

THE EFFECT OF ESG DISCLOSURE, CSR DISCLOSURE, AND GREEN INVESTMENT ON FIRM VALUE WITH FIRM SIZE AS A MODERATING VARIABLE IN ENERGY SECTOR COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE

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ABSTRACT

This study aims to analyze the effects of ESG Disclosure, CSR Disclosure, and Green Investment on Firm Value and to examine the moderating role of Firm Size in energy sector companies listed on the Indonesia Stock Exchange. The study employs a quantitative approach using purposive sampling, with secondary data obtained from annual reports and sustainability reports. Data were analyzed using Moderated Regression Analysis with SPSS. The results of the first equation, which examines the direct effects of the independent variables on Firm Value, show that ESG Disclosure has no significant effect on Firm Value, while CSR Disclosure and Green Investment have negative and significant effects on Firm Value. The results of the second equation, which incorporates Firm Size and the interaction terms, show that Firm Size has a positive and significant direct effect on Firm Value. However, Firm Size does not moderate the effect of ESG Disclosure, CSR Disclosure, or Green Investment on Firm Value. These findings indicate that Firm Size contributes directly to Firm Value but does not strengthen or weaken the relationships between sustainability-related factors and market valuation. The results also suggest that greater sustainability disclosure and environmentally oriented investment are not necessarily translated into higher market valuation, highlighting the importance of the quality, relevance, and economic implications of sustainability practices for investors.

INTRODUCTION

Sustainability issues have become increasingly embedded in the assessment of corporate activities because corporate responsibility concerns not only shareholders but also parties that have an interest in the company's activities, as explained in Stakeholder Theory (Freeman, 1984). Information disclosed by companies can also serve as a signal to investors in reducing information asymmetry between companies and the market (Spence, 1973). In the context of sustainability, Environmental, Social, and Governance Disclosure reflects corporate

transparency regarding non-financial performance and risks related to environmental, social, and governance aspects (Boffo & Patalano, 2020). Friede et al. (2015) position ESG as reporting on three non-financial dimensions related to accountability to stakeholders. Corporate responsibility also encompasses economic, legal, ethical, and philanthropic dimensions as formulated by Carroll (1991), while Elkington (1997) associates corporate responsibility with the dimensions of people, planet, and profit. From the investment perspective, the United Nations Environment Programme [UNEP] (2018) defines green investment as investment directed toward economic activities that support environmental protection and the sustainability of natural resources.

Attention to sustainability disclosure has also grown among energy sector companies in Indonesia. POJK Number 51/POJK.03/2017 provides the basis for the implementation of sustainable finance and the reporting of social and environmental activities by financial services institutions and issuers. In the energy sector, ESG disclosure relates to information concerning environmental management, social responsibility, and corporate governance (Maysari & Endri, 2025). Attention to environmental issues in the energy sector is also reflected in the realized reduction of energy-sector GHG emissions by 127,67 million tons of CO₂ in 2023 (Ministry of Energy and Mineral Resources, 2024). The Indonesia Stock Exchange report (2024) used in this manuscript also notes that stocks of companies with high ESG scores showed more stable performance during periods of market volatility. From the perspective of environmental investment, green investment includes the allocation of capital to assets and activities categorized as green investments (Inderst et al., 2012).

Data on energy sector companies listed on the Indonesia Stock Exchange during 2023–2025 show wide variation in share prices, profits, levels of sustainability disclosure, and investment. Data from 74 issuers indicate that share price movements were not uniform; some issuers experienced increases, while others experienced declines during the same period. Corporate profits also fluctuated, and several issuers recorded losses in certain years. In ESG disclosure, company scores ranged from low levels to 12 indicators, while CSR disclosure covered a broader range, with several companies reaching 24 indicators in 2025. Green investment refers to the allocation of investment directed toward activities and assets that support environmental objectives and sustainable development (Inderst et al., 2012). Investment data from the 74 companies also show substantial differences across companies and periods, including companies that did not record investment values in one or several observation years.

These differences in sustainability disclosure and market performance are directly related to the measurement of Firm Value used in this study. Brigham and Houston (2019) explain firm value as investors' perceptions of a company's success as reflected in share prices and market performance, while Husnan (2019) associates it with the value that investors are willing to pay for a company. This study uses the Price to Earnings Ratio to describe the comparison between share price and earnings per share; therefore, changes in prices and profits among energy sector companies form part of the variation in Firm Value during the observation period. Firm Value can also be measured using market-based indicators such as Tobin's Q, which considers the market value of equity in its measurement (Alfarisyi et al., 2022). For the moderating variable, Firm Size represents the scale of a company based on its resources and public exposure (Ghozali, 2021); Firm Size can also be proxied by total assets, total sales, or market capitalization (Dang et al., 2018).

Previous studies have shown inconsistent relationships between ESG, CSR, green investment, and Firm Value. Suretno et al. (2022) found that the environmental and social dimensions had positive and significant effects on Firm Value, whereas the governance dimension showed a negative direction. D'Amato and Falivena (2020) demonstrated an association between corporate social responsibility and Firm Value, while Abdi et al. (2022) found that ESG Disclosure had a positive relationship with Firm Value. Regarding CSR, Abdi et al. (2022) showed that Firm Size had a moderating role in the relationship between sustainability disclosure and Firm Value and financial performance. Different results were obtained by Amalia and Safitri (2025), who found that ESG Disclosure and Green Investment did not have significant effects on Firm Value. Maysari and Endri (2025) showed that ESG Disclosure had a positive and significant effect on Firm Value. Regarding Green Investment, Asyura et al. (2023) found a negative and insignificant effect on Firm Value.

The differences in previous research findings create a research gap for examining ESG, CSR, and green investment jointly in a single model with Firm Size as a moderating variable in the energy sector. Abdi et al. (2022) showed that Firm Size had a moderating role in the relationship between sustainability disclosure and Firm Value and financial performance. Amalia and Safitri (2025) included ESG and green investment in energy sector companies but did not position Firm Size as a moderator of the three variables used in this study. The literature cited in this manuscript also indicates that the integration of ESG and green investment is related to business sustainability and corporate governance (Eccles, 2014). The position of this study lies in examining ESG Disclosure, CSR Disclosure, and Green Investment on Firm Value in one model, accompanied by three interactions with Firm Size, in energy sector companies listed on the Indonesia Stock Exchange during 2023–2025.

Based on differences in empirical findings and variations in energy sector company data during the study period, this study aims to analyze the effects of ESG Disclosure, CSR Disclosure, and Green Investment on Firm Value and to examine the role of Firm Size in moderating the relationship of each of these variables in energy sector companies listed on the Indonesia Stock Exchange during 2023–2025. This focus limits the analysis to five research variables, energy sector companies on the IDX as the research object, and the 2023–2025 observation period.

RESEARCH METHOD

This study uses an associative method with a quantitative approach to examine the effects of ESG Disclosure, CSR Disclosure, and Green Investment on Firm Value with Firm Size as a moderating variable in energy sector companies listed on the Indonesia Stock Exchange during 2023–2025. The associative approach is used to analyze relationships between two or more variables, while the quantitative approach emphasizes hypothesis testing through statistical data processing (Sugiyono, 2017). The research data are secondary data obtained from annual reports and sustainability reports published through the Indonesia Stock Exchange. The research population consists of 74 energy sector companies, while the sample was determined using purposive sampling based on the criteria of companies listed on the IDX and publishing sustainability reports during the study period. The independent variables in this study include ESG Disclosure (X1), CSR Disclosure (X2), and Green Investment (X3); the dependent variable is Firm Value (Y), while Firm Size (Z) is used as the moderating variable.

ESG Disclosure and CSR Disclosure are measured by comparing the number of items disclosed by the company with the number of indicators used based on the Global Reporting Initiative standards (GRI, 2021). Green Investment is measured by comparing total investment with total company assets, as used by Chang et al. (2021). Data processing was performed using SPSS software. Before hypothesis testing, the model was first examined through a series of classical assumption tests, namely normality, multicollinearity, heteroscedasticity, autocorrelation, and linearity tests. The normality test uses the One-Sample Kolmogorov-Smirnov test, the multicollinearity test refers to the Tolerance and Variance Inflation Factor (VIF) values, the heteroscedasticity test uses the Glejser method, the autocorrelation test uses the Run Test, while the linearity test is conducted using the Lagrange Multiplier (Ghozali, 2021). The model is considered to meet the assumptions if the residuals are normally distributed, there is no multicollinearity, heteroscedasticity, or autocorrelation, and the relationships among variables satisfy the linearity assumption.

The main analysis uses Moderated Regression Analysis (MRA) to assess the effects of the independent variables on Firm Value and to examine the role of Firm Size in strengthening or weakening these relationships (Ghozali, 2021). Testing is conducted through two models, namely Model I: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e$, and Model II: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4Z + b_5(X_1*Z) + b_6(X_2*Z) + b_7(X_3*Z) + e$. The strength of the relationships among variables is analyzed using the correlation coefficient (R) with interpretation criteria based on Siregar (2015), while the model's ability to explain variation in Firm Value is assessed using the coefficient of determination (R^2) (Ghozali, 2021). Hypothesis testing is conducted using the F test to assess the simultaneous effects of the independent variables and the t test to assess the partial effect of each variable, including the effects of interaction variables in the moderation model (Ghozali, 2021).

RESULTS AND DISCUSSION

Classical Assumption Test

a. Normality Test

The normality test was conducted to ensure that the data residuals were normally distributed as a basis for the feasibility of subsequent analysis. In this study, the data were transformed using the natural logarithm (Ln) to improve the data distribution. The normality test was conducted using the Kolmogorov-Smirnov (K-S) method, with the results presented in Table 1.

Table 1. Normality Test Results

Test	Value
N (Sample)	135
Test Statistic	0.095
Asymp.Sig.(2-tailed)	.200 ^{c,d}
a. Test distribution is Normal.	

Source: Processed Data, 2026

Based on Table 1, the Kolmogorov-Smirnov test results show a significance value of $0.200 > 0.05$; therefore, the residuals in the regression model are normally distributed and satisfy the normality assumption.

b. Multicollinearity Test

The multicollinearity test was conducted to ensure that there was no high correlation among the independent variables. The model is considered free from multicollinearity if the Tolerance value is > 0.10 and $VIF < 10$. The test results are presented in Table 2.

Table 2. Multicollinearity Test Results

Coefficients ^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	ESG	0.954	1.048
	CSR	0.523	1.913
	GI	0.941	1.063
	FIRM SIZE	0.528	1.892
a. Dependent Variable: FIRM VALUE (PER)			

Source: Processed Data, 2026

Based on the multicollinearity test in Table 2, all independent variables have Tolerance values > 0.10 and $VIF < 10$. Therefore, the regression model is considered free from multicollinearity.

c. Heteroscedasticity Test

The heteroscedasticity test is used to assess the equality of residual variances in the regression model. Testing was conducted using the Glejser method based on the obtained significance values, with the results presented in Table 3.

Table 3. Heteroscedasticity Test Results

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	0.920	0.935		0.984
	ESG	-3.564	2.253	-1.938	0.119
	CSR	1.006	1.316	1.125	0.448
	GI	-8.232	7.175	-1.529	0.256
	FIRM SIZE	-0.018	0.037	-0.273	0.619
	ESG*FIRM SIZE	0.127	0.086	1.803	0.146
	CSR*FIRM SIZE	-0.036	0.051	-1.214	0.480
	GI*FIRM SIZE	0.301	0.279	1.449	0.286
a. Dependent Variable: ABS_RES2					

Source: Processed Data, 2026

Based on the Glejser test results in Table 3, all variables have significance values above 0.05, namely ESG 0.119; CSR 0.448; GI 0.256; Firm Size 0.619; and the interaction variables 0.146; 0.480; and 0.286, respectively. Therefore, the regression model does not indicate heteroscedasticity.

d. Autocorrelation Test

The autocorrelation test was conducted to detect relationships among residuals in different periods within the regression model. The test used the Run Test method, with the results presented in Table 4.

Table 4. Autocorrelation Test Results

Test	Unstandardized Residual
Test Value ^a	-0.03120
Number of Runs	69
Z	-1.396
Asymp. Sig. (2-tailed)	0.163

Source: Processed Data, 2026

Based on the Run Test results in Table 4, the Asymp. Sig. value is $0.163 > 0.05$; therefore, the regression model is considered free from autocorrelation.

e. Linearity Test

The linearity test was conducted to ensure the appropriateness of the regression model form. Testing used the Lagrange Multiplier method by obtaining the calculated C^2 value through the calculation $n \times R^2$, with the results presented in Table 5.

Table 5. Linearity Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.968 ^a	0.937	0.929	0.06564

Predictors: (Constant), GI*FIRM SIZE, ESG*FIRM SIZE, CSR, FIRM SIZE, ESG, GI, CSR*FIRM SIZE.

Source: Processed Data, 2026

Based on Table 5, the linearity test using the *Lagrange Multiplier* method shows an R^2 value of 0.937 with $n = 135$. Therefore, the calculated c^2 value is $135 \times 0.937 = 126.495$. The calculated c^2 value is then compared with the critical c^2 value at $df (n - k)$, namely $135 - 7 = 128$, at a significance level of 0.05, yielding a critical c^2 value of 155.40. Since the calculated c^2 value of 126.495 is lower than the critical c^2 value of 155.40, it can be concluded that the model used has a linear relationship

Hypothesis Test

a. Moderated Regression Analysis (MRA)

The statistical test uses Moderated Regression Analysis (MRA) to analyze the effect of the moderating variable in strengthening or weakening the relationship between the independent and dependent variables. The MRA test is conducted through the following two regression equations.

Equation 1

Equation 1 is used to examine the effects of the independent variables on the dependent variable without involving the moderating variable. The results of Equation 1 without moderation are presented in Table 6.

Table 6. MRA Results (I)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.597	0.036		72.911	0.000
	ESG	0.077	0.094	0.037	0.820	0.416
	CSR	-0.834	0.045	-0.817	-18.511	0.000
	GI	-2.170	0.276	-0.353	-7.859	0.000

a. Dependent Variable: FIRM VALUE (PER)

Source: Processed Data, 2026

Based on Table 6, the following regression equation is obtained:

$$Y = 2.597 + 0.077X_1 - 0.834X_2 - 2.170X_3 + e$$

The interpretation is as follows:

- The constant of 2.597 indicates that when ESG, CSR, and Green Investment are equal to zero, the Firm Value (PER) value is 2.597.
- The ESG coefficient of 0.077 indicates a positive relationship; therefore, each one-unit increase in ESG will increase Firm Value (PER) by 0.077.
- The CSR coefficient of -0.834 indicates a negative relationship; therefore, each one-unit increase in CSR will decrease Firm Value (PER) by 0.834.
- The GI coefficient of -2.170 indicates a negative relationship; therefore, each one-unit increase in Green Investment will decrease Firm Value (PER) by 2.170.

Equation 2

Equation 2 is used to examine the effects of the independent variables on the dependent variable by involving the moderating variable. The results of Equation 2 are presented in Table 7.

Table 7. MRA Results (II)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.990	0.288		6.909	0.000
	ESG	0.578	0.694	0.276	0.833	0.408
	CSR	-1.279	0.405	-1.254	-3.153	0.003
	GI	0.759	2.210	0.124	0.343	0.733
	FIRM SIZE	0.027	0.011	0.355	2.405	0.020
	ESG*FIRM SIZE	-0.017	0.026	-0.217	-0.658	0.513
	CSR*FIRM SIZE	0.010	0.016	0.285	0.617	0.540
	GI*FIRM SIZE	-0.112	0.086	-0.475	-1.309	0.196
a. Dependent Variable: FIRM VALUE (PER)						

Source: Processed Data, 2026

Based on Table 7, the following moderated regression equation is obtained:

$$Y = 1.990 + 0.578X_1 - 1.279X_2 + 0.759X_3 + 0.027Z - 0.017X_1*Z + 0.010X_2*Z - 0.112X_3*Z + e$$

The interpretation of the regression coefficients is as follows:

- The constant value of 1.990 (positive) indicates that when ESG, CSR, and GI with Firm Size as the moderator are equal to zero (0), the value of Firm Value (PER) is 1.990.
- The ESG variable (X1) has a value of 0.578 and is positive; therefore, if the ESG variable increases by one-unit, Firm Value (PER) will increase by 0.578.
- The CSR variable (X2) has a value of -1.279 and is negative; therefore, if the CSR variable increases by one-unit, Firm Value (PER) will decrease by 1.279.
- The GI variable (X3) has a value of 0.759 and is positive; therefore, if the GI variable increases by one-unit, Firm Value (PER) will increase by 0.759.

- e) The Firm Size variable (Z) has a value of 0.027 and is positive; therefore, if Firm Size increases by one-unit, Firm Value (PER) will increase by 0.027.
- f) The ESG*Firm Size variable (X1*Z) has a value of -0.017 and is negative; therefore, if ESG with Firm Size as the moderating variable increases by one-unit, Firm Value (PER) will decrease by 0.017.
- g) The CSR*Firm Size variable (X2*Z) has a value of 0.010 and is positive; therefore, if CSR with Firm Size as the moderating variable increases by one-unit, Firm Value (PER) will increase by 0.010.
- h) The GI*Firm Size variable (X3*Z) has a value of -0.112 and is negative; therefore, if GI with Firm Size as the moderating variable increases by one-unit, Firm Value (PER) will decrease by 0.112.

b. Correlation Coefficient Analysis (R)

The correlation coefficient test is used to assess the strength of the relationship between the independent and dependent variables, including changes in the relationship after including the moderating variable. The test results for the first and second models are presented in Tables 8 & 9.

Table 8. Correlation Coefficient Test Results (R) Equation (I)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942a	0.888	0.882	0.08452

Predictors: (Constant), GI, CSR, ESG.

Source: Processed Data, 2026

Based on Table 8 for Equation I, the correlation coefficient (R) value of 0.942 indicates a very strong relationship between ESG, CSR, and Green Investment and Firm Value. Therefore, the three independent variables have a very strong association with the dependent variable.

The results of the correlation coefficient analysis for Equation II are presented in Table 9.

Table 9. Correlation Coefficient Test Results (R) Equation (II)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.968a	0.937	0.929	0.06564

Predictors: (Constant), GI*FIRM SIZE, ESG*FIRM SIZE, CSR, FIRM SIZE, ESG, GI, CSR*FIRM SIZE

Source: Processed Data, 2026

Based on Table 9, in the second equation model, the correlation coefficient (R) value of 0.968 indicates a very strong relationship between ESG, CSR, and Green Investment and Firm Value after including Firm Size as a moderating variable. This result indicates that the presence of Firm Size is associated with a strengthening of the relationships among variables in the model.

c. Coefficient of Determination Analysis (R²)

The coefficient of determination (R²) test is used to measure the model's ability to explain variation in Firm Value. In Equation I, the R² value of 0.888 indicates that ESG, CSR, and GI are able to explain 88.8% of the variation in Firm Value, while 11.2% is explained by other factors outside the model. In Equation II, after including Firm Size as a moderating variable, the R² value increases to 0.937, so the model's ability to explain variation in Firm Value increases to 93.7%, with the remaining 6.3% explained by other factors outside this study.

d. Simultaneous Effect Test (F Statistical Test)

The F test is used to examine the simultaneous significance of the regression model in assessing the simultaneous effects of the independent variables on the dependent variable. The test results are presented in Tables 10 & 11.

Table 10. Simultaneous Test Results (F Test) Equation (I)

Model	Sum of Squares	Mean Square	F	Significance
Regression	3.330	1.110	155.372	.000b
Residual	0.422	0.007		
Dependent Variable: FIRM VALUE (PER)				
Predictors: (Constant), GI, CSR, ESG				

Source: Processed Data, 2026

Based on Table 10, the calculated F value is $155.372 >$ the F-table value of 2.67, with a significance value of $0.000 < 0.05$. Therefore, ESG, CSR, and GI simultaneously affect Firm Value.

The test results for Equation II are presented in Table 11.

Table 11. Simultaneous Test Results (F Test) Equation (II)

Model	Sum of Squares	Mean Square	F	Significance
Regression	3.515	0.502	116.548	.000b
Residual	0.237	0.004		
Dependent Variable: FIRM VALUE (PER)				
Predictors: (Constant), GI*FIRM SIZE, ESG*FIRM SIZE, CSR, FIRM SIZE, ESG, GI, CSR*FIRM SIZE				

Source: Processed Data, 2026

Based on Table 11, the calculated F value is $116.548 >$ the F-table value of 2.08, with a significance value of $0.000 < 0.05$. Therefore, ESG, CSR, Green Investment, and Firm Size simultaneously affect Firm Value.

e. Partial Effect Test (t Statistical Test)

The t test is used to examine the partial effect of each independent variable on the dependent variable. The test results for the first and second models are presented in Tables 12 & 13.

Table 12. Partial Test Results (t Test) Equation (I)

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.597	0.036		72.911	0.000
ESG	0.077	0.094	0.037	0.820	0.416
CSR	-0.834	0.045	-0.817	-18.511	0.000
GI	-2.170	0.276	-0.353	-7.859	0.000
a. Dependent Variable: FIRM VALUE (PER)					

Source: Processed Data, 2026

Based on Table 12, with a t-table value of 1.65657, the partial test results can be summarized as follows:

- ESG (X1) has a significance value of $0.416 > 0.05$ and a calculated t value of $0.820 < 1.65657$; therefore, ESG does not have a significant effect on Firm Value.

- b) CSR (X2) has a significance value of $0.000 < 0.05$ and a calculated t value of $18.511 > 1.65657$; therefore, CSR has a significant negative effect on Firm Value.
- c) Green Investment (X3) has a significance value of $0.000 < 0.05$ and a calculated t value of $7.859 > 1.65657$; therefore, GI has a significant negative effect on Firm Value.

Furthermore, the t-test results for the second model are presented in Table 13.

Table 13. Partial Test Results (t Test) Equation (II)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.990	0.288		6.909	0.000
	ESG	0.578	0.694	0.276	0.833	0.408
	CSR	-1.279	0.405	-1.254	-3.153	0.003
	GI	0.759	2.210	0.124	0.343	0.733
	FIRM SIZE	0.027	0.011	0.355	2.405	0.020
	ESG*FIRM SIZE	-0.017	0.026	-0.217	-0.658	0.513
	CSR*FIRM SIZE	0.010	0.016	0.285	0.617	0.540
	GI*FIRM SIZE	-0.112	0.086	-0.475	-1.309	0.196

a. Dependent Variable: FIRM VALUE (PER)

Source: Processed Data, 2026

Based on Table 13, with a t-table value of 1.65694, the partial test results can be explained as follows:

- a) ESG (X1) has a significance value of $0.408 > 0.05$ and a calculated t value of $0.833 < 1.65694$; therefore, ESG does not have a significant effect on Firm Value.
- b) CSR (X2) has a significance value of $0.003 < 0.05$ and a calculated t value of $3.153 > 1.65694$; therefore, CSR has a significant negative effect on Firm Value.
- c) Green Investment (X3) has a significance value of $0.733 > 0.05$ and a calculated t value of $0.343 < 1.65694$; therefore, GI does not have a significant effect on Firm Value.
- d) Firm Size (Z) has a significance value of $0.020 < 0.05$ and a calculated t value of $2.405 > 1.65694$; therefore, Firm Size has a significant and positive effect on Firm Value.
- e) The ESG*Firm Size interaction has a significance value of $0.513 > 0.05$; therefore, Firm Size does not moderate the effect of ESG on Firm Value.
- f) The CSR*Firm Size interaction has a significance value of $0.540 > 0.05$; therefore, Firm Size does not moderate the effect of CSR on Firm Value.
- g) The GI*Firm Size interaction has a significance value of $0.196 > 0.05$; therefore, Firm Size does not moderate the effect of Green Investment on Firm Value.

DISCUSSION

The Effect of ESG Disclosure on Firm Value

Based on the test results in Equation I, ESG Disclosure does not have a significant effect on Firm Value. The ESG regression coefficient of 0.077 indicates a positive direction of the relationship, but the significance value of 0.416 and the calculated t value of 0.820 indicate that an increase in ESG Disclosure has not produced a meaningful change in the Firm Value (PER) of energy sector companies during the study period. This finding indicates that the extent of environmental, social, and governance information disclosed by companies has not yet become

a consideration that is directly reflected in market valuation. Therefore, although companies are increasingly transparent in disclosing ESG information, the level of disclosure has not been sufficient to drive changes in Firm Value. This result is consistent with Wulandari and Istiqomah (2024), who did not find a positive effect of ESG on Firm Value. A different result was obtained by Maysari and Endri (2025), who showed that ESG Disclosure had a positive and significant effect on Firm Value.

The Effect of CSR Disclosure on Firm Value

Based on the test results in Equation I, CSR Disclosure has a negative and significant effect on Firm Value. The regression coefficient of -0.834 indicates that an increase in CSR Disclosure is associated with a decrease in the company's PER, supported by a significance value of 0.000 and a calculated t value of -18.511. This result indicates that broader disclosure of social responsibility information was not followed by an increase in market valuation during the study period. This condition shows that broader CSR disclosure does not always receive a positive response from the market and, in this study, instead shows a relationship in the opposite direction to Firm Value. This finding is consistent with Achyani et al. (2024), who found that CSR Disclosure had a negative and significant effect on Firm Value. In contrast, Aurora et al. (2021) showed that CSR had a positive and significant effect on Firm Value.

The Effect of Green Investment on Firm Value

Based on the test results in Equation I, Green Investment has a negative and significant effect on Firm Value. The regression coefficient of -2.170 indicates that an increase in the proportion of Green Investment is associated with a decrease in PER, with a significance value of 0.000 and a calculated t value of -7.859. This result indicates that investment allocation oriented toward environmental aspects has not been reflected in an increase in Firm Value during the study period. Among the energy sector companies in the research sample, an increase in the proportion of green investment instead shows a negative relationship with market valuation as proxied by PER. The negative direction of this relationship is consistent with the findings of Asyura et al. (2023), although that study did not find a significant effect. Meanwhile, this result differs from Widarwati et al. (2024), who showed that Green Investment had a positive effect on Firm Value.

The Effect of Firm Size on Firm Value

The test results in Equation II show that Firm Size has a positive and significant effect on Firm Value. The regression coefficient of 0.027, with a significance value of 0.020 and a calculated t value of 2.405, indicates that an increase in Firm Size is followed by an increase in Firm Value. This result indicates that companies with a larger asset scale tend to have stronger resources, operational capacity, and management capabilities. These conditions can increase investors' confidence in the company's continuity, thereby encouraging better market valuation. This finding is consistent with Parnata et al. (2023), who found that Firm Size had a positive and significant effect on Firm Value. Similar results were also found by Dyah et al. (2025) for energy sector companies listed on the Indonesia Stock Exchange. However, this result differs from Alifian and Susilo (2024), who found that Firm Size did not affect the Firm Value of energy sector companies. These differences indicate that the effect of Firm Size on Firm Value may vary according to company characteristics and the research period.

Firm Size Moderates the Effect of ESG Disclosure on Firm Value

The test results for the interaction between ESG Disclosure and Firm Size show a significance value of $0.513 > 0.05$ with a coefficient of -0.017 . These results indicate that Firm Size is unable to moderate the effect of ESG Disclosure on Firm Value. The scale of the company, whether large or small, does not significantly change the relationship between the level of ESG disclosure and Firm Value (PER). This result indicates that ESG information has not received different market responses based on Firm Size. This result is consistent with Wulandari and Istiqomah (2024), who found that Firm Size was unable to moderate the effect of ESG on Firm Value. A different result was reported by Maysari and Endri (2025), who showed that Firm Size had a moderating role in the relationship between ESG Disclosure and Firm Value.

Firm Size Moderates the Effect of CSR Disclosure on Firm Value

The interaction between CSR Disclosure and Firm Size shows a significance value of $0.540 > 0.05$ and a coefficient of 0.010 . These results indicate that Firm Size does not moderate the effect of CSR Disclosure on Firm Value. Differences in company asset scale do not cause the effect of CSR disclosure on Firm Value (PER) to become significantly stronger or weaker. This finding indicates that the relationship between CSR and market valuation does not depend on Firm Size in the research sample. This result is consistent with Aurora et al. (2021), who showed that Firm Size was unable to moderate the relationship between CSR and Firm Value. This result differs from Handayati et al. (2022), who found that Firm Size was able to moderate the effect of CSR Disclosure on Firm Value.

Firm Size Moderates the Effect of Green Investment on Firm Value

The test results for the interaction between Green Investment and Firm Size show a significance value of $0.196 > 0.05$ with a coefficient of -0.112 . These results indicate that Firm Size is unable to moderate the effect of Green Investment on Firm Value. This means that differences in Firm Size do not significantly change the relationship between the proportion of environmentally oriented investment and Firm Value (PER). This finding indicates that the impact of Green Investment on market valuation is not determined by the size of a company's assets during the study period. This result is consistent with Rahmawati and Sartika (2025), who found that Firm Size was unable to moderate the effect of Green Investment on Firm Value. In a different moderation model, Widarwati et al. (2024) also did not find strong evidence that governance characteristics proxied by board size were able to moderate the relationship between Green Investment and Firm Value.

CONCLUSIONS AND RECOMMENDATIONS

The results show that ESG Disclosure, CSR Disclosure, and Green Investment jointly affect Firm Value in energy sector companies listed on the Indonesia Stock Exchange. Partially, ESG Disclosure has not shown a meaningful effect on Firm Value, while CSR Disclosure and Green Investment show negative effects. Meanwhile, Firm Size has a positive effect on Firm Value. However, Firm Size has not been proven to strengthen or weaken the relationships between ESG Disclosure, CSR Disclosure, and Green Investment and Firm Value. These findings indicate that Firm Size plays a more direct role in shaping Firm Value than as a factor that changes the relationship between sustainability aspects and market valuation.

From a practical perspective, energy sector companies need to place greater emphasis on the quality and relevance of ESG and CSR disclosures so that the information presented can provide clearer value to investors. Green Investment should also be directed toward activities that not only meet environmental objectives but also have identifiable economic and sustainability benefits. In addition, the management of company assets and resources remains important because company scale has been shown to play a role in shaping market valuation.

Future research is recommended to extend the observation period and sector coverage and to consider other variables such as profitability, leverage, company growth, capital structure, company risk, and governance. The measurement of ESG Disclosure, CSR Disclosure, and Green Investment can also be developed using more specific indicators to more comprehensively capture disclosure quality and the characteristics of sustainability investment.

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