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Profitability's Ability to Moderate the Effect of Carbon Emission Disclosure and Environmental Performance on Firm Value

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ABSTRACT: This study aims to examine the effect of carbon emission disclosure (CED) and environmental performance on firm value, with profitability acting as a moderating variable. The research was conducted on energy sector companies listed on the Indonesia Stock Exchange (IDX) during the period 2019–2023. A quantitative approach using descriptive-causal analysis was applied. The study used secondary panel data obtained from financial and sustainability reports. Thirteen energy companies were selected through purposive sampling. Data were analyzed using panel data regression and moderated regression analysis (MRA). The results show that CED does not significantly affect firm value, while environmental performance has a positive impact. Profitability does not moderate the relationship between CED and firm value but does strengthen the influence of environmental performance on firm value. These findings highlight the importance of environmental initiatives combined with strong financial performance in enhancing firm value. For corporate managers and policymakers, this underscores the need to integrate sustainability practices into strategic decision-making to improve long-term firm valuation.

Keywords: Carbon Emissions Disclosure, Environmental Performance, Return on Assets, Tobin's Q, Energy Sector.

INTRODUCTION

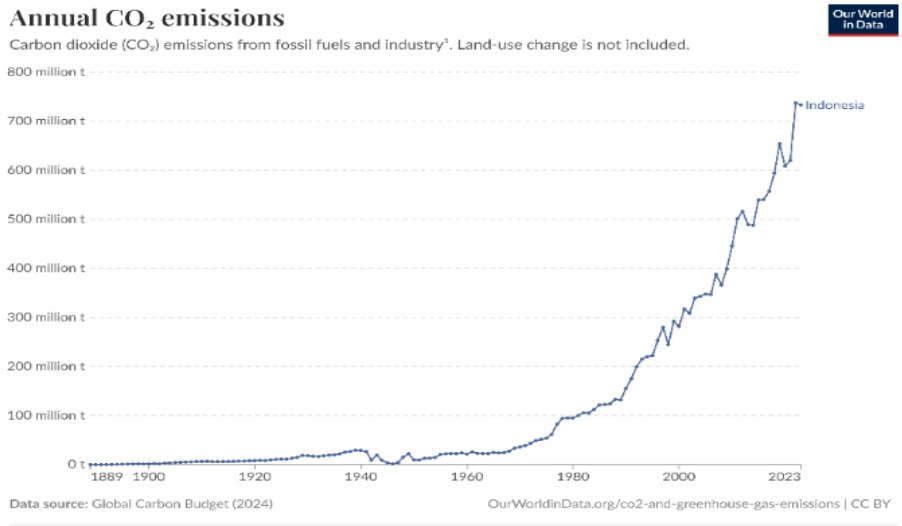
Global warming, defined as the continuous rise in average global temperatures, has led to severe climate change and the depletion of non-renewable energy resources (Paramita & Ali, 2023). One of its primary causes is the greenhouse gas (GHG) effect, in which heat from the sun is trapped in the Earth's atmosphere due to the accumulation of harmful gases such as carbon dioxide, methane, and nitrous oxide (Mustikaningrum et al., 2021). This environmental crisis is largely driven by human activities—such as fossil fuel consumption, industrial processes, and

transportation—with the energy sector recognized as one of the largest contributors to GHG emissions (Marini & Vinola Herawaty, 2024).

The Global Carbon Project report noted global anthropogenic carbon dioxide emissions attained a historical maximum of 37 billion tons in 2019 mainly due to increased demand for oil and natural gas, two major commodities in the energy industry (CNN INDONESIA, 2019). According to Climate Watch by 2023, the power generation sector is responsible for nearly half of the Asia Pacific region's major carbon dioxide emissions, with the transportation and industrial sectors coming in second and third (Bahriansyah & Ginting, 2022). According to information from Indonesia's Ministry of Energy and Mineral Resources in 2019, the energy sector contributed 46.35% of total emissions, followed by transportation at 26.39%, manufacturing at 17.75%, and other sectors at 9.51% (Kementerian Energi Dan Sumber Daya Mineral, 2019).

According to data from Our World in Data, Indonesia has experienced a significant increase in per capita carbon emissions over the last century, with an estimated rise of more than 1,100% between 1920 and 2020. This sharp escalation places Indonesia among the highest emitters in the Asia-Pacific region. The following image shows the trend.

Figure 1. Indonesia's Per Capita Carbon Emissions in the Last 100 Years



Source: Our World in Data

It can be seen that in the last century, from 1920 to 2020, Indonesia's CO2 emissions per capita increased significantly by 1,133.66 percent. 2019 saw the largest increase at 1,297.25 percent. This increase is due to the increased use of coal, gas and fossil fuels (Ritchie & Roser, 2020).

Countries like Indonesia are encouraged by the suited of International climate treaties, encompassing the Paris Agreement and Kyoto Protocol, established to achieve reductions in carbon emissions and promote sustainable business practices (Marini & Vinola Herawaty, 2024).

As a follow-up to this commitment, POJK No. 51/POJK.03/2017 issued by the Indonesian government, mandates that issuers, public businesses, and financial sector institutions prepare sustainability reports. After a two-year transition period, starting in 2019, financial services institutions are required to submit reports or RAKB, while other sectors and public companies are required to report annually starting in 2020 (Xaviera & Rahman, 2023). The publication of sustainability reports covering environmental performance and corporate sustainability strategies is an embodiment of the company's support and contribution to climate change mitigation and the achievement of sustainable development goals.

With the issue of sustainability, companies are required to continuously adapt to the latest developments amid increasingly competitive global dynamics (S. N. Gunawan et al., 2021). Companies that are able to reflect superior values will gain a positive perception from the public and consumers. Therefore, corporate values have become a crucial aspect (Pratama et al., 2024). The primary objective of business is to optimize profits and increase Firm value. One factor that affects this value is environmental issues, which are now an important consideration for investors even though they are not directly related to company operations.

Firm value reflects the level of trust that investors or the public have in the company, related to its performance and positive prospects in managing its resources (Nashrulloh & Achyani, 2024). Environmental factors such as carbon disclosure and environmental performance can have an impact on firm value. However, the company's ability to monetize is also expected to increase the impact of environmental factors on firm value.

Previous studies examining the impact of carbon emission disclosure and environmental performance on firm value have yielded inconsistent results, with some indicating a significant influence while others report no measurable effect.. A study conducted by (Rahmianingsih & Malau, 2022), (Yuliandhari et al., 2023), (Damas et al., 2021), (Putri & Paramita, 2025), and Zulkifli (2025) states that firm value is positively effected by disclosure of emissions data. Conversely, studies carried out by (Asyifa & Burhany, 2022), (Gunawan & Berliyanda, 2024), (Fanda & Dwijayanti, S, 2024), (Nashrulloh & Achyani, 2024), and Marini & Herawaty (2024) states the relationship between carbon emission disclosure and firm value is non-existent.

Furthermore, several research efforts, like those performed by (Pratama et al., 2024), (Komara et al., 2024), and (Asyifa & Burhany, 2022), indicate that environmental performance yields positive outcomes for firm value. However, different results were found by (Goldie Kelly & Deliza Henny, 2023), who stated that there was no significant effect.

In terms of moderating profitability, (Zulkifli., 2025) found that profitability can moderate the consequence of carbon emission transparency on firm value contrary to the findings of (Marini & Vinola Herawaty, 2024), who stated the opposite. Meanwhile, (Goldie Kelly & Deliza Henny, 2023) assert that how enviromental performance affect firm value is able to contingent upon profitability, though differing findings were reported by (Mia Fitriani & Puji Endah Purnamasari, 2023).

Legitimacy Theory

According to legitimacy paradigm, initially formulated by Pfeffer and Dowling in 1975, companies always try to comply with norms that are considered acceptable by society. This theory forms the basis for shaping the relationship between companies and the community, in which companies utilize resources from the surrounding environment and contribute in return to the community (Asyifa & Burhany, 2022); (Goldie Kelly & Deliza Henny, 2023); (Rahelliamelinda & Handoko, 2024). According to legitimacy theory, companies are expected to act in accordance with social norms and expectations in order to gain approval and recognition from their stakeholders (Paramita & Ali, 2023).

Signaling Theory

Spence first proposed the idea of signaling in 1973. According to this, parties that have information, in this case companies, send out certain signals or indicators that represent the true state of the company. The information provided is intended to give an overview to the recipients, such as investors, so that they can make more informed decisions based on these signals (Pratama et al., 2024); (Wisnu Pratama & Marsono, 2021). However, effective communication of information is not only important for investors but also serves as a strategic tool in establishing relationships with various stakeholders.

Stakeholder Theory

Freeman first introduced stakeholder theory in 1998. Freeman defines a stakeholder as "any group or individual that can affect or be affected by the achievement of a company's objectives". Therefore, companies act in the best interests of a number of interrelated parties, including shareholders, creditors, customers, suppliers, governments, communities, analysts and others, in addition to their own interests. Companies should seek to meet the needs of these stakeholders, as their support is critical to the survival of the company (Damas et al., 2021); (Marini & Vinola Herawaty, 2024).

Firm Value

A reflection/representation of investors' and the market's perception of its overall performance and condition (Bahriansyah & Lestari Ginting, 2022); (Rahelliamelinda & Handoko, 2024). The quality of a company's financial performance determines how much it is worth (Dewi & Sembiring, 2022). Firm value is often associated with the selling price of the company, which includes total assets, liabilities, and equity as recorded in the annual financial statements (Yuliandhari et al., 2023). Tobin's Q is used in this study to estimate firm value. Referring to the research conducted by Marini & Herawaty (2024), firm value is formulated as follows :

$$\text{Tobin's Q} = \frac{MVE + Total\ Debt}{Total\ Assets}$$

Carbon Emission Disclosure

Carbon emissions are defined as the atmospheric discharge of carbon, predominantly in its carbon dioxide (CO_2), molecular form, into the atmosphere, usually caused by the combustion of carbon-

containing materials, such as coal, natural gas, oil, diesel, and other fossil fuels, due to human and industrial activities (Kristina, 2021); (Zanra et al., 2020). Carbon emission disclosure involves making publiic the details of information by companies regarding their contribution to, management of, and efforts to reduce carbon emissions, presented in sustainability reports or annual reports (Ramdani & Nugraha, 2022); (Rusmana & Purnaman, 2020); (Yuliandhari et al., 2023).

The carbon emissions reporting metric seen in sustainability or annual reports provides information on carbon emissions disclosure. (Bae Choi et al., 2013) created this index, which is divided into five categories pertaining to carbon emissions and climate change: energy consumption, greenhouse gas emissions, climate change (risks and possibilities), greenhouse gas emission control, along with its economic burden and mechanisms for oversight. There are eighteen things on the checklist that must be identified in the carbon emissions disclosure area. According to Choi et al. (2013), each declared item receives a score of 1, while any unreported things receive a score of 0. According to (Meiryani et al., 2023), the carbon emissions disclosure is measured as follows :

$$\text{CED} = \frac{\sum Di}{M}$$

Description:

CED = Carbon Emission Disclosure

∑Di = Number of items disclosed

M = Total number of disclosure items (18)

Environmental Performance

This is an evaluation of the extent to which a company is responsible for managing the environmental impacts associated with its operational activities (Komara et al., 2024); (Mia Fitriani & Puji Endah Purnamasari, 2023); (Pratama et al., 2024). In this study, the company's ranking in the PROPER of the Ministry of Environment and Forestry is used as a benchmark for environmental performance.

Table 1. PROPER Ranking

Color	Score
Gold	5
Green	4
Blue	3
Red	2
Black	1

Source: (Pratama et al., 2024)

Given that environmental performance data measured using PROPER is ordinal in scale, while regression analysis requires interval data, data transformation was performed using MSI or the Method of Successive Intervals. The MSI method converts ordinal data into interval data by converting the cumulative proportion of each categorical variable into the corresponding value on a standard normal distribution curve. (Ningsih & Dukalang, 2019).

Profitability

Profitability refers to its apptitude for realizing net income over a defined timeframe using its total assets and working capital. (Iman et al., 2023); (Zulkifli., 2025). The profitability ratio is employed to ascertain the company's aptitude for realizing net income. Higher profitability indicates better management performance in terms of allocating company resources appropriately and efficiently. (Jaya et al., 2023); (Sutrisno, 2017). A company's core aim is to earn and maximize profit, which can be utilized to support operations, build value, and maintain business continuity (Wulandari & Paramita, 2016). The challenge of additional costs will be easier to overcome for businesses that can optimize the use of their assets (Rohiman & Ramli, 2025).

In this study, profitability is assessed based on the rate of return on assets (ROA). According to Sutrisno (2017:213), ROA, known as economic profitability, used to assess the firm's capacity for profit generation relative to its total asset base. The formula for Return on Assets (ROA) is as follows :

$$\text{ROA} = \frac{Earning\ Before\ Interest\ Tax}{Total\ Assets}$$

The Effect of Carbon Emission Disclosure on Firm Value

Companies actively disclose carbon emissions information aim to improve their public image and achieve social legitimacy by demonstrating their commitment to social and environmental responsibility. Through such disclosure, companies demonstrate their commitment to sustainability principles and awareness of their environmental impact. Such initiatives enhance the public and investors' perception of the firm's standing, and promote a favorable view of its credibility and long-term business viability. This good reputation can increase investor interest in the company's shares, improve its competitiveness in the market and ultimately foster an enhancement in the company's comprehensive valuation (Fanda & Dwijayanti, S, 2024); (Marini & Vinola Herawaty, 2024). Therefore, it is know that the hypothesis is:
Ha : Carbon Emission Disclosure Has a Positive Effect on Firm Value

The Effect of Environmental Performance on Firm Value

A signaling theory described companies with a good environmental performance demonstration, send positive signals that help build a good reputation of public and investors. This, in turn, attracts investors who provide capital so that the company has more financial resources to support its operations and growth. As a result, good environmental performance can directly strengthen firm value (Goldie Kelly & Deliza Henny, 2023); (Mardiana & Wuryani, 2019). Therefore, the hypothesis found is:
Ha : Environmental Performance Has a Positive Effect on Firm Value.

Profitability Can Moderate Carbon Emission Disclosure on Firm Value

Carbon emission disclosure through company reports can build a positive image and increase firm value, although the impact is not always uniform. Profitability acts as a factor that strengthens or weakens this relationship. Companies with high profits can invest their profits in sustainable practices and carbon emission reduction, so investors may value companies that disclose carbon emissions more highly because the companies demonstrate a long-term commitment to sustainability. A high level of investor participation in a company indicates a high market value on the stock exchange (Marini & Vinola Herawaty, 2024); (Zulkifli., 2025). Therefore, our hypothesis is:

Ha : Profitability Can Moderate Carbon Emission Disclosure on Firm Value

Profitability Can Moderate Environmental Performance on Firm Value

Environmental performance requires additional expenses beyond the company's main operating costs, such as environmental management and conservation activities. These expenses can reduce the funds available for operational activities. However, companies with high profitability have sufficient financial capacity to cover these costs. Therefore, the legitimacy obtained by companies through efforts to maintain positive enviromental performance can be associated with higher firm value, markedly if supported by high profitability (Goldie Kelly & Deliza Henny, 2023); (Prasetio & Prijanto, 2024). Highly profitable companies are able to invest in environmental initiatives without disrupting their finances, thereby building investor confidence, strengthening their reputation, and raising the value and competitiveness of the company in a sustainable manner. Therefore, the hypothesis known as:

Ha : Profitability Can Moderate Environmental Performance on Firm Value

METHOD

This study uses a quantitative approach with a descriptive-causal research design, aiming to analyze the causal relationship between carbon emissions disclosure, environmental performance, and company value, with profitability as a moderating variable.

The research population includes all energy sector companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. A total of 13 companies were selected using purposive sampling, with the following criteria:

a. Energy sector companies with equity trading on the IDX between 2019 and 2023.
b. Companies that received a PROPER rating for the 2019-2023 period.
c. Companies that published annual reports for the 2019-2023 period.
d. Companies with exhaustive data for the variables under investigation.

This study uses secondary data, compiled from annual reports, financial reports, and sustainability reports. Data analysis was conducted using panel data regression, which accommodates cross-sectional and time-series dimensions. This method allows for better control of heterogeneity

between companies. In addition, Moderate Regression Analysis (MRA) was applied to test the interaction between profitability and independent variables. All statistical analyses were performed using views 13 software.

RESULT AND DISCUSSION

Descriptive Statistics

Our analysis employs carbon emission disclosure and enviromental performance as explanatory variables for firm value, considering profitability as a conditioning variable. Researchers first conducted a descriptive statistical analysis, as shown in the table below, before starting the analysis.

Table 2. Descriptive Statistics

Variabel	N	Min	Max	Average	Std. Dev
Carbon Emission Disclosure	65	0.06	1.00	0.63	0.25
Environmental Performance	65	3.00	5.00	3.80	0.73
Firm Value	65	0.54	3.11	1.14	0.45
Profitability	65	-3.51	61.76	14.24	15.32

Source: Data processed using E-Views 13

Before conducting hypothesis testing, descriptive statistics were used to understand the distribution of each variable (see Table 2). The average score of carbon emission disclosure was 0.63 with a standard deviation of 0.25, indicating a moderate and relatively consistent level of disclosure among firms. Environmental performance had an average score of 3.80 on a scale of 1–5, suggesting most companies performed well environmentally. Firm value, measured by Tobin's Q, had an average of 1.14, indicating that firms generally created market value above their book value. Profitability, measured by ROA, had high variation with a mean of 14.24 and a standard deviation of 15.32.

Model Selection

The results of the model selection test are presented as follows:

Table 3. Chow Test Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	7.341648	(12,50)	0.0001
Cross-section Chi-square	66.036976	12	0.0000

Source: Data processed using E-Views 13

Based on the table 3 (Chow test results), the probability value is 0.0001 or < 0.05, so Ha is accepted, and the appropriate model is the Fixed Effect Model (FEM).

Table 4. Hausman Test Result

Effects Test	Chi-Sq Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.444450	2	0.2946

Source: Data processed using E-Views 13

Based on the table 4 (Chow test results), the probability value is 0.2946 or > 0.05, so Ha is rejected, and the appropriate model is the Random Effect Model (REM).

Table 5. Lagrange Multiplier Test Result

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	17.04255 (0.0000)	1.026326 (0.3110)	18.06888 (0.0000)

Source: Data processed using E-Views 13

Based on the LM test results (table 5), the probability value is 0.0000 or < 0.05, so Ha is accepted, and the appropriate model is the Random Effect Model (REM). Considering the Chow test, Hausman test, and LM test results, it can be concluded that the best model to use in this study is the Random Effect Model (REM).

Classic Assumption Test

According to Ghozali (2021), in the Random Effect Model approach estimated using Generalized Least Squares (GLS), the data have been considered to meet the BLUE (Best Linear Unbiased Estimator) assumption so that classic assumption tests such as normality, heteroscedasticity, multicollinearity, and autocorrelation are not required.

Panel Data Regression Analysis

Table 6. Panel Data Regression Analysis Results

Variable	*Coefficient*	*Sig.Probability*
C	1.142589	0.0003
X1_CED	-0.009275	0.9656
X2_Environmental Performance	0.298127	0.0012

Source: Data processed using E-Views 13

The table provides the basis for the following regression analysis model equation:

$$NP = 1.142589 - 0.009275CED + 0.298127EP + e$$

The constant value of 1.1426 suggests the baseline firm value when both independent variables are zero. Carbon emission disclosure (CED) has a negative coefficient (−0.0093) with a p-value of 0.9656, indicating no statistically significant effect on firm value. It is important to note that this coefficient does not represent a percentage change, as the CED variable is an index, not in percent units. Environmental performance (EP), on the other hand, shows a positive and significant effect, with a coefficient of 0.2981 and a p-value of 0.0012, meaning that an increase in EP is associated with a higher firm value.

Moderated Regression Analysis (MRA)

Table 7. Moderated Regression Analysis (MRA) Results

Variable	*Coefficient*	*Sig.Probability*
C	0.839034	0.0010
X1*Z_CED*Profitability	0.007307	0.5905
X2*Z_ Environmental Performance *Profitability	0.013408	0.0085

Source: Data processed using E-Views 13

Based on table 7, the regression analysis model equation, derived from Table 7, is:

NP = 0,839034+ 0,007307CED*P + 0,013408EP*P + e

The coefficient for CED × Profitability (0.0073) is not statistically significant (P Value = 0.5905), implying that profitability does not moderate the relationship between carbon emission disclosure and firm value. Meanwhile, the coefficient for EP × Profitability (0.0134) is significant (P value = 0.0085), indicating that profitability strengthens the positive relationship between environmental performance and firm value.

Hypothesis Testing
T-test (Partial)

Table 8. T-test results (partial)

Variable	*Coefficient*	*Sig.Probability*	Conclusion
CED	-0.009275	0.9656	Ha rejected
Environmental Performance (EP)	0.298127	0.0012	Ha accepted
CED_ Profitability	0.007307	0.5905	Ha rejected
EP_ Profitability	0.013408	0.0085	Ha accepted

Source: Data processed using E-Views 13

The results of the t-test examining the effect of independent variables and interaction variables on the dependent variable are as follows:

1. The CED variable (X1) has a p-value of 0.9656 (> 0.05), so Ha is rejected, indicating that CED has no significant effect on firm value.
2. The environmental performance variable (X2) has a p-value of 0.0012 (< 0.05), so Ha is accepted. The positive coefficient of 0.298127 indicates a value-enhancing outcome of environmental performance.
3. The interaction between CED × profitability has a p-value of 0.5905 (> 0.05), so Ha is rejected. Profitability does not act as an effect modifier in the relationship between carbon emission disclosure and firm value
4. The interaction between environmental performance and profitability shows a p-value of 0.0085 (< 0.05), so Ha is accepted. The positive coefficient of 0.013408 indicates that profitability is able to moderate (strengthen) the effect of environmental performance on firm value.

F Test (Simultaneous)

Table 9. F Test Result

F-statistic	9.384751
Prob(F-statistic)	0.000008

Source: Data processed using E-Views 13

The F-test results presented in Table 9 show a probability value (F-statistic) of 0.000008, which is less than the 0.05 significance level. Thus, the alternative hypothesis (Ha) is supported, indicating that carbon emission disclosure (X1) and enviromental performance (X2) collectively have a significant impact on firm value (Y).

Determination Coefficient Test

Table 10. Determination Coefficient Test Results

R-squared	0.417256
Adjusted R-squared	0.371482

Source: Data processed using E-Views 13

Based on Table 10, the adjusted R-squared value was recorded at 0.371482. This shows that the dependent variable, namely firm value, can be explained by 37.1482% by the independent variables of carbon emission disclosure and environmental performance, as well as profitability as a moderating variable. Meanwhile, the remaining 62.8518% is explained by other factors not included in this model.

The Effect of Carbon Emission Disclosure (CED) on Firm Value

The panel regression results indicate that carbon emission disclosure (CED) has no significant effect on firm value, with a coefficient of −0.0093 and a p-value of 0.9656. This finding suggests that carbon transparency, as measured by disclosure indices, does not translate into enhanced firm value in the Indonesian energy sector. One possible explanation is the relatively low level of investor awareness and limited integration of environmental disclosures into financial decision-making in Indonesia. Additionally, although regulations such as POJK No. 51/POJK.03/2017 require sustainability reporting, enforcement remains weak, and disclosures tend to be inconsistent and non-comparable across companies. This reduces their credibility and relevance for market valuation.

The insignificant relationship found in this study is consistent with previous research by Gunawan & Berliyanda (2024), Fanda & Dwijayanti (2024), and Marini & Herawaty (2024), all of which found no effect of CED on firm value. However, it contradicts findings by Rahmianingsih & Malau (2022) and Damas et al. (2021), who reported positive and significant impacts, possibly due to differences in sample scope, industry focus, or investor profiles.

The Effect of Environmental Performance on Firm Value

Based on the test results, environmental performance shows a positive impact, as indicated by a p-value of 0.0012 (< 0.05) and a coefficient of 0.298127. This means that firm value increases along with the level of environmental performance. These results are consistent with other studies, including research conducted by (Asyifa & Burhany, 2022), (Komara et al., 2024), and Pratama et al. (2024), which show that environmental performance has a positive effect on firm value. Environmental performance carried out by companies as a form of compliance with existing norms or regulations makes the public perceive the company positively, so that companies with good environmental performance will increase public trust to purchase items or invest capital, thereby increasing firm value (B. Gunawan & Berliyanda, 2024).

Profitability Can Moderate *Carbon Emission Disclosure* on Firm Value

The test results show that profitability does not moderate the relationship between carbon disclosure and firm value, as indicated by the interaction variable p-value of 0.5905, which exceeds the 0.05 significance level. This suggests that level of corporate profitability neither increases nor decreases the carbon disclosure impact on firm value. Our findings are consistent with the body of prior research, such as research conducted by (Marini & Vinola Herawaty, 2024), which states

that profitability cannot moderate carbon emission disclosure on firm value. Investors have not fully considered profitability in assessing carbon emission disclosure. Even though companies have strong finances, inconsistent disclosure quality and varying reporting standards make this information less effective as a market signal. Low investor awareness of carbon emission issues in Indonesia and weak regulations also cause profitability has no potential to strengthen the effect of carbon emission disclosure on firm value.

Profitability Can Moderate Environmental Performance on Firm Value

This observation shows that profitability moderates the effect of environmental performance on firm value, as indicated by the interaction variable p-value of 0.0085 - below the 0.05 significance level - and a positive coefficient of 0.000823. Statistically, this means that profitability strengthens the relationship between environmental performance and firm value. These results corroborate previous studies„ such as that conducted by (Goldie Kelly & Deliza Henny, 2023), which stated that profitability has the capacity to moderate environmental performance on firm value. This shows that in emerging markets such as Indonesia, investors value environmental efforts made by companies with strong financial performance. Profitable companies are considered more capable of implementing sustainability strategies consistently and sending positive signals about their long-term prospects, thereby strengthening the effect of environmental performance on firm value.

CONCLUSION

This study examined the influence of carbon emission disclosure and environmental performance on firm value, with profitability as a moderating variable, using panel data from 13 energy sector companies listed on the Indonesia Stock Exchange between 2019 and 2023. The findings demonstrate that while carbon emission disclosure does not significantly affect firm value, environmental performance has a positive and significant impact. Moreover, profitability strengthens the relationship between environmental performance and firm value but does not moderate the effect of carbon disclosure.

Theoretically, these findings contribute to the growing body of literature on environmental, social, and governance (ESG) factors by emphasizing that actual environmental outcomes, rather than voluntary disclosure, play a more critical role in enhancing firm value, particularly in emerging markets. The study also underscores the moderating role of financial capacity in converting environmental performance into tangible firm value.

From a managerial perspective, companies especially in high-emission industries like energy should prioritize improving measurable environmental performance, such as those captured in national programs like PROPER. Furthermore, firms with strong profitability are better positioned to integrate environmental initiatives into their business strategy, which can enhance both reputation and valuation. Investors and stakeholders are more responsive to concrete sustainability actions than to symbolic reporting.

For policymakers, the results highlight the importance of standardizing and strengthening disclosure regulations, ensuring that carbon-related reporting is consistent, comparable, and audited. Enhanced regulatory frameworks and stakeholder education may improve the market relevance of carbon transparency in the future.

However, this study is not without limitations. The analysis is restricted to a single industry (energy), with a relatively small sample size and timeframe (65 firm-year observations from 2019–2023). In addition, this study did not apply robustness checks or alternative proxies for firm value and profitability. These limitations open opportunities for future research to explore cross-industry comparisons, longer periods, and expanded variable models to test the generalizability and robustness of these findings.

REFERENCE

Asyifa, D. A., & Burhany, D. I. (2022). Carbon Emission Disclosure and Environmental Performance Effect on Firm Value. *International Journal of Arts and Social Science*, *5*(7), 193–203.

Bae Choi, B., Lee, D., & Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. *Pacific Accounting Review*, *25*(1), 58–79. https://doi.org/10.1108/01140581311318968

Bahriansyah, R. I., & Lestari Ginting, Y. (2022). Pengungkapan Emisi Karbon Terhadap Nilai Perusahan dengan Media Exposure Sebagai Variabel Moderasi. *Jurnal Riset Akuntansi & Perpajakan (JRAP)*, *9*(02), 249–260. https://doi.org/10.35838/jrap.2022.009.02.21

CNN INDONESIA. (2019). *Emisi Karbon Dioksida Global Capai Rekor Tertinggi Tahun 2019*. CNN INDONESIA. https://www.cnnindonesia.com/teknologi/20191205191747-199-454565/emisi-karbon-dioksida-global-capai-rekor-tertinggi-tahun-2019

Damas, D., Maghviroh, R. El, & Meidiyah, M. (2021). PENGARUH ECO-EFFICIENCY, GREEN INOVATION DAN CARBON EMISSION DISCLOSURE TERHADAP NILAI PERUSAHAAN DENGAN KINERJA LINGKUNGAN SEBAGAI MODERASI. *Jurnal Magister Akuntansi Trisakti*, *8*(2), 85–108. https://doi.org/10.25105/jmat.v8i2.9742

Dewi, F. M., & Sembiring, F. M. (2022). Pengaruh Debt to Equity Ratio, Return on Assets, Return on Equity, dan Ukuran Perusahaan terhadap Nilai Perusahaan pada. *Portofolio: Jurnal Ekonomi, Bisnis, Manajemen Dan Akuntansi*, *19 (1)*(1), 1–19.

Fanda, V., & Dwijayanti, S, P. F. (2024). PENGARUH PENGUNGKAPAN EMISI KARBON, ECO- EFFIENCY, DAN GREEN INNOVATION TERHADAP NILAI PERUSAHAAN. *Jurnal Ilmiah Mahasiswa Akuntansi*, *13*(1), 60–73. https://doi.org/10.33508/jima.v13i1.5727

Goldie Kelly, S., & Deliza Henny. (2023). PENGARUH GREEN ACCOUNTING DAN KINERJA LINGKUNGAN TERHADAP NILAI PERUSAHAAN DENGAN

PROFITABILITAS SEBAGAI VARIABEL MODERASI. *Jurnal Ekonomi Trisakti*, *3*(2), 3301–3310. https://doi.org/10.25105/jet.v3i2.18051

Gunawan, B., & Berliyanda, L. (2024). *Pengaruh Green Accounting , Pengungkapan Emisi Karbon , dan Kinerja Lingkungan Terhadap Nilai Perusahaan*. *8*(1). https://doi.org/10.18196/rabin.v8i1.22027

Gunawan, S. N., Sembiring, F. M., & Paramita, V. S. (2021). *THE EFFECT OF GREEN INVESTMENT, CORPORATE SOCIAL RESPONSIBILITY, AND GOOD CORPORATE GOVERNANCE ON GREEN COMPANY VALUE MEDIATED BY RETURN ON INVESTMENT*. *8*(3), 673–687.

Iman, C., Nurfatma, F., & Pujianti, N. (2023). Pengaruh Likuiditas dan Profitabilitas Terhadap Nilai Perusahaan. *Jurnal Mutiara Ilmu Akuntansi*, *2*(1), 56–66. https://doi.org/10.55606/jumia.v2i1.2276

Jaya, A., Kuswandi, S., Prasetyandari, C. W., Baidlowi, I., Mardiana, Ardana, Y., Sunandes, A., Nurlina, Panus, & Muchsidin, M. (2023). *Manajemen Keuangan*. PT Global Eksekutif Teknologi.

KEMENTERIAN ENERGI DAN SUMBER DAYA MINERAL. (2019). *Inventarisasi Emisi GRK Sektor Energi*.

Komara, A., Fristianti, E., & Novi, N. (2024). The Effect of Environmental Costs, Environmental Disclosure, Environmental Performance, and Profitability on Firm Value. *Journal Research of Social Science, Economics, and Management*, *3*(10), 1852–1863. https://doi.org/10.59141/jrssem.v3i10.645

Kristina. (2021). *Apa Itu Emisi Karbon? Kenali Penyebab, Dampak, dan Cara Menguranginya*. https://www.detik.com/edu/detikpedia/d-5796741/apa-itu-emisi-karbon-kenali-penyebab-dampak-dan-cara-menguranginya

Mardiana, I. A., & Wuryani, E. (2019). Pengaruh Kinerja Lingkungan terhadap Nilai Perusahaan dengan Profitabilitas sebagai Variabel Pemoderasi. *Jurnal Akuntansi Unesa*, *8*(1), 1–8.

Marini, & Vinola Herawaty. (2024). Pengaruh Pengungkapan Emisi Karbon, Eco-Efficiency dan Pertumbuhan Penjualan terhadap Nilai Perusahaan dengan Profitabilitas sebagai Variabel Moderasi. *El-Mal: Jurnal Kajian Ekonomi & Bisnis Islam*, *5*(8), 3670–3686. https://doi.org/10.47467/elmal.v5i8.3646

Meiryani, Huang, S. M., Warganegara, D. L., Ariefianto, M. D., Teresa, V., & Oktavianie, H. (2023). The Effect of Industrial Type, Environmental Performance and Leverage on Carbon Emission Disclosure: Evidence from Indonesian LQ45 Companies. *International Journal of Energy Economics and Policy*, *13*(4), 622–633. https://doi.org/10.32479/ijeep.14466

Mia Fitriani, & Puji Endah Purnamasari. (2023). Peran Profitabilitas dalam Memoderasi Kinerja Lingkungan, Islamic Social Reporting dan Ukuran Dewan Komisaris Terhadap Nilai Perusahaan. *Syarikat: Jurnal Rumpun Ekonomi Syariah*, *6*(1), 49–62. https://doi.org/10.25299/syarikat.2023.vol6(1).12614

Mustikaningrum, D., Kristiawan, K., & Suprayitno, S. (2021). Emisi Gas Rumah Kaca Sektor Pertanian di Kabupaten Tuban: Inventarisasi dan Potensi Aksi Mitigasi. *Jurnal Wilayah Dan Lingkungan*, *9*(2), 155–171. https://doi.org/10.14710/jwl.9.2.155-171

Nashrulloh, F. A., & Achyani, F. (2024). *Analisis Eco Efficiency , Green Inovation , Carbon Emission Disclosure , Financial Performance Terhadap Nilai Perusahaan*. *3*(5), 3663–3674.

Ningsih, S., & Dukalang, H. H. (2019). Penerapan Metode Suksesif Interval pada Analsis Regresi Linier Berganda. *Jambura Journal of Mathematics*, *1*(1), 43–53. https://doi.org/10.34312/jjom.v1i1.1742

Paramita, V. S., & Ali, A. (2023). Can Profitability Moderate the Impact of Green Investment, Corporate Social Responsibility, and Good Corporate Governance on Company Value on the SRI-KEHATI Index? *International Journal of Finance Research*, *4*(4), 320–338. https://doi.org/10.47747/ijfr.v4i4.1604

Prasetio, D., & Prijanto, B. (2024). *MODERASI PADA PERUSAHAAN SUB SEKTOR INDUSTRI DASAR DAN KIMIA YANG TERDAFTAR DI BURSA EFEK INDONESIA PERIODE 2019-2022*. *10*(September), 294–303.

Pratama, D. R., Reptiningsih, E., & Setyaningsih, E. D. (2024). *Pengaruh Green Accounting , Kinerja Lingkungan , dan Ukuran Perusahaan Terhadap Nilai Perusahaan Pada Perusahaan Sektor Pertambangan Yang Terdaftar Di Bursa Efek Indonesia*. *4*(1), 2873–2885.

Putri, A. A., & Paramita, V. S. (2025). The Effect of ESG Disclosure, Green Investment, and Carbon Emission Disclosure on the Value of Energy Companies in Indonesia: Analysis for the 2019-2023 Period. *Sinergi International Journal of Accounting and Taxation*, *3*(1), 16–33. https://doi.org/10.61194/ijat.v3i1.406

Rahelliamelinda, L., & Handoko, J. (2024). PROFITABILTAS SEBAGAI MODERATING PENGARUH KINERJA ESG, GREEN INNOVATION, ECO-EFFICIENCY TERHADAP NILAI PERUSAHAAN. *JURNAL INFORMASI, PERPAJAKAN, AKUNTANSI, DAN KEUANGAN PUBLIK*, *19*(1), 145–170. https://doi.org/10.25105/jipak.v19i1.19191

Rahmianingsih, A., & Malau, M. (2022). International Journal of Social Service and Research Carbon Emission Disclosure and Firm Value: Does Eco-Efficiency Moderate This Relationship? *International Journal of Social Service and Research*, *2*(12), 1310–1324.

Ramdani, K. E., & Nugraha, A. A. (2022). Pengaruh Pengungkapan Emisi Karbon dan Leverage Terhadap Nilai Perusahaan The Effect of Carbon Emissions Disclosure and Leverage on Firm Value. *COMSERVA Jurnal Penelitian Dan Pengabdian Masyarakat*, *2*(6), 510–518.

Ritchie & Roser. (2020). *How much CO_2 does the world emit? Which countries emit the most?* https://ourworldindata.org/co2-emissions#article-citation

Rohiman, N. K., & Ramli, R. (2025). Pengaruh Profitabilitas, Likuiditas, Aktivitas, dan Ukuran Perusahaan terhadap Struktur Modal (Studi pada Perusahaan Subsektor Transportasi yang

Terdaftar di Bursa Efek Indonesia Periode 2020-2023). *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *8*(3), 2724–2733. https://doi.org/10.54371/jiip.v8i3.7233

Rusmana, O., & Purnaman, S. M. N. (2020). PENGARUH PENGUNGKAPAN EMISI KARBON DAN KINERJA LINGKUNGAN TERHADAP NILAI PERUSAHAAN. *Jurnal Ekonomi, Bisnis, Dan Akuntansi*. https://doi.org/https://doi.org/10.32424/jeba.v22i1.1563

Sutrisno. (2017). *Manajemen Keuangan*. EKONISIA.

Wisnu Pratama, A., & Marsono. (2021). FAKTOR FAKTOR RASIO FUNDAMENTAL PERUSAHAAN DALAM MEMENGARUHI HARGA SAHAM (Studi pada Perusahaan Multisektor yang Terdaftar Pada Indeks IDX-30 Tahun 2016-2020). *Diponegoro Journal of Accounting*, *10*(4), 1–14.

Wulandari, R., & Paramita, S. V. (2016). PENGARUH PROFITABILITAS TERHADAP HARGA SAHAM DENGAN STRUKTUR MODAL SEBAGAI VARIABEL INTERVENING PADA SEKTOR PROPERTY & REAL ESTATE YANG TERDAFTAR DI BURSA EFEK INDONESIA PERIODE 2012 – 2016. *Angewandte Chemie International Edition, 6(11), 951–952.*, *4*(1), 2017.

Xaviera, A., & Rahman, A. (2023). Pengaruh Kinerja Esg Terhadap Nilai Perusahaan Dengan Siklus Hidup Perusahaan Sebagai Moderasi : Bukti Dari Indonesia. *Jurnal Akuntansi Bisnis*, *16*(2), 226. https://doi.org/10.30813/jab.v16i2.4382

Yuliandhari, W. S., Saraswati, R. S., Muhammad, Z., & Safari, R. (2023). *Pengaruh Carbon Emission Disclosure , Eco- Efficiency dan Green Innovation Terhadap Nilai Perusahaan*. *7*(April), 1526–1539.

Zanra, S. W., Tanjung, A. R., & Silfi, A. (2020). The Effect Of Good Corporate Governance Mechanism, Company Size, Leverage And Profitability For Carbon Emission Disclosure With Environment Performance As Moderating Variables. *Bilancia: Jurnal Ilmiah Akuntansi*, *4*(2), 148–164.

Zulkifli., A. (2025). *DENGAN PROFITABILITAS SEBAGAI VARIABEL MODERASI*. *0832*, 129–146.