Company Value: Carbon Emission Disclosure, Company Size, and Profitability with Environmental Performance As a Moderating Variable

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Abstract

This study aims to determine the effect of carbon emission disclosure, company size, and profitability on firm value, with environmental performance as a moderating variable. The population of this study was companies in the energy sector and the primary consumer goods industry listed on the Indonesia Stock Exchange (IDX) in 2020–2022. The sample used a purposive sampling technique, with a final sample size of 114 companies. This research method uses a quantitative method with secondary data in the form of annual reports and company sustainability reports. The results show that carbon emission disclosure has a positive effect on firm value. Company size has a positive effect on firm value. Profitability has a positive effect on firm value. Environmental performance can moderate the influence of CED, company size, and profitability on firm value.

Keywords: *Carbon Emission Disclosure*, Company Size, Profitability, Company Value, And Environmental Performance

1. Introduction

The business world in today's era of globalization and digitalization is characterized by increasingly fierce competition and constantly changing market dynamics. Companies are required to focus not only on achieving short-term profits but also on sustainability and increasing company value in the long term. Company value is a crucial indicator reflecting market perceptions of a company's performance, prospects, and investor confidence. Company value can be defined as investors' perceptions of a company's success in implementing effective governance, as reflected in

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its profitability and stock price. A company is considered to have high value if its stock price increases and its profitability demonstrates optimal performance, as these two aspects are key indicators for investors in making investment decisions.(Hardiyansah & Agustini, 2021)The higher the company's value, the greater its attractiveness to investors, creditors, and other stakeholders. The highest level of achievement for a business organization is the ability to achieve optimal company value.(Soge & Brata, 2020).

In the modern business era, a company's sustainability is no longer solely determined by its level of profitability, as conventional wisdom holds, but also by its ability to integrate economic performance, social justice, and responsibility for environmental sustainability.(Fitriana et al., 2024)One way a company can increase its value is through the implementation of good environmental governance practices. A company's positive reputation plays a crucial role in increasing its attractiveness to investors. This enhanced reputation can be achieved through theimplementation of sustainability and corporate social responsibility activities, which not only strengthen the company's image but also attract investor interest, particularly amidst increasing attention to environmental issues.(Yao et al., 2023).

The energy and primary consumer goods sectors are among those experiencing rapid growth. The energy sector encompasses companies involved in the production, distribution, and supply of various energy resources, both fossil and renewable. The primary consumer goods sector encompasses companies focused on the production and distribution of goods and services, generally aimed at meeting basic consumer needs. The following is the average value of companies in the energy and primary consumer goods sectors, measured using Price to Book Value (PBV).

Swalking with development and progressenergy sector and primary consumer goods sectorit turns out Also develop issuesm e regardingEnvironmental pollution such as global warming and carbon emissions. Global warming is a phenomenon of increasing global temperature from year to year periodically due to the concentration of greenhouse gases. Greenhouse Gases are atmospheric gases that function as glass panels in a greenhouse that are tasked with capturing solar heat energy so that it is not completely released back into the atmosphere. The greenhouse gases with the greatest impact are carbon dioxide (CO2), nitrous oxide (NOx), methane (CH4), hydrofluorocarbons (HFCs) and chlorofluorocarbons (CFCs). However, according to the Intergovernmental Panel on Climate Change or IPCC concluded that global warming itself is caused by human activities. The issue of global warming is not only a topic that needs to be discussed in Indonesia, but also in various parts of the world related to its management. This is inseparable from the existence of international political commitments which ultimately underlie the concept of sustainable economic development regulated in the United Nations Framework Convention on Climate Change (UNFCCC).

In implementation UNFCCC about change climate happen somethingan agreement between several countries to reduce GHG emissions known aswithP protocol Kyoto. TermP protocol Kyoto And UNFCCC ownA close relationship exists, with the Kyoto Protocol being a more specific and detailed elaboration of the UNFCCC. Countries that ratify the Kyoto Protocol are automatically legally bound by its policies. The purpose of the Kyoto Protocol is to maintain atmospheric greenhouse gas (GHG) concentrations below levels that could endanger the Earth's climate.

Through mechanism ImplementationB together *(Joint Implementation)*,Emission Trading and Clean Development Mechanism Indonesia has stated its commitment at the Conference of Parties (COP) 15 in 2009 to reduce Greenhouse Gas (GHG) emissions by 26% independently, and

41% with international assistance by 2030, then achieve the target of net zero emissions no later than 2060. In the implementation of Emission Trading, an engineering in accounting science has developed which is often called carbon accounting. Carbon Accounting is the calculation of the amount of carbon emitted by industrial processes, setting reduction targets, establishing systems and programs to reduce carbon emissions, and reporting the progress of these programs. By knowing the amount of carbon emissions in the air as an effect of industrial processes, it is hoped that it can reduce global warming.

Presearchers previouslym show absence consistency between One resultsThis can be seen from research conducted by Anggaraeni (2015), which states that carbon emission disclosure has a positive effect on company value. This research result is supported by Probosari (2019) and Kawedar (2019), which state that there is a significant influence between carbon emission disclosure and stock value. Research conducted by Kelvin et.al (2017) states that carbon emission disclosure has a negative effect on the cost of equity, thus the results indicate that carbon emission disclosure influences company value with operational performance as the intervening variable. Further research, conducted by Saka and Oshika (2014), states that Carbon Emission has no effect on Market Value of Equity.

This study aims to determine the effect of carbon emission disclosure, company size, and profitability on firm value, with environmental performance as a moderating variable. The population of this study was companies in the energy sector and the primary consumer goods industry listed on the Indonesia Stock Exchange (IDX) in 2020–2022. The sample used a purposive sampling technique, with a final sample size of 114 companies. This research method uses a quantitative method with secondary data in the form of annual reports and company sustainability reports. The results show that carbon emission disclosure has a positive effect on firm value. Company size has a positive effect on firm value. Profitability has a positive effect on firm value. Environmental performance can moderate the influence of CED, company size, and profitability on firm value.

Based on backgroundbrear problem the,sowriter interested Forconducted research related to factors that influence carbon emission disclosure, company size, and profitability on company value with environmental performance as a moderating variable, with the research title: Analysis of the Influence of Carbon Emission Disclosure, Company Size, and Profitability on Company Value with Environmental Performance as a Moderating Variable

Theoretical Basis

TheorySstakeholders (Stakeholder (Theory)

Theory *Stakeholder* discuss connection between company with forstakeholders. Stakeholders are individuals, group man,k community or public Good Part andAll those who have an interest in and relationship with the company. This theory, developed by Edward Freeman, emphasizes that companies must provide benefits to stakeholders (government, employees, shareholders, the community, customers, suppliers, and other parties) by providing information related to the company's activities. This information can include company activities that directly affect them. for example:pollution, sponsorship, And iinitiativeSecurity. The primary goal of stakeholder theory is to help corporate management understand the stakeholder environment and manage it effectively. However, the purpose of stakeholders can be broadly understood as helping corporate managers increase value through their activities and minimize losses for stakeholders.

TheorySsignal(Ssignaling(Theory)

Theory signal or signaling theory is something action Which takenCorporate management provides investors with information about how management views the company's prospects. This theory explains why companies are motivated to convey or provide information related to financial reports to external parties. The motivation to convey or provide information related to financial reports to external parties is based on the existence of information asymmetry between company management and external parties (Bergh et al., 2014). Companies or company management have more information regarding company operations and future prospects than external parties such as investors, creditors, underwriters, and other information users. Therefore, to address this problem and reduce the information asymmetry that occurs, what can be done is to provide signals to external parties through the company's financial reports, which contain credible or trustworthy financial information and will provide certainty regarding the company's future sustainability prospects.

MarkPcompany

Mark company measured useP B V . P B V often usedas a measuring tool in calculating company value. PBV itself is a ratio that indicates whether the stock price is overvalued (above) or undervalued (below) the book value of the stock. According to Fakhrudidin & Hadianto (2001), Price to Book Value (PBV) describes how much the market values the book value of a company's shares. The higher this ratio, the more confident the market is in the company's prospects. PBV also indicates the extent to which a company is able to create company value relative to the amount of capital invested. For companies that are running well, this ratio generally reaches above one, indicating that the market value is greater than its book value. The higher the PBV ratio, the more highly the company is valued by investors relative to the funds that have been invested in the company. As for formula used Formeasuring Price to Book Value (PBV) is as follows:

$$\text{PBV} = \underline{\text{Market Priceper Share}}$$

CarbonEmmissionDisclosure

Carbon Emission Disclosure is gas Which issued from results burningCarbon-containing compounds, such as CO2, diesel, LPG, and other fuels. In simple terms, carbon emissions are the release of carbon into the atmosphere. Carbon emissions contribute to climate change along with greenhouse gas emissions. Excessive gas emissions can cause global warming or the greenhouse effect. This results in a significant increase in the earth's temperature. One way to measure carbon emission disclosure is by scoring on a dichotomous scale, as developed by Choi et al. (2013). Each item is worth 1, so if a company fully discloses an item in its report, the company's score is 18, and the minimum score is 0. After obtaining a score for each disclosure item, the next step is to weight it using the following formula:

$$\text{CED= Friday}\underline{\text{lahSkoriginal, t}} \text{ X 100\%Maximum total score}$$

SizePcompany

Size company is variables Which Lots used ForSulastini (2007) explains the social disclosures made by companies in their annual reports. According to Sulastini (2007), large companies generally disclose more information than small companies because they face greater political risks. Theoretically, large companies are not immune to pressure to be socially responsible. Furthermore, larger companies tend to receive more public attention than smaller companies (Sukandar, 2014). Company size is the measure of a company's assets. Company size is measured by the natural logarithm of total assets. The formula for company size is as follows:

$$Ssize=(Ln)Ttotal\ AssetI,t$$ Information :

Ttotal Asset	= TotalAsetPcompany ityear ti =OnCompany i
t	=Onyear t

Performance Environment

Performance environment measured through performance companydnatural followEnvironmental Performance Rating Program (PROPER). The PROPER report published by the Ministry of Environment assesses companies based on their environmental management practices. The better the PROPER score a company receives, the higher the level of stakeholder trust in its environmental stewardship. Gaining stakeholder trust increases the likelihood of achieving a going concern level. PROPER can also be used as a company's signal to its stakeholders. The PROPER rating is as follows:

Table 1.SkoringProper Level

Color	Category	Skor
Gold	VeryBaik	5
Green	Good	4
Blue	Enough	3
Red	Bad	2
Black	VeryBuruk	1

Ssource: Processed by the author

2. Method, Data, and Analysis

Determiner plan study in a way comprehensive Whichb fill inhypothesis and its implications until the final stage, namely analysis, after obtaining the results, conclusions and suggestions are given. This study uses secondary data, namely quantitative data obtained through the Indonesia Stock Exchange and obtained from the website www.idx.com Which consists of fromlreportThe data used in this study are corporate finance and sustainability reports of Indonesian non-financial companies for the 2019-2021 period. Other data, namely the PROPER rating, are sourced from the website of the Ministry of Environment. In this study, the independent variables used are Carbon Emission Disclosure and Company Size. Carbon Emission Disclosure in this study will be denoted as CED. The dependent variable in this study, namely company value, can be proxied by Price to Book Value. This study uses Environmental Performance as a moderating variable and

Leverage as a control variable. The sample in this company is a purposive sampling technique where 199 samples were obtained in this study. This study was conducted using a population of Non-Financial sector companies listed on the IDX during the 2019-2021 period. The analytical method used is a multiple linear regression model, the analytical method in this study is descriptive statistics, classical assumption tests, and hypothesis testing. The statistical data processing tool used is SPSS 25.0 software.

3. Result

Descriptive Analysis Results

Descriptive statistical analysis was conducted to describe the characteristics of each variable in this study. This analysis aims to establish an understanding of the distribution and behavioral patterns of the sample data by providing the minimum, maximum, average (mean), and standard deviation values for each dependent and independent variable.(Ghozali, 2018). The following are the results of the descriptive analysis of this research.

Statistical calculations on 114 data (n) obtained an illustration, that the Mean CED is worth 0.5911, the minimum value is worth 0.33, the maximum value is worth 0.94, and the standard deviation is worth 0.16 with the number of data (n) of 114. The mean value is greater than the standard deviation indicates the data is relatively good. The Mean SIZE is worth 30.1944, the minimum value is worth 27.59, the maximum value is worth 32.83, and the standard deviation is worth 1.29204 with the number of data (n) of 114. The mean value is greater than the standard deviation indicates the data is relatively good; Mean ROA is worth 0.1357, the minimum value is worth 0.00, the maximum value is worth 0.62, and the standard deviation is worth 0.13404 with the number of data (n) of 114. The mean value is greater than the standard deviation indicates the data is relatively good.

Mean PBV is 3.6744, minimum value is 0.2, maximum value is 56.79, and standard deviation is 7.84759 with 114 data (n). A smaller mean value compared to the standard deviation indicates that the data is relatively randomly distributed. The KL mean is 3.3333, minimum value is 3.00, maximum value is 5.00, and standard deviation is 0.63339 with 114 data (n). A larger mean value compared to the standard deviation indicates that the data is relatively good. The CED_KL mean is 2.0234, minimum value is 1.00, maximum value is 4.72, and standard deviation is 0.89186 with 114 data (n). A larger mean value compared to the standard deviation indicates that the data is relatively good. The mean of SIZE_KL is 100.8716, the minimum value is 82.77, the maximum value is 163.78, and the standard deviation is 21.12659 with the number of data (n) of 114. The mean value is greater than the standard deviation indicates that the data is relatively good. The mean of ROA_KL is 0.4706, the minimum value is 0.01, the maximum value is 0.47, and the standard deviation is 0.51486 with the number of data (n) of 114. The mean value is smaller than the standard deviation indicates that the data is relatively randomly distributed.

Table 4.1. Results of Descriptive Statistical Analysis

No	Variables	N	Minimum	Maximum	Mean	Standard Deviation
1	CED	114	0.33	0.94	0.5911	0.16396
2	SIZE	114	27.59	32.83	30, 1944	1.29204

3	ROA	114	0.00	0.62	0.1357	0.13404
4	PBV	114	0.20	56.79	3.6744	7.84759
5	KL	114	3.00	5.00	3.3333	0.63339
6	CED_KL	114	1.00	4.72	2.0234	0.89186
7	SIZE_KL	114	82.77	163.78	100,8716	21,12659
8	ROA_KL	114	0.01	2.47	0.4706	0.51486
9	Valid N (listwise)	114				

Normality Test

A normality test is performed to assess whether the disturbance variables or residuals in a regression model follow a normal distribution. In this study, the Jarque–Bera test was used to test for normality. The assessment criteria for this test are: if the significance value (sig) is greater than 5%, the data are normally distributed. If the significance value (sig) is less than 5%, the data are not normally distributed. The following are the results of the normality test:

Table 4.2. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		114
Normal Parametersa,b	Mean	,0000000
	Standard Deviation	5.71571128
Most Extreme Differences	Absolute	,074
	Positive	,059
	Negative	-,074
Test Statistics		,074
Asymp. Sig. (2-tailed)		,174c

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Based on the normality test, the probability shows a value of $0.174 > 0.05$, so it can be concluded that Ho is accepted and the data is normally distributed. Hypothesis testing for this normal distribution data test uses a two-tailed test by examining the residual data from the regression results.

Multicollinearity Test

The multicollinearity test aims to identify the correlation between independent variables in a regression model. The presence of this correlation indicates multicollinearity, which can affect the accuracy of model estimation. Therefore, a good regression model is expected to be free of multicollinearity. The criteria used to detect multicollinearity are a Variance Inflation Factor (VIF) value of less than 10 and a tolerance value greater than 0.1, indicating that the regression model is free from multicollinearity.

Table 4.3. Multicollinearity Test

Model		Tolerance	VIF
1	(Constant)		
	CED	,321	3,112
	SIZE	,333	3,001
	ROA	,255	3,915
	KL	,457	2,190
	CED_KL	,445	2,245
	SIZE_KL	,423	2,365
	ROA_KL	,629	1,590

Based on the results of the multicollinearity test, the test results have a VIF value < 10 and Tolerance > 0.10. From these results, it can be concluded that the regression model is free from multicollinearity problems in the data model used.

Heteroscedasticity Test

The heteroscedasticity test is performed to determine whether the residual variance between observations in the regression model is unequal. This test aims to ensure the consistency of the residual variance in the regression model. The criteria for assessing heteroscedasticity can be observed through a scatterplot. A regression model is considered free of heteroscedasticity if the residual points are randomly distributed, do not form a specific pattern, and are evenly distributed above and below the Y-axis.

Table 4.4. Heteroscedasticity Test
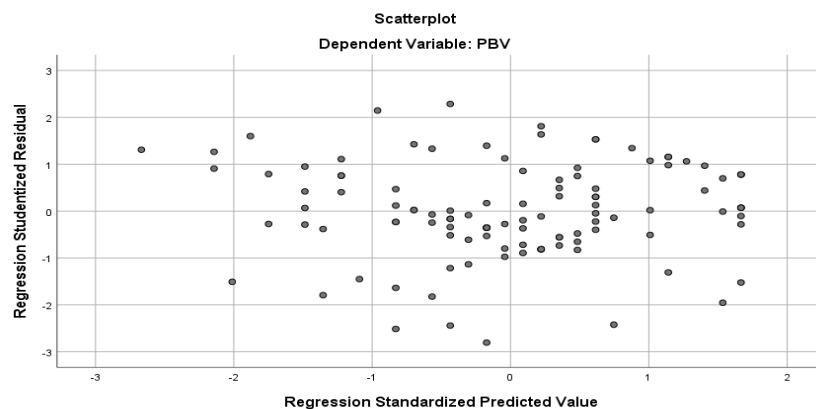
Based on Table 4.5 in the heteroscedasticity test, it shows that the distribution points do not form a certain pattern or are random and are spread above zero on the Y axis, so it can be concluded that the data does not contain any heteroscedasticity elements.

Autocorrelation Test

The autocorrelation test is used to determine whether errors are conditional or related to each other over a period of time. The term "autocorrelation" describes the relationship that develops when members of a set of observations are arranged in a regular temporal pattern. The criteria used to determine whether autocorrelation occurs or not can be explained using the DW value where it is said that there is no positive or negative autocorrelation if the DW value is between DU and 4-DU if the following equation is made (DU < DW < 4-DU).

Table 4.5. Autocorrelation Test

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,759^a	,746	,722	2,02571	1,946

a. Predictors: (Constant), ROA_KL, SIZE , KL, CED , ROA , CED_KL , SIZE_KL

b. Dependent Variable: PBV

Based on Table 4.6 in the autocorrelation test, it shows that the DW value = 1.94 is between the DU value = 1.82 and 4-DU = 2.18, which means that the data is free from autocorrelation problems.

Moderated Regression Analysis (MRA) Equation Hypothesis Test

Table 4.6. MRA test

Coefficientsa

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	,027	,003		8,889	,000		
	CED	,036	,008	,035	4,412	,000	,321	3,112
	SIZE	,237	,034	,378	6,932	,000	,333	3,001
	ROA	,540	,071	,584	7,617	,000	,255	3,915
	KL	,449	,159	,446	2,825	,006	,457	2,190
	CED_KL	,474	,173	,346	2,742	,008	,445	2,245
	SIZE_KL	,252	,102	,254	2,470	,015	,423	2,365
	ROA_KL	,276	,080	,290	3,438	,001	,629	1,590

a. Dependent Variable: PBV

The results of the moderated regression analysis can be interpreted as follows. A constant of 0.27 indicates that if the variables CED, SIZE ROA, KL, CED_KL, SIZE_KL and ROA_KL are constant, the PBV variable is worth 0.27 units. The CED variable has a coefficient of 0.036 indicating that if the CED variable increases by 1 level, it will also increase the PBV variable by 0.036 units, with constant conditions on the others. The SIZE variable has a coefficient of 0.237 indicating that if the SIZE variable increases by 1 level, it will also increase the PBV variable by 0.237 units, with constant conditions on the others. The ROA variable has a coefficient of 0.54 indicating that if the

ROA variable increases by 1 level, it will also increase the PBV variable by 0.54 units, with constant conditions on the others. The KL variable has a coefficient of 0.449 indicating that if the KL variable increases by 1 level, it will also increase the PBV variable by 0.449 units, with constant conditions on the others. The CED_KL variable has a coefficient of 0.474 indicating that if the CED_KL variable increases by 1 level, it will also increase the PBV variable by 0.474 units, with constant conditions on the others. The SIZE_KL variable has a coefficient of 0.252 indicating that if the SIZE_KL variable increases by 1 level, it will also increase the PBV variable by 0.252 units, with constant conditions on the others. The ROA_KL variable has a coefficient of 0.276 indicating that if the ROA_KL variable increases by 1 level, it will also increase the PBV variable by 0.276 units, with constant conditions on the others.

t-test

The t-test was used to demonstrate the influence of environmental performance as a moderating variable on the partial relationship between carbon emissions disclosure, company size, and profitability on company value, assuming other factors remain constant. The test results can be seen in Table 4.8.

Table 4.7. t-Test Results

Coefficientsª

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,027	,003		8,889	,000		
	CED	,036	,008	,035	4,412	,000	,321	3,112
	SIZE	,237	,034	,378	6,932	,000	,333	3,001
	ROA	,540	,071	,584	7,617	,000	,255	3,915
	KL	,449	,159	,446	2,825	,006	,457	2,190
	CED_KL	,474	,173	,346	2,742	,008	,445	2,245
	SIZE_KL	,252	,102	,254	2,470	,015	,423	2,365
	ROA_KL	,276	,080	,290	3,438	,001	,629	1,590

a. Dependent Variable: PBV

The results of data processing show that: First, Test the Effect of CED on PBV. Sig value = 0.000 < Level of Significant = 0.05, then Ho is rejected or Ha is accepted, meaning it can be concluded that there is a positive and significant effect of CED on PBV. Second, Test the Effect of SIZE on PBV. The results of data processing show a value of Sig. = 0.000 < Level of Significant = 0.05, then Ho is rejected or Ha is accepted, meaning it can be concluded that there is a positive and significant effect of SIZE on PBV. Third, Test the Effect of ROA on PBV. The results of data processing show a value of Sig. = 0.000 < Level of Significant = 0.05, then Ho is rejected or Ha is accepted, meaning it can be concluded that there is a positive and significant effect of ROA on PBV. Fourth, Test the Effect of KL on PBV. The results of data processing show a value of Sig. = 0.006 < Level of Significant = 0.05, then Ho is rejected or Ha is accepted, meaning that it can be concluded that there is a positive and significant influence of KL on PBV. Fifth, Test the Moderation Effect of KL on the Influence of CED with PBV. The results of data processing show a value of Sig. = 0.008 < Level of Significant = 0.05, then Ho is rejected or Ha is accepted, meaning that it can be concluded that there is a positive and significant moderating effect of KL on the influence of CED with PBV. Sixth, Test

the Moderation Effect of KL on the Influence of SIZE with PBV. The results of data processing show a value of Sig. = 0.015 < Level of Significant = 0.05, then Ho is rejected or Ha is accepted, meaning that it can be concluded that there is a positive and significant moderating effect of KL on the influence of SIZE with PBV. Seventh, Test the Moderation Effect of KL on the Influence of ROA with PBV. The results of data processing show a value of Sig. = 0.001 < Level of Significant = 0.05, then Ho is rejected or Ha is accepted, meaning that it can be concluded that there is a positive and significant moderating effect of KL on the influence of ROA with PBV.

Coefficient of Determination (R²) Test

The coefficient of determination (R^2) test is used to explain the extent to which the independent variable is able to explain the variation in the dependent variable. The coefficient of determination value is in the range of $0 < R^2 < 1$, which indicates that the R^2 value ranges from zero to one. The closer the value is to one, the stronger the explanatory power of the model, while an R^2 value close to zero indicates a weak explanatory power. Furthermore, Hair et al. (2019) grouped the coefficient of determination values into three categories: a weak category with an R^2 value of less than or equal to 25 percent, a moderate category with an R^2 value of more than 25 percent to 50 percent, and a strong category with an R^2 value of 75 percent or more.

Adjusted R Square used to overcome the limitations and potential biases present in the coefficient of determination, thus obtaining a more accurate and representative model. The following presents the results of data processing using the coefficient of determination aimed at obtaining the Adjusted R Square value.

Table 4.8. Adjusted R Square Test
Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate	Durbin-Watson
1	,759a	,746	,722	2.02571	1,946

a. Predictors: (Constant), ROA_KL, SIZE , KL, CED , ROA , CED_KL , SIZE_KL
b. Dependent Variable: PBV

Based on the regression output presented in Table 4.9, the Adjusted R Square value is 0.722. This indicates that the independent variable is able to explain 72.2 percent of the variation in the dependent variable, while the remainder is explained by other factors not included in the research model. Referring to the criteria proposed by Hair et al. (2019), Adjusted R Square values that are in the range of more than 50 percent to 75 percent are included in the category of moderate levels of variable engagement. Thus, the regression model used has adequate predictive ability and can be considered quite reliable as a prediction tool.

4. Discussion

The results of this study are consistent with several previous studies. Research by Luo, Tang, and Lan (2013) found that carbon emission disclosure positively impacts firm value because it increases transparency and corporate reputation. Furthermore, Matsumura, Prakash, and Vera-Muñoz (2014) showed that companies that disclose carbon emission information more transparently tend to receive higher market valuations than companies that do not. Other studies by Jannah and Muid (2014) and Putri and Yulianto (2021) also found that carbon emission disclosure positively impacts

firm value, as measured by PBV. Investors can consider the level of carbon emission disclosure as an indicator in investment decision-making, as companies with good carbon emission disclosure tend to have more manageable environmental risks and higher firm value.

Disclosure of carbon emissions is a form of information transparency, and investors will view this as a tangible sign of environmental concern and commitment to social and environmental responsibility. As an application of signaling theory, because companies voluntarily provide necessary information to investors, carbon emissions disclosure can have a positive impact on investors.(Noor & Ginting, 2022)Disclosure of carbon emissions information demonstrates a company's concern for the environment, garnering a positive market response and serving as a basis for investors to assess the company. Environmental performance also strengthens the influence of carbon emissions disclosure on company value, as environmental performance is assessed according to ISO 14001.(Hardiyansah et al., 2021). Environmental responsibility is one way to increase competitive advantage for companies and investor confidence.(Okpala & Iredele, 2019).

A large company size tends to increase investor confidence in investing, thus increasing the company's firm value. Large companies also have easy access to capital markets due to their flexibility and ability to raise funds. This ease of access is seen by potential investors and investors as a positive signal for investment decision-making, reflecting the company's future value, as well as its favorable growth prospects. Therefore, company size can positively influence firm value.(Jaya, 2020).

Lumoly et al., (2022) states that company size can influence company value. Company size reflects the total assets a company possesses. As a company grows, investors tend to be more interested in the company, which increases its value in the eyes of investors. This increase in company value can be demonstrated by a higher increase in total assets compared to liabilities. This is because larger companies have a more stable environment. This size is also known to have significant potential for environmental disclosure.

5. Conclusion, Limitations, and Suggestions

Conclusion

In energy and primary consumer goods companies listed on the IDX during the 2020–2022 period, transparency in Carbon Emission Disclosure (CED) disclosures positively impacted firm value. This indicates that increased corporate carbon emission disclosure can increase firm value.

Company size has a positive effect on company value in energy sector companies and primary consumer goods industry listed on the IDX for the 2020-2022 period. This indicates that every increase in company size will increase company value, which means that companies with larger sizes tend to have higher company value in the eyes of investors.

Environmental performance moderates the effect of company size on firm value in energy and primary consumer goods companies listed on the Indonesia Stock Exchange (IDX) during the 2020-2022 period. This indicates that good environmental performance strengthens the positive effect of company size on firm value. In other words, large companies will experience a higher increase in PBV if supported by good environmental performance.

Environmental performance moderates the effect of company size on firm value in energy and primary consumer goods companies listed on the Indonesia Stock Exchange (IDX) during the 2020-

2022 period. This indicates that good environmental performance strengthens the positive effect of company size on firm value. In other words, large companies will experience a higher increase in PBV if supported by good environmental performance.

Environmental performance moderates the effect of profitability on firm value in energy and primary consumer goods companies listed on the Indonesia Stock Exchange (IDX) for the 2020-2022 period. This indicates that good environmental performance strengthens the positive influence of profitability (ROA) on firm value. In other words, companies with high profitability will experience a greater increase in firm value (PBV) when supported by good environmental performance.

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