source: Data Processed by EViews 14.0

Carbon Emission Disclosure (CED) has a low average of only 0.1757, which means companies on average reveal only about 17.6% of the 15 items, or around 2.6 items. The minimum of 0.0000 shows that some firm-years disclose no carbon information at all, and the maximum of 0.6000 (nine items) shows that no company has yet disclosed all items in full. A median of 0.2000 and a standard deviation of 0.1388 reflect disclosure practices that vary across companies but remain generally low. These

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findings indicate that, in the most recent period (2023–2025), Carbon Emission Disclosure in the property and real estate sector is far from complete, consistent with its current voluntary nature.

The mean Company Size (SIZE) is 28.7043, which corresponds to total assets of around IDR 2.9 trillion with a range from 25.6000 (about IDR 0.13 trillion) to 31.4300 (about IDR 44.7 trillion), indicating that the sample encompasses both small and large companies. Media Exposure (ME) has a mean of 0.5455 and a median of 1.0000 on a scale ranging from −1 to +1; the median value of +1 suggests that more than half of the firm-year observations feature entirely positive media coverage, while a value of −1 indicates entirely negative coverage. The mean Environmental Performance (EP) score of 0.1436 reflects that only 28 out of 195 companies (14.4%) hold ISO 14001 certification, demonstrating that formally recognized environmental performance remains uncommon.

Regarding the control variables, the mean company age is 29.7744, equivalent to approximately 26.6 years (ranging from about 9 to 47 years). The mean ROA is only 1.19%, with a minimum value of −7.65%, indicating that some firms recorded losses; meanwhile, the mean leverage of 0.3626 suggests that approximately 36.3% of assets are financed through debt. The Jarque-Bera test for each variable indicates that only ROA follows a normal distribution (Prob. 0.5782), whereas the other variables do not (Prob. < 0.05).

Classical Assumption Test and Model Selection Test

The purpose of classical assumption testing is to ensure that the regression equation obtained provides accurate, unbiased, and consistent estimates. The classical assumption testing in this study uses the Ordinary Least Squares (OLS) method, covering normality, heteroscedasticity, autocorrelation, and multicollinearity tests. In panel data regression, the relevant tests are multicollinearity and heteroscedasticity (Basuki & Prawoto, 2019).

Multicollinearity Test

The multicollinearity test examines whether independent variables are correlated with each other. This study measures multicollinearity using tolerance and VIF values, where a VIF < 10 indicates the absence of multicollinearity. As Table 4 shows, the Centered VIF values of all independent variables lie between 1.0817 and 1.4938, far below 10, so multicollinearity is not a concern.

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Table 4. Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.025915	384.1329	NA
SIZE	3.51E-05	430.5764	1.449903
ME	0.000284	2.334332	1.081715
EP	0.000656	1.395992	1.195542
AGE	5.18E-07	7.953716	1.146789
ROA	0.051111	1.601133	1.493839
LEV	0.002041	5.342738	1.365151

Source: Data Processed by EViews 14.0

Heteroskedasticity Test

The heteroscedasticity test examines whether the variance of the residuals differs across observations (Ghozali, 2021). The White test is used, where a probability of at least 0.05 signals the absence of heteroscedasticity. Table 5 reports a Prob. Chi-Square (Obs*R-squared) of 0.0608, which is above 0.05, so heteroscedasticity is not present. The F-statistic probability of 0.0497 lies close to the threshold, so the standard errors should be read with some caution.

Table 5. Heteroskedasticity Test

Heteroskedasticity Test: White
Null hypothesis: Homoskedasticity

F-statistic	1.562889	Prob. F(26,168)	0.0497
Obs*R-squared	37.97946	Prob. Chi-Square(26)	0.0608
Scaled explained SS	32.91876	Prob. Chi-Square(26)	0.1645

Source: Data Processed by EViews 14.0

Chow Test

The Chow test chooses between the common effect model and the fixed effect model. The results in Table 6 show a cross-section F-statistic probability of 0.0000, which is less than 0.05; therefore, H0 is rejected, so the fixed effect model is considered more appropriate. This is followed by the Hausman test.

Table 6. Chow Test

Redundant Fixed Effects Tests
Equation: FEM
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	9.438290	(64,124)	0.0000
Cross-section Chi-square	345.167345	64	0.0000

Source: Data Processed by EViews 14.0

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Hausman Test

The Hausman test decides between the fixed effect and the random effect model. Table 7 shows a probability value of 0.0000, which is less than 0.05, so H0 is rejected and the fixed effects model is selected as the suitable model.

Table 7. Hausman Test

Correlated Random Effects - Hausman Test
Equation: REM
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	58.019652	6	0.0000

Source: Data Processed by EViews 14.0

Both tests indicate that the Fixed Effect Model (FEM) is the model used in this study. The estimation results are presented in Table 8, and the regression equation is as follows:

$$CED = -3{,}4442 + 0{,}0339\ SIZE + 0{,}0273\ ME + 0{,}0886\ EP + 0{,}7784\ AGE + 0{,}2366\ ROA + 0{,}1670\ LEV + e$$

Table 8. Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.444214	1.688076	-2.040319	0.0434
SIZE	0.033927	0.057180	0.593337	0.5540
ME	0.027275	0.012073	2.259180	0.0256
EP	0.088553	0.037896	2.336776	0.0211
AGE	0.778413	0.121430	6.410405	0.0000
ROA	0.236599	0.237259	0.997221	0.3206
LEV	0.167047	0.112969	1.478701	0.1418

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.877499	Mean dependent var	0.175728
Adjusted R-squared	0.808346	S.D. dependent var	0.138810
S.E. of regression	0.060769	Akaike info criterion	-2.488000
Sum squared resid	0.457910	Schwarz criterion	-1.296293
Log likelihood	313.5800	Hannan-Quinn criter.	-2.005492
F-statistic	12.68915	Durbin-Watson stat	2.369474
Prob(F-statistic)	0.000000		

Source: Data Processed by EViews 14.0

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Regression Test Results

Coefficient of Determination Test (R2)

The coefficient of determination (R^2) ranges from 0 to 1. A value close to 1 means that the independent variables explain most of the variation in the dependent variable, while a value near 0 means they explain little. As shown in Table 8, the Adjusted R-squared value is 0.8083, or 80.8%. This means that the research model incorporating independent variables such as Company Size, Media Exposure, and Environmental Performance, along with control variables is capable of explaining 80.8% of the variation in Carbon Emission Disclosure, and the remaining 19.2% is due to factors outside the model.

F Statistical Test

The F-test assesses whether the independent variables jointly affect the dependent variable. In Table 8, the F-statistic probability is 0.0000, below 0.05, so H0 is rejected and Ha is accepted: the independent and control variables together affect Carbon Emission Disclosure.

T Statistical Test

The t-test examines the partial effect of each independent variable. Company Size (SIZE) has a probability of 0.5540 (> 0.05), so H0 is not rejected and Company Size has no effect on Carbon Emission Disclosure. Media Exposure (ME), with a probability of 0.0256, and Environmental Performance (EP), with a probability of 0.0211, are both below 0.05, so H0 is rejected for each of them and both significantly affect Carbon Emission Disclosure.

The Influence of Company Size on Carbon Emission Disclosure

Company Size has a positive coefficient (0.0339) but is not significant (Prob. 0.0554), so H1 is rejected. This finding is in line with (Wahyuningsih et al., 2023) and (Riantono & Sunarto, 2022) which also found that company size had no effect on Carbon Emissions Disclosure. This result differents from (Githaiga, 2025), (Abdullah et al., 2020), dan (Hidayat et al., 2022) who reported a positive effect, and it does not support the stakeholder and legitimacy theory argument that large firms, being more visible, feel more pressure to disclose emissions. Several explanations are possible. First, FEM relies only on changes within a firm over time. Because firm size changes little over three years and FEM removes differences between firms, the effect of size is hard to detect. Second, the average level of Carbon Emission Disclosure in this sector remains low at 17.6% meaning that no clear distinction in disclosure practices has yet emerged between large and small firms. Third, in the property sector, carbon emissions primarily stem from construction

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activities and the energy consumption of buildings; consequently, the level of public scrutiny directed at large companies in this sector differs from that in other sectors. These possibilities warrant further investigation in future research.

The Influence of Media Exposure on Carbon Emission Disclosure

Media Exposure has a positive effect on CED (coefficient 0.0273; Prob. 0.0256), so H2 is accepted. A one-unit increase in the Janis-Fadner coefficient is followed by an increase in the CED score of 0.0273 (approximately 0.4 out of 15 items), with other variables remaining constant. This result is consistent with (Hidayat et al., 2022), (Wahyuningrum et al., 2024), (Kiswanto et al., 2023), (Florencia & Handoko, 2021), and (Aini et al., 2021), as well as legitimacy theory and stakeholder theory, which posit that the media conveys public attention, thereby compelling companies to demonstrate their commitment and maintain legitimacy through disclosure. The novelty of this study lies in how media exposure is measured; while previous research has generally employed a dummy variable to indicate the presence or absence of media coverage, this study utilizes the Janis-Fadner coefficient (JFC), following the methodology of (Putri & Arieftiara, 2023) and (Li et al., 2017). JFC captures the direction and tonal balance of media coverage, rather than just its mere presence. For the majority of companies, the coverage is positive in tone (median +1); the observed effect is best interpreted as a relationship between favorable media attention and the breadth of Carbon Emission Disclosures.

The Influence of Environmental Performance on Carbon Emission Disclosure

Environmental Performance, measured by ISO 14001 certification, has a positive effect on CED (coefficient 0.0886; Prob. 0.0211), so H3 is accepted. Companies with certification reported approximately 0.0886 points higher CED scores (approximately 1.3 items out of 15) compared to those without certification. This finding is in line with (Hidayat et al., 2022), (Kiswanto et al., 2023), and (Salsabila & Purwasih, 2023), and supports the view that companies with good environmental performance are motivated to communicate this to stakeholders to gain and maintain legitimacy. These results differ from (Abdullah et al., 2020) which found a negative influence, as poorly performing companies actually engage in more extensive disclosure to maintain public trust. In the property and real estate sector, the perspective that strong performance drives disclosure appears more applicable. From a practical standpoint, certified environmental management systems also provide data and procedures that facilitate the disclosure of emissions. This study uses ISO 14001 certification as an indicator, with only 14.4% of the observations holding such certification. However, it should be noted that ISO 14001

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certification merely measures the existence of a company's environmental management system, rather than its actual achievements in reducing carbon emissions.

Control Variable

Company Age (AGE) has a significant positive effect (coefficient 0.7784; Prob. 0.0000), while ROA and Leverage are not significant. The result for AGE can be interpreted to mean that firms with a longer operating history possess greater experience in the reporting process and in responding to the information needs of stakeholders, although this mechanism was not directly tested (Setiany et al., 2022). The insignificance of ROA may be linked to the low profitability of the sample (averaging 1.19%), which could stem from the companies being more profit-oriented without paying sufficient attention to their environmental responsibilities (Wahyuningrum et al., 2024). Leverage is also insignificant, which may suggest that firms prioritize meeting obligations to creditors over disclosing carbon emissions (Putri & Arieftiara, 2023).

CONCLUSION

The present study analyzes how company Size, Media Exposure, and Environmental Performance affect Carbon Emission Disclosure (CED) among 65 property and real estate companies listed on the Indonesia Stock Exchange (IDX) during 2023–2025, using 195 observations and a fixed-effect panel regression. The results show that (1) Company Size has an insignificant effect, therefore H1 is not supported; (2) Media Exposure has a significant positive impact, thus H2 is accepted; and (3) Environmental Performance based on ISO 14001 certification shows a significant positive influence, supporting H3. The model explains 80.8% of the variation in CED, and all three independent variables, along with the control variables, exert a simultaneous influence. Descriptively, the average CED score is only 17.6% out of 15 items, suggesting that Carbon Emission Disclosure in this sector remains low. The study covers one sector and a three-year period, so the findings cannot be generalized. Environmental Performance is proxied by an ISO 14001 dummy variable, and causal relationships, particularly for Media Exposure, cannot be established firmly. It is recommended that future research (1) lengthen the observation period and broaden sector coverage to improve variation across firms, and (2) incorporate other measures of Environmental Performance, such as PROPER ratings or emission intensity.

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