

Article Type: Research Paper

Environmental Performance, Corporate Governance, and Carbon Emission Disclosure: Evidence from Indonesian Transportation and Logistics Companies

T. Naswa Natasha Vergiawan^{1*}, Hardi², Eka Hariyani³

AFFILIATION:

^{1,2,3}Department of
Accounting, Faculty of
Economics and Business,
University of Riau,
Pekanbaru, Indonesia

***CORRESPONDENCE:**
natashanaswa@gmail.com

ARTICLE HISTORY

Received:

2026-05-04

Revised:

2026-06-18

2026-06-24

Accepted:

2026-06-25

Abstract:

Purpose – This study examines the effect of environmental performance and corporate governance on carbon emission disclosure among transportation and logistics companies listed on the Indonesia Stock Exchange (IDX). The transportation sector is a major contributor to carbon emissions, yet evidence on disclosure practices within this industry remains limited.

Design/Methodology/Approach – A quantitative approach was employed using secondary data from annual and sustainability reports of transportation and logistics companies during 2022–2024. The sample was selected through purposive sampling, and the data were analyzed using regression analysis.

Findings – The results indicate that environmental performance and corporate governance positively influence carbon emission disclosure. Companies with stronger environmental commitments and better governance practices tend to provide more extensive carbon-related information.

Theoretical Contribution/Originality – This study contributes to the carbon disclosure literature by providing evidence from the transportation and logistics sector and by highlighting the complementary roles of environmental responsibility and governance mechanisms in enhancing disclosure practices.

Practical Implications – The findings suggest that strengthening environmental management and corporate governance can improve transparency and accountability in carbon emission reporting.

Limitations – Environmental performance is measured using ISO 14001 implementation and certification status, while the study focuses only on transportation and logistics companies, limiting the generalizability of the findings.

Keywords: Carbon Emission Disclosure; Environmental Performance; Corporate Governance; Transportation and Logistics Companies.

Introduction

Climate change is driven by increasing global warming caused by carbon emissions and other greenhouse gases (GHGs), such as carbon dioxide, methane, chlorofluorocarbons (CFCs), and nitrous oxide, which trigger various natural disasters including droughts, crop failures, storms, and hurricanes (Melja et al., 2022). According to the Global Carbon Budget 2024, carbon emissions from fossil fuel consumption are projected to reach 37.4 billion tons of CO₂, an increase of 0.8%, with the largest sources originating from coal (41%) and oil (32%), which are the primary energy sources in the industrial and transportation sectors (Kusumaningtyas, 2024). In Indonesia, the transportation sector is a major contributor to greenhouse gas emissions. Data

from the Institute for Essential Services Reform (IESR, 2025) show that this sector generates approximately 202 million tons of CO₂ equivalent, accounting for 25% of total national energy emissions.

In reality, mitigation efforts in Indonesia's transportation sector still face significant challenges, including the absence of standardized carbon emission regulations for vehicle manufacturers, slow adoption of electric buses, and the continued use of high-sulfur fuels that are environmentally harmful (Medcom.id, 2024). Furthermore, a study by WRI Indonesia and LAPI ITB (2025) reveals that heavy vehicles such as trucks and buses, although representing only 3.9% of the total vehicle population, contribute approximately 35.6% of total land transportation emissions and significantly worsen air pollution (Kompas.com, 2025). This condition reflects the limited effectiveness of emission reduction policies and the low level of corporate transparency in disclosing carbon emission data.

One way for companies to demonstrate environmental responsibility is through carbon emission disclosure in annual and sustainability reports (Dhamayanti & Restuningdiah, 2022). This disclosure includes both quantitative and qualitative information on carbon emissions, covering past performance, future projections, and their financial implications (Alfayerds & Setiawan, 2021). Carbon emission disclosure reflects a company's commitment to environmental sustainability, as carbon emissions contribute to global warming, declining air quality, and ecosystem imbalance (Wirawan & Setijaningsih, 2022). However, in practice, the level of carbon emission disclosure in Indonesia remains relatively low due to its voluntary nature, resulting in incomplete and inconsistent reporting among companies (Setiawan et al., 2022).

Beyond its environmental significance, carbon emission disclosure has emerged as an important mechanism of corporate accountability and transparency. Climate-related information is increasingly demanded by investors, creditors, regulators, and other stakeholders because carbon emissions expose firms to regulatory, reputational, and financial risks. Consequently, carbon emission disclosure serves not only as an environmental communication tool but also as a strategic reporting mechanism that reduces information asymmetry and enables stakeholders to assess a firm's sustainability performance and long-term value creation. As climate-related risks become increasingly material to business operations, the quality of carbon emission disclosure has become an important indicator of corporate transparency and accountability.

The transportation and logistics sector represents a particularly relevant context for examining carbon emission disclosure. Unlike many other industries, transportation and logistics companies generate emissions directly through fuel consumption, fleet operations, freight transportation, and distribution activities. These operational characteristics make the sector one of the largest contributors to carbon emissions while simultaneously increasing public scrutiny regarding environmental responsibility. Consequently, transportation and logistics firms face stronger legitimacy pressures and greater stakeholder demands for transparent climate-related reporting. Despite the sector's significant environmental impact, empirical evidence concerning the determinants of carbon emission disclosure within transportation and logistics companies remains relatively limited.

Legitimacy Theory, proposed by Dowling and Pfeffer (1975), suggests that organizations seek to align their activities with societal norms and expectations in order to maintain legitimacy. Carbon emission disclosure can therefore be viewed as a mechanism through which companies communicate their environmental responsibility and demonstrate compliance with stakeholder expectations. Similarly, Stakeholder Theory argues that organizations must respond to the interests and information needs of various stakeholder groups, including investors, regulators, customers, and communities (Freeman, 1984). From this perspective, carbon emission disclosure serves as an important instrument for enhancing transparency and maintaining stakeholder trust.

Although previous studies have extensively investigated carbon emission disclosure, several important gaps remain unresolved. First, prior research has predominantly focused on manufacturing, mining, and energy companies, while evidence from transportation and logistics firms remains scarce despite their substantial contribution to greenhouse gas emissions. Second, existing studies report mixed findings regarding the influence of environmental performance and corporate governance on carbon emission disclosure, indicating that the relationship may be context-dependent. Third, most prior studies examine environmental performance and governance as separate determinants of disclosure without adequately explaining which mechanism plays a more dominant role in encouraging corporate transparency. Finally, limited research has explored these relationships within emerging economies such as Indonesia, where carbon disclosure remains largely voluntary and institutional pressures differ from those observed in developed countries.

Environmental performance reflects a company's ability to manage environmental impacts and implement environmentally responsible business practices. Firms with stronger environmental performance are expected to disclose carbon emission information more extensively because such disclosure signals commitment to sustainability and environmental stewardship. Prior studies provide evidence that environmental performance positively influences carbon emission disclosure (Desiana et al., 2025; Rahmawaty et al., 2024). However, other studies report insignificant relationships, suggesting that environmental initiatives do not always translate into greater disclosure practices (Putri & Trisnawati, 2023; Suhardi, 2025).

Corporate governance represents a system of structures, processes, and mechanisms designed to ensure accountability, transparency, and effective oversight of corporate activities. Strong governance mechanisms can encourage management to provide more comprehensive environmental disclosures because transparency reduces agency conflicts and enhances stakeholder confidence. Previous studies generally suggest that better corporate governance promotes broader carbon emission disclosure (Firmansyah et al., 2021; Primalia et al., 2025), although some studies report contradictory findings (Mawarti & Murwaningsari, 2024; Kusumajaya & Budiasih, 2025).

Drawing upon Legitimacy Theory and Stakeholder Theory, this study examines the effects of environmental performance and corporate governance on carbon emission disclosure among transportation and logistics companies listed on the Indonesia Stock Exchange during the 2022–2024 period. This study contributes to the literature in three ways. First, it extends carbon disclosure research by providing evidence from a high-emission sector that remains underexplored in prior studies. Second, it offers a more comprehensive explanation of carbon

disclosure behavior by integrating environmental responsibility and governance perspectives within a single analytical framework. Third, it provides empirical evidence from an emerging-market setting where carbon disclosure practices remain largely voluntary, thereby enriching the international literature on sustainability reporting and environmental accountability.

Literature Review and Hypotheses Development

Legitimacy Theory

Legitimacy Theory, introduced by Dowling and Pfeffer (1975), argues that organizational survival depends on the extent to which corporate activities are perceived as consistent with prevailing social values, norms, and expectations. Organizations continuously seek legitimacy because societal acceptance provides access to critical resources and supports long-term sustainability (Subroto & Endaryati, 2024). When a legitimacy gap emerges between organizational activities and stakeholder expectations, companies are more likely to increase disclosure efforts to demonstrate accountability and regain public trust.

In the context of environmental accountability, carbon emission disclosure serves as an important legitimacy mechanism through which firms communicate their environmental commitments and sustainability initiatives. As climate change becomes a major societal concern, organizations face increasing pressure to provide transparent information regarding their environmental impacts. Consequently, carbon emission disclosure enables firms to demonstrate conformity with societal expectations, reduce legitimacy threats, and maintain their social license to operate (Luo et al., 2019).

Stakeholder Theory

Stakeholder Theory, developed by Freeman (1984), posits that organizations are accountable not only to shareholders but also to a broader group of stakeholders, including regulators, investors, creditors, customers, employees, communities, and environmental advocacy groups. These stakeholders influence organizational success and increasingly demand information regarding corporate environmental performance and sustainability practices.

From a stakeholder perspective, carbon emission disclosure represents a strategic response to growing stakeholder demand for climate-related information. Stakeholders increasingly evaluate firms based not only on financial performance but also on environmental responsibility and sustainability commitments. Consequently, companies are encouraged to disclose carbon-related information to reduce information asymmetry, strengthen stakeholder relationships, and enhance transparency regarding environmental risks and performance.

Environmental Performance and Carbon Emission Disclosure

Environmental performance reflects a company's ability to manage environmental impacts, comply with environmental standards, and implement sustainable business practices (Guang-Wen & Siddik, 2022). Firms with superior environmental performance generally possess

stronger environmental management systems and are better positioned to demonstrate environmental responsibility to stakeholders.

According to Legitimacy Theory, companies with strong environmental performance have greater incentives to disclose carbon emission information because disclosure enables them to communicate environmental achievements and strengthen organizational legitimacy. Firms that actively implement environmental initiatives are more likely to publicize these efforts to demonstrate compliance with environmental norms and differentiate themselves from competitors. Carbon emission disclosure therefore becomes a mechanism through which environmental achievements are translated into reputational and legitimacy benefits.

Stakeholder Theory further suggests that stakeholders increasingly demand credible information regarding environmental performance and carbon management practices. Companies with stronger environmental performance are therefore more likely to respond to these information demands through broader carbon emission disclosure. Such disclosure enables stakeholders to assess environmental commitment, evaluate sustainability performance, and make informed decisions.

Previous studies generally report a positive relationship between environmental performance and carbon emission disclosure (Desiana et al., 2025; Rahmawaty et al., 2024). These studies argue that firms with stronger environmental performance tend to disclose carbon information more extensively because they have positive environmental achievements to communicate. However, other studies report insignificant relationships (Putri & Trisnawati, 2023; Suhardi, 2025), suggesting that environmental initiatives do not always translate into broader disclosure practices. Such inconsistencies indicate that the relationship remains context-dependent and warrants further examination, particularly within transportation and logistics companies.

Based on the foregoing arguments, the following hypothesis is proposed:

H1: Environmental performance positively affects carbon emission disclosure.

Corporate Governance and Carbon Emission Disclosure

Corporate governance refers to the structures, systems, and processes used to direct and monitor corporate activities in accordance with the principles of transparency, accountability, responsibility, independence, and fairness (Primalia et al., 2025). Effective governance mechanisms reduce agency conflicts, improve oversight quality, and encourage transparent reporting practices.

In this study, corporate governance is conceptualized as an integrated governance system measured through the OJK Corporate Governance Index, which captures compliance with governance principles across multiple dimensions. This approach provides a more comprehensive assessment of governance quality than examining individual governance mechanisms separately because environmental disclosure decisions are influenced by the overall governance environment.

From the perspective of Legitimacy Theory, effective governance enhances organizational credibility and encourages firms to disclose environmental information as a means of demonstrating accountability and maintaining legitimacy. Governance structures establish

monitoring mechanisms that promote transparency and reduce managerial incentives to withhold information related to environmental risks and impacts.

Stakeholder Theory further suggests that governance systems facilitate responsiveness to stakeholder expectations. Firms with stronger governance structures are better able to identify stakeholder information needs and provide relevant environmental disclosures. Consequently, effective governance is expected to improve both the quantity and quality of carbon emission disclosure.

Empirical evidence generally supports a positive relationship between corporate governance and carbon emission disclosure (Firmansyah et al., 2021; Primalia et al., 2025). These studies suggest that stronger governance mechanisms promote transparency and accountability in sustainability reporting. Nevertheless, several studies report insignificant findings (Mawarti & Murwaningsari, 2024; Kusumajaya & Budiasih, 2025), indicating that governance quality may not always translate into broader disclosure practices and that contextual factors may influence this relationship.

Given the theoretical arguments and mixed empirical evidence, further investigation is required to understand the role of governance quality in shaping carbon emission disclosure practices within transportation and logistics companies.

Accordingly, the following hypothesis is proposed:

H2: Corporate governance positively affects carbon emission disclosure.

Research Method

Research Design and Sample Selection

This study adopts a quantitative approach to examine the effect of environmental performance and corporate governance on carbon emission disclosure. The research focuses on transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period.

The population of this study consists of all firms classified under the transportation and logistics sector listed on the Indonesia Stock Exchange (IDX). A purposive sampling technique is employed to ensure data consistency and comparability. Firms are included in the sample if they meet the following criteria: (1) transportation and logistics companies that were consistently listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period; and (2) transportation and logistics companies that consistently published annual reports or financial statements throughout the 2022–2024 period.

The final sample consists of 31 companies observed over a three-year period, resulting in 93 firm-year observations. Because the dataset combines cross-sectional and time-series dimensions, it is treated as panel data. Panel data analysis provides several advantages,

including controlling for unobservable firm-specific heterogeneity and improving the efficiency of statistical estimation (Wooldridge, 2021).

Variable Measurement

Carbon Emission Disclosure

Carbon emission disclosure refers to the reporting of information related to climate change (Arsy and Amin, 2025). The level of carbon emission disclosure is measured by dividing the number of disclosure items reported by the company by the total number of disclosure items recommended by the Carbon Disclosure Project (CDP), which consists of 18 identification items that should be addressed by companies, as adopted from the method used by Choi *et al.*, (2013). The formula used to measure carbon emission disclosure is as follows:

$$CED = \frac{\sum d_i}{M}$$

Environmental Performance

Environmental performance reflects the extent to which a company is able to maintain and create a clean and environmentally friendly environment (Amaliyah & Solikhah, 2019). In this study, environmental performance is measured using the implementation and certification of ISO 14001, an internationally recognized environmental management standard that reflects a firm's commitment to systematic environmental management and continuous improvement. The measurement is based on a scoring system, where a value of 1 is assigned to companies that implement ISO 14001, a value of 2 to companies that have obtained ISO 14001 certification, and a value of 0 to companies that neither implement nor are certified under ISO 14001. Although ISO 14001 is widely used as a proxy for environmental performance, it primarily measures environmental management practices rather than actual environmental outcomes such as carbon emission reductions.

Corporate Governance

Corporate governance refers to the set of rules that regulate how various stakeholders within a company interact with one another and function as a determinant of the organization's direction and policies Mawarti and Murwaningsari, (2024) To measure corporate governance, this study adopts the approach used by Mawarti and Murwaningsari, (2024), which utilizes indicators issued by the Otoritas Jasa Keuangan (OJK) through Circular Letter No. 32/SEOJK.04/2015, consisting of 5 main aspects, 8 principles, and 25 compliance checklist items.

$$CG = \frac{n}{k}$$

Firm Size

Firm size is included as a control variable because larger firms generally possess greater resources and face higher public and stakeholder scrutiny, leading to broader environmental disclosure practices. Firm size is measured using the natural logarithm (Ln) of total assets

(Efendy et al., 2023). The natural logarithm is used to reduce disparities between large and small firms and to improve the normality of the data distribution. Total assets are selected as a proxy because they represent the overall resources controlled by the company.

$$Size = \ln(\text{Total Assets})$$

Profitability

Profitability is included as a control variable because firms with stronger financial performance generally have greater capacity to invest in environmental initiatives and provide more extensive voluntary disclosures, including carbon emission information (Arsy & Amin, 2025). Profitability is measured using Return on Assets (ROA), which reflects a company's ability to generate profit from its total assets. The formula used in this study is as follows:

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$$

Data Analysis Technique

This study employs statistical data analysis techniques using statistical software. The method used includes descriptive statistical analysis, which aims to provide an overview of the characteristics of each variable examined. To ensure the accuracy of the regression model used in the analysis, several classical assumption tests are conducted. These tests include normality, multicollinearity, autocorrelation, and heteroscedasticity tests. Furthermore, multiple linear regression analysis is applied to examine the effect of independent variables on the dependent variable.

Result

Descriptive Analysis

Descriptive analysis is a stage of data processing used to provide an overview or sufficient evidence as a basis for drawing research conclusions. In this study, descriptive statistics are used to measure or calculate the mean, minimum, maximum, and standard deviation values. The following are the results of the descriptive statistical test:

Table 1. Descriptive Analysis

<i>Residual Statistics</i>					
	N	Minimum	Maximum	Mean	Std. Deviation
<i>CED</i>	93	.4444	.9444	.6744	.1160
<i>KL</i>	93	1	2	1.39	.490
<i>TKP</i>	93	.45	1.29	.9127	.16113
<i>UP</i>	93	22.6537	32.3541	27.1489	2.0449
<i>PROFIT</i>	93	-.094844	.276028	.02214398	.059599484
<i>Valid N (listwise)</i>	93				

Source: Processed Data, 2026

The results show the minimum, maximum, mean, and standard deviation values of the variables examined in transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period, with a total of 31 companies. The dependent variable, carbon emission disclosure, has a minimum value of 0.4444 and a maximum value of 0.9444. The mean value of this variable is 0.6744, with a standard deviation of 0.1160. The independent variable environmental performance has a minimum value of 1 and a maximum value of 2, with a mean of 1.39 and a standard deviation of 0.49. Corporate governance has a minimum value of 0.45 and a maximum value of 1.29, with a mean of 0.91 and a standard deviation of 0.16. The control variable, firm size, records a minimum value of 22.6537, a maximum value of 32.3541, a mean of 27.1489, and a standard deviation of 2.0449. Meanwhile, profitability shows a minimum value of -0.094844, a maximum value of 0.276028, a mean of 0.02214398, and a standard deviation of 0.059599484.

Normality Test

In this study, the normality of the residuals is tested using the nonparametric Kolmogorov–Smirnov (K-S) statistical test in Table 2.

Table 2. Normality Test		
One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		93
Normal	Mean	.0000000
Parameters ^{a,b}	Std. Deviation	.09147863
Most Extreme	Absolute	.078
Differences	Positive	.078
	Negative	-.057
Test Statistic		.078
Asymp. Sig. (2-tailed)		.200 ^{c,d}

Source: Processed Data, 2026

Based on the test results, the Asymp. Sig. (2-tailed) value is 0.200. This significance value is greater than the 0.05 significance level, indicating that there is no significant difference between the distribution of the residuals and a normal distribution. Therefore, the residuals in this regression model can be considered normally distributed.

Multicollinearity Test

The multicollinearity test aims to determine whether there is a relationship or correlation among the independent variables used in the study. This test is conducted by examining the tolerance values and the Variance Inflation Factor (VIF).

Table 3. Multicollinearity Test

<i>Coefficients^a</i>								
<i>Model</i>	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>	<i>Collinearity Statistic</i>		
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>			<i>Tolerance</i>	<i>VIF</i>	
1 <i>(Constant)</i>	.181	.073		2.464	.016			
<i>KL</i>	.073	.020	.310	3.675	.000	.992	1.008	
<i>TKP</i>	.369	.061	.512	6.072	.000	.993	1.008	
<i>UP</i>	2.284	.000	.138	1.616	.110	.974	1.026	
<i>PROFIT</i>	-1.319	.000	.068	-.792	.431	.964	1.037	
<i>a. Dependent Variable: CED</i>								

a. Dependent Variable: CED

Source: Processed Data, 2026

Based on the table above, all independent variables have VIF values below 10 and tolerance values above 0.1. Therefore, it can be concluded that there is no multicollinearity among the independent variables.

Heteroscedasticity Test

The heteroscedasticity test aims to examine whether the variance of the residuals in the regression model is constant or varies across observations. In this study, the heteroscedasticity test is conducted using the Glejser test.

Table 4. Heteroscedasticity Test

<i>Model</i>	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
1 <i>(Constant)</i>	.098	.043		2.314	.023
<i>KL</i>	.006	.012	.054	.532	.596
<i>TKP</i>	-.065	.035	-.188	-1.845	.068
<i>UP</i>	1.089	.000	.137	1.332	.186
<i>PROFIT</i>	-1.367	.000	-.147	-1.417	.160

a. Dependent Variable: ABS_RES

Source: Processed Data, 2026

Based on the table above, it is found that the significance (Sig.) values for all variables are above 0.05. Therefore, it can be concluded that there is no heteroscedasticity problem in the regression model.

Autocorrelation Test

The autocorrelation test is essentially used to examine whether, in a linear regression model, there is a correlation between the disturbance errors in period t and the errors in period t-1 (the previous period). In this study, the autocorrelation test is conducted using the Durbin–Watson method.

Table 5. Autocorrelation Test

<i>Model Summary^b</i>					
<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>	<i>Durbin-Watson</i>
1	.615 ^a	.378	.350	.0935345902	.731

a. Predictors: (Constant), PROFIT, TKP, KL, UP

b. Dependent Variable: CED

Source: Processed Data, 2026

Based on the table above, it can be concluded that the Durbin–Watson value is 0.731. This value meets the criterion of $-2 < 0.731 < 2$; therefore, it can be concluded that there is no autocorrelation in the regression model.

Multiple Linear Regression Analysis

Multiple linear regression analysis aims to examine the effect of the independent variables on the dependent variable. The regression test is used to assess the regression coefficients, namely the t-statistic value and the significance value. To determine the multiple regression equation examining the effect of Environmental Performance and Corporate Governance on Carbon Emission Disclosure, with Firm Size and Profitability as control variables, a regression coefficient analysis is conducted as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 SIZE + \beta_4 PROF + e$$

$$Y = 0,181 + 0,073X_1 + 0,369X_2 + 2,284SIZE - 1,319PROF + e$$

Coefficient of Determination (R²)

The coefficient of determination (R²) is used to determine the extent to which the regression model is able to explain the dependent variable.

Table 6. Coefficient of Determination

<i>Model Summary^b</i>				
<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
1	.615 ^a	.378	.350	.0935345902

a. Predictors: (Constant), PROFIT, TKP, KL, UP

b. Dependent Variable: CED

Source: Processed Data, 2026

The adjusted R² value of 35% indicates that a substantial proportion of variation in carbon emission disclosure remains unexplained by the variables included in this study. This finding suggests that carbon disclosure is a multidimensional phenomenon influenced by additional factors such as carbon intensity, institutional ownership, foreign ownership, media exposure, ESG pressure, and regulatory expectations. Therefore, future research should incorporate these variables to obtain a more comprehensive understanding of disclosure behavior.

T-Test

The t-test is a statistical method used to examine whether a particular independent variable has a significant effect on the dependent variable in a multiple linear regression model, while controlling for other independent variables.

Table 7. T-Test

Coefficients^a								
<i>Model</i>	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>	<i>Collinearity Statistic</i>		
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>			<i>Tolerance</i>	<i>VIF</i>	
1 <i>(Constant)</i>	.181	.073		2.464	.016			
<i>KL</i>	.073	.020	.310	3.675	.000	.992	1.008	
<i>TKP</i>	.369	.061	.512	6.072	.000	.993	1.008	
<i>UP</i>	2.284	.000	.138	1.616	.110	.974	1.026	
<i>PROFIT</i>	-1.319	.000	.068	-.792	.431	.964	1.037	

a. Dependent Variable: CED

Source: Processed Data, 2026

Environmental Performance has a t-statistic value of 3.675 with a significance value of 0.000, which is lower than 0.05. Therefore, H0 is rejected and H1 is accepted, indicating that environmental performance has a significant effect on carbon emission disclosure. This suggests that the better the company's environmental performance, the higher the level of carbon emission disclosure. Corporate Governance has a t-statistic value of 6.072 with a significance value of 0.000, which is lower than 0.05. Thus, H0 is rejected and H1 is accepted. It can be concluded that corporate governance has a significant effect on carbon emission disclosure. This indicates that the better the implementation of corporate governance, the broader the carbon emission disclosure carried out by the company.

This section contains the data characteristic of subject/object/sample/respondent, data analysis result, instrument, and hypothesis testing results, the answer to the research question, findings, and interpretation. This section, if possible, can be graphed for each research variable. Furthermore, the descriptive statistic value was presented (e.g., Mean, SD, Maximum, Minimum) with its interpretation. At the end of the section showed the hypothesis research result and its discussion completely. In the discussion part, the manuscript should compare the research results with previous research results. Research implications and future direction are allowed to be presented.

Discussion

Environmental Performance and Carbon Emission Disclosure

The results indicate that environmental performance has a positive and significant effect on carbon emission disclosure. This finding suggests that companies with stronger environmental commitments tend to provide more extensive information regarding their carbon emissions and

environmental impacts. Firms that implement environmental management practices are generally more willing to disclose climate-related information because such disclosure enables them to communicate their environmental achievements and demonstrate accountability to stakeholders.

Beyond confirming previous empirical findings, the results suggest that environmental performance functions as a signaling mechanism through which firms communicate their environmental responsibility to external stakeholders. Companies that actively implement environmental management systems are more likely to disclose carbon-related information because disclosure allows them to transform environmental initiatives into reputational and legitimacy benefits. Through broader carbon emission disclosure, firms can demonstrate accountability, strengthen stakeholder trust, and enhance their environmental credibility.

The findings support Legitimacy Theory, which argues that organizations seek to maintain alignment between their activities and societal expectations. As public awareness of climate change continues to increase, companies face growing pressure to demonstrate environmental responsibility. Carbon emission disclosure therefore becomes an important mechanism through which firms communicate their commitment to environmental sustainability and maintain organizational legitimacy. By voluntarily disclosing carbon-related information, companies seek to reduce legitimacy risks, enhance public confidence, and strengthen their reputation among stakeholders.

The results are also consistent with Stakeholder Theory, which emphasizes the importance of responding to stakeholder information needs. Investors, regulators, creditors, customers, and society increasingly require transparent information regarding environmental risks and sustainability performance. Consequently, companies with stronger environmental performance tend to provide broader carbon emission disclosures to reduce information asymmetry and satisfy stakeholder demands for environmental accountability.

This finding is consistent with the studies of Desiana et al. (2025) and Rahmawaty et al. (2024), which report a positive relationship between environmental performance and carbon emission disclosure. Companies with superior environmental performance generally have stronger incentives to communicate their environmental achievements because such disclosure serves as both a transparency mechanism and a signal of environmental commitment. However, the findings differ from those reported by Putri and Trisnawati (2023) and Suhardi (2025), who found no significant relationship between environmental performance and carbon emission disclosure. These differences suggest that the relationship may vary across industries, institutional environments, and stakeholder pressures.

The transportation and logistics sector provides a particularly relevant context for this relationship. Unlike many other industries, transportation and logistics companies generate emissions directly through fuel consumption, fleet operations, freight transportation, and distribution activities. These operational characteristics expose firms to greater scrutiny regarding their environmental impacts. As a result, companies with stronger environmental performance have greater incentives to disclose carbon-related information in order to demonstrate environmental responsibility, maintain stakeholder confidence, and preserve organizational legitimacy.

These findings also suggest that carbon emission disclosure may reflect both substantive environmental accountability and legitimacy-driven reporting behavior. While companies with stronger environmental performance disclose carbon information to demonstrate environmental responsibility, the voluntary nature of carbon reporting in Indonesia also allows disclosure to function as a strategy for enhancing corporate reputation and meeting stakeholder expectations. Therefore, broader carbon emission disclosure should be interpreted as both an accountability mechanism and a legitimacy response to increasing climate-related pressures.

Corporate Governance and Carbon Emission Disclosure

The findings further reveal that corporate governance has a positive and significant effect on carbon emission disclosure. This result indicates that companies with stronger governance systems tend to disclose more comprehensive information regarding carbon emissions and environmental sustainability practices. Effective governance mechanisms encourage transparency, strengthen accountability, and improve the quality of corporate reporting.

An important finding of this study is that corporate governance demonstrates a stronger influence on carbon emission disclosure than environmental performance. This suggests that disclosure decisions are influenced not only by environmental initiatives but also by governance systems that oversee transparency, accountability, and reporting quality. Strong governance structures encourage management to disclose climate-related information more comprehensively because governance mechanisms reduce information asymmetry and improve responsiveness to stakeholder expectations.

From the perspective of Legitimacy Theory, corporate governance serves as a mechanism that enables organizations to maintain legitimacy by promoting transparent and accountable reporting practices. Companies with effective governance systems are more capable of demonstrating responsible corporate behavior through comprehensive environmental disclosures. Carbon emission disclosure therefore functions not only as an environmental communication tool but also as evidence of good governance implementation.

Stakeholder Theory also provides support for this finding. Effective governance systems facilitate communication between management and stakeholders and improve the company's ability to identify and respond to stakeholder information needs. As climate-related risks become increasingly important to investors, regulators, and society, companies with stronger governance systems are more likely to provide broader carbon emission disclosures to strengthen accountability and maintain stakeholder trust.

The findings support those of Firmansyah et al. (2021) and Primalia et al. (2025), who found that stronger corporate governance promotes broader environmental disclosure. Effective governance systems encourage management to adopt transparent reporting practices and communicate environmental information more comprehensively. However, the findings differ from those of Mawarti and Murwaningsari (2024) and Kusumajaya and Budiasih (2025), who reported no significant relationship between governance quality and carbon emission disclosure. These differences may reflect variations in governance effectiveness, institutional environments, and stakeholder expectations across industries and countries.

For transportation and logistics companies, governance quality appears particularly important because environmental risks are directly linked to operational activities. Strong governance systems can encourage management to adopt more transparent reporting practices and provide stakeholders with more comprehensive information regarding carbon emissions and environmental performance. Therefore, governance quality becomes a critical driver of climate-related transparency within carbon-intensive industries.

The coefficient of determination indicates that environmental performance, corporate governance, firm size, and profitability explain 35% of the variation in carbon emission disclosure. Although this level of explanatory power is acceptable for studies examining corporate disclosure behavior, it also suggests that a substantial proportion of variation remains unexplained. Carbon emission disclosure is a multidimensional phenomenon that may be influenced by additional factors not included in this study, such as carbon intensity, ownership structure, media exposure, ESG pressures, regulatory expectations, and stakeholder activism.

Therefore, the findings should be interpreted within the scope of the variables examined. The results demonstrate that environmental performance and corporate governance are important determinants of carbon emission disclosure, yet they do not fully explain disclosure behavior. Future research is encouraged to incorporate additional organizational, governance, and external pressure variables to provide a more comprehensive understanding of the factors influencing carbon emission disclosure practices, particularly in emerging economies where sustainability reporting remains largely voluntary.

The stronger influence of corporate governance compared to environmental performance indicates that governance mechanisms play an important role in shaping disclosure behavior. However, stronger disclosure does not necessarily imply superior environmental performance. Instead, governance systems may institutionalize transparency practices that enhance organizational legitimacy and respond to increasing stakeholder demands for climate-related information.

Conclusion

This study aims to analyze the effect of environmental performance and corporate governance on carbon emission disclosure in transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. The results show that environmental performance and corporate governance have a significant positive effect on carbon emission disclosure.

The findings indicate that carbon emission disclosure within transportation and logistics companies reflects both substantive environmental accountability and legitimacy-driven reporting behavior. While firms with stronger environmental management and governance systems disclose more carbon-related information, such disclosure may simultaneously function as a strategic communication mechanism designed to strengthen corporate legitimacy and stakeholder confidence.

This study contributes to the carbon disclosure literature by providing empirical evidence from the transportation and logistics sector, one of the largest contributors to carbon emissions but a relatively underexplored context in prior research. The findings demonstrate that both environmental responsibility and governance quality play important roles in enhancing corporate transparency regarding climate-related information. Furthermore, the results indicate that corporate governance exerts a stronger influence on carbon emission disclosure than environmental performance, highlighting the importance of governance systems in promoting environmental accountability and reporting transparency.

From a theoretical perspective, the findings support Legitimacy Theory by suggesting that companies disclose carbon emission information to demonstrate alignment with societal expectations regarding environmental responsibility. The results also support Stakeholder Theory, which emphasizes that firms respond to increasing stakeholder demands for climate-related information through broader environmental disclosure practices. Together, these theories provide a complementary explanation of carbon emission disclosure behavior within carbon-intensive industries.

Practically, the findings suggest that companies should strengthen both environmental management practices and governance systems to improve the quality and transparency of carbon emission disclosure. For regulators, the results provide evidence that governance quality plays a crucial role in encouraging climate-related transparency and may therefore be considered in the development of sustainability reporting policies and disclosure guidelines.

This study has several limitations. First, environmental performance is measured using ISO 14001 implementation and certification status, which may not fully capture actual environmental outcomes. Second, carbon emission disclosure is measured using the Carbon Disclosure Project (CDP) index, which focuses on the existence of disclosure rather than its quality and comprehensiveness. Third, the study is limited to transportation and logistics companies listed on the Indonesia Stock Exchange during 2022–2024, which may restrict the generalizability of the findings. Finally, although the dataset consists of firm-year observations, the study employs pooled regression analysis and does not fully account for firm-specific and time-specific effects. Future studies are encouraged to apply panel-data techniques and incorporate additional determinants of carbon emission disclosure.

In addition, the explanatory power of the model indicates that carbon emission disclosure is influenced by factors beyond those examined in this study. Future research is therefore encouraged to incorporate additional determinants such as ownership structure, media exposure, carbon intensity, ESG pressures, and regulatory factors. Future studies may also employ alternative measures of environmental performance and expand the sample across industries and longer observation periods to provide a more comprehensive understanding of corporate carbon disclosure practices.

References

- Alfayerds, W., & Setiawan, M. A. (2021). Pengaruh Pengungkapan Emisi Karbon dan Annual Report Readability terhadap Nilai Perusahaan (Studi Empiris pada Perusahaan Peringkat

- PROPER yang Terdaftar di BEI Tahun 2016-2018). *Jurnal Eksplorasi Akuntansi* 3(2). <http://ejournal.unp.ac.id/students/index.php/jea>
- Ali, W., Frynas, J. G. dan Mahmood, Z. (2024). Corporate governance mechanisms and carbon disclosure: A multilevel and international analysis. *Corporate Social Responsibility and Environmental Management*, 31(1), 95–110. <https://doi.org/10.1002/csr.2869>
- Amaliyah, I., & Solikhah, B. (2019). Pengaruh Kinerja Lingkungan dan Karakteristik Corporate Governance Terhadap Pengungkapan Emisi Karbon. *Journal of Economic, Management, Accounting and Technology*, 2(2), 129–141. <https://doi.org/10.32500/jematech.v2i2.720>
- Ardillah, K., dan Rusli, Y. M. (2022). The effect of corporate governance structures, environmental performance, and media coverages to carbon emissions disclosure. *ULTIMA Accounting*, 14(2), 246–263.
- Arsy, C. B., & Amin, M. N. (2025). Pengaruh Ukuran Perusahaan, Profitabilitas dan Kinerja Lingkungan terhadap Pengungkapan Emisi Karbon. *Ekonomis: Journal of Economics and Business*, 9(1), 86-91. <https://doi.org/10.33087/ekonomis.v9i1.2033>
- Choi, B. B., Lee, D., dan Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. *Pacific Accounting Review*, 25(1), 58–79. <https://doi.org/10.1108/01140581311318968>
- Desiana, D., Luthfia Nanda, U., & Hermansyah, I. (2025). Determinan Pengungkapan Emisi Karbon: Sebuah Studi di Sektor Energi. *Owner*, 9(2). <https://doi.org/10.33395/owner.v9i2.2493>
- Dhamayanti, Y., & Restuningdiah, N. (2022). Content Analysis: Sustainability Report At Pt Unilever Indonesia Tbk. *International Journal Of Humanities Education And Social Sciences (IJHESS)*, 2(1), 2808–1765. <https://ijhess.com/index.php/ijhess/>
- Efendy, D. G., Ulum, I., dan Widyastuti, A. (2023). The effect of company profitability, leverage, and size on carbon emission disclosure with environmental performance as a moderating variable (empirical study on manufacturing companies listed on the stock exchange in 2020). *Environmental Issues and Social Inclusion in a Sustainable Era*, 347–356. <https://doi.org/10.1201/9781003360483-40>
- Firmansyah, A., Jadi, P.H., Febrian, W. dan Sismanyudi, D. (2021). Pengaruh Tata Kelola Perusahaan Dan Ukuran Perusahaan Terhadap Pengungkapan Emisi Karbon Di Indonesia. *Jurnal Informasi, Perpajakan, Akuntansi, dan Keuangan Publik*, 16(2), 303–320. <http://dx.doi.org/10.25105/jipak.v16i2.9420>
- Guang-Wen, Z., & Siddik, A. B. (2022). Do Corporate Social Responsibility Practices and Green Finance Dimensions Determine Environmental Performance? An Empirical Study on Bangladeshi Banking Institutions. *Frontiers in Environmental Science*, 10. <https://doi.org/10.3389/fenvs.2022.890096>
- IESR. (2025, Juli 14). Mewujudkan Strategi Transportasi Rendah Emisi Dan Berkelanjutan Untuk Indonesia Maju 2045. *Institute for Essential Services Reform*. <https://iesr.or.id/mewujudkan-strategi-transportasi-rendah-emisi-dan-berkelanjutan-untuk-indonesia-maju-2045/>
- Kompas.com. (2025, May 31). Studi WRI: Truk dan Bus Berkontribusi 35,6% Emisi Karbon. Kompas.Com. <https://otomotif.kompas.com/read/2025/05/31/074200615/studi-wri--truk-dan-bus-berkontribusi-35-6-emisi-karbon>
- Kusumajaya, I. M. D. dan Budiasih, I. G. A. N. (2025). Corporate governance, green investment, and carbon emission disclosure moderated by environmental reputation. *E-Jurnal Akuntansi*, 35(7), 1891–1905. <https://doi.org/10.24843/EJA.2025.v35.i07.p01>

- Kusumaningtyas, A. N. (2024). “Upaya mitigasi emisi karbon: seberapa seriuskah indonesia?” Prosiding Seminar Sosial Politik, Bisnis, Akuntansi dan Teknik (SoBAT). hal. 28–40.
- Luo, W., Guo, X., Zhong, S., dan Wang, J. (2019). Environmental Information Disclosure Quality, Media Attention And Debt Financing Costs: Evidence From Chinese Heavy Polluting Listed Companies. *Journal of Cleaner Production*, 231, 268–277. <https://doi.org/10.1016/j.jclepro.2019.05.237>
- Mawarti, D. A. dan Murwaningsari, E. (2024). Faktor Yang Mempengaruhi Pengungkapan Emisi Karbon. *Jurnal Ekonomi Trisakti*, 4(2), 165–174. <https://dx.doi.org/10.25105/jet.v4i12.20226>
- Medcom.id. (2024, November 14). Indonesia Butuh Panduan Mitigasi Emisi Karbon. Medcom.Id. <https://www.medcom.id/otomotif/mobil/dN632yvb-indonesia-butuh-panduan-mitigasi-emisi-karbon>
- Mujiani, S., Fauziah, F., dan Juardi (2019). Determinan carbon emission disclosure pada perusahaan bumn yang terdaftar di bursa efek indonesia periode 2013-2017. *JIAFE (Jurnal Ilmiah Akuntansi Fakultas Ekonomi)*, 5(1), 53–64. <https://journal.unpak.ac.id/index.php/jiafe>
- Pranasyahputra, R. H., Elen, T., dan Dewi, K. S. (2020). Pengaruh leverage, kompetisi, dan pertumbuhan perusahaan terhadap carbon emission disclosure (studi empiris pada perusahaan manufaktur yang terdaftar di bei tahun periode 2015 – 2017). *Jurnal Akuntansi Trisakti*, 7(1), 75–88. <https://doi.org/10.25105/jat.v7i1.6168>
- Primalia, M. H. P., dan Prasetyo, J. E. (2025). The Effect Of Corporate Governance, Profitability, And Working Capital On Carbon Emission Disclosure In Energy Sector Companies. *Dinasti International Journal of Economics, Finance & Accounting (DIJEFA)*, 5(6), 5589–5601. <https://doi.org/10.38035/dijefa.v5i6>
- Putri, A., dan Trisnawati, R. (2023). The impact of company size, profitability, industry type, leverage, and environmental performance on carbon emission disclosure. *National Conference on Applied Business, Education, & Technology (NCABET)*, 3(1), 17–32. <https://doi.org/10.46306/ncabet.v3i1>
- Rahmawaty, L. A., dan Harahap, C. D. (2024). Pengaruh Klasifikasi Industri, Kinerja Karbon Dan Kinerja Lingkungan Terhadap Pengungkapan Emisi Karbon Pada Perusahaan Sektor Manufaktur Di Indonesia. *Jurnal Ekonomi Trisakti*, 4(2), 1005–1014. <https://doi.org/10.25105/jet.v4i2.20973>
- Setiawan, I., Gunawan, A., dan Djunaidy, D. (2022). Analisis Pengungkapan Emisi Gas Karbon Ditinjau Dari Profitabilitas, Ukuran Perusahaan Dan Proporsi Komisaris Independent. *Jurnal Bisnis, Logistik Dan Supply Chain (BLOGCHAIN)*, 2(1), 9–16. <https://doi.org/10.55122/blogchain.v2i1.401>
- Subroto, V. K., dan Endaryati, E. (2024). Kumpulan teori akuntansi. Yayasan Prima Agus Teknik.
- Suhardi, M. K (2025). Pengaruh kinerja lingkungan, ukuran perusahaan, leverage dan sales growth terhadap pengungkapan emisi karbon. *AKADEMIK: Jurnal Mahasiswa Ekonomi & Bisnis*, 5(2), 786–798.
- Suherman, Y., dan Kurniawati, K. (2023). Pengaruh profitabilitas, environmental management system, kepemilikan institusional dan komite audit terhadap carbon emissions disclosure. *Jurnal Aplikasi Akuntansi*, 8(1), 142–156. <https://doi.org/10.29303/jaa.v8i1.289>
- Wirawan, J., dan Setijaningsih, H. T. (2022). Analisis pengungkapan emisi karbon di indonesia. *Jurnal Muara Ilmu Ekonomi disian Bisnis*, 6(1), 235–249. <https://doi.org/10.24912/jmieb.v6i1.18398>

Vergiawan, et al

Environmental Performance, Corporate Governance, and Carbon Emission Disclosure: Evidence from Indonesian Transportation and Logistics Companies



© 20XX by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC-BY-NC-ND 4.0) license (<http://creativecommons.org/licenses/by/4.0/>).