

ESG DISCLOSURE, GREEN INVESTMENT, SUSTAINABILITY REPORTING QUALITY, AND FIRM VALUE: THE MODERATING ROLE OF FIRM SIZE IN INDONESIAN ENERGY COMPANIES

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Abstract

This study examines the effect of Environmental, Social, and Governance (ESG) disclosure, green investment, and sustainability reporting quality on firm value, with firm size as a moderating variable in energy sector companies listed on the Indonesia Stock Exchange in 2024. The study employed a quantitative associative approach using secondary data obtained from annual reports, sustainability reports, and financial statements. Purposive sampling produced 65 observations that met the research criteria. Data were analyzed using Moderated Regression Analysis (MRA), supported by classical assumption tests and hypothesis testing. The findings indicate that ESG disclosure does not significantly affect firm value. In contrast, green investment and sustainability reporting quality have positive and significant effects on firm value. Firm size also has a positive and significant direct effect on firm value. However, firm size does not moderate the relationship between ESG disclosure, green investment, or sustainability reporting quality and firm value. Simultaneously, ESG disclosure, green investment, and sustainability reporting quality significantly affect firm value. The first regression model explains 36.0% of the variation in firm value, while the moderation model explains 74.4%. These findings imply that energy sector companies should prioritize concrete green investment initiatives and improve the quality, completeness, and credibility of sustainability reporting to strengthen market value and stakeholder confidence.

Keywords: ESG disclosure, green investment, sustainability reporting quality, firm size, firm value.

1. INTRODUCTION

The development of sustainable investment has increased attention toward Environmental, Social, and Governance (ESG) aspects, green investment, and sustainability reporting in business activities. The Global Sustainable Investment Alliance reported that global sustainable investment amounted to USD 35.3 trillion in 2020 and USD 30.3 trillion in 2022, coinciding with increasing attention to climate change issues and demands for carbon emission reductions (GSIA, 2020; GSIA, 2023). In Indonesia, the commitment to reducing emissions was strengthened through the ratification of the Paris Agreement under Law Number 16 of 2016 and the Nationally Determined Contribution target of 31.89% through domestic efforts or 43.20% with international support by 2030 (Ministry of Environment and Forestry, 2023). At the same time, investors have increasingly considered sustainability information in investment decision-making, as indicated by an Ernst & Young survey reporting that 99% of global investors consider corporate ESG disclosure in their investment decisions (Ernst & Young, 2022).

The energy sector is one of the sectors receiving significant attention in the sustainability agenda because its operational activities are associated with various environmental impacts. Data from the Ministry of Forestry show that Indonesia's net deforestation reached 175,400 hectares in 2024, increasing from 121,100 hectares in 2023, with mining activities being one of the contributing factors to this condition (Ministry of Forestry, 2025). In line with the development of sustainability regulations, energy sector companies listed on the Indonesia Stock Exchange are also required to disclose ESG information, allocate green investments, and publish sustainability reports in accordance with the sustainable finance provisions established by the Financial Services Authority (OJK, 2021). This study focuses on energy sector companies listed on the Indonesia Stock Exchange in 2024 because the sector demonstrates substantial variation in sustainability practices and market valuation.

Data from energy sector companies in 2024 show substantial differences in firm value, measured using market capitalization. These differences are reflected in stock price variations ranging from IDR 5 to IDR 37,000 per share and differences in the number of outstanding shares among companies (Indonesia Stock Exchange, 2024). On the other hand, the level of ESG disclosure also shows considerable variation, ranging from 3 to 23 indicators out of the 24 indicators used. Similar variation is evident in green investment, with disclosure ranging from 1 to 7 indicators out of a total of 10 indicators, as well as sustainability reporting quality, which ranges from 1 to 77 indicators based on the GRI G4 standards (Indonesia Stock Exchange, 2024). These conditions indicate differences in sustainability characteristics among companies operating in the same sector.

The phenomenon of variation in firm value and sustainability practices is relevant to examine because it occurs alongside increasing investor attention toward non-financial information. ESG disclosure is viewed as a means of communicating information regarding a company's environmental, social, and governance aspects to stakeholders (Adhi & Cahyonowati, 2023). Green investment reflects the allocation of corporate resources to activities related to environmental objectives and sustainability (Zhang & Berhe, 2022). Furthermore, sustainability reporting quality is associated with the completeness, accuracy, and credibility of information disclosed by companies to stakeholders (Trihatmoko et al., 2020). Given the variation in sustainability practices and market capitalization within the energy sector, the relationship among these variables remains a topic requiring further empirical examination.

Previous studies have shown inconsistent findings regarding the relationship between sustainability practices and firm value. Anggarista et al. (2024) found that ESG disclosure significantly affects the firm value of energy sector companies, whereas Arofah & Khomsiyah (2023) found that ESG has no effect on firm value. Regarding green investment, Mentari & Dewi (2023) reported a positive effect on firm value, while Agatha & Aryati (2024) reported different findings. Mixed results were also found regarding sustainability reporting quality, in which Kamaluddin et al. (2024) found a significant positive effect on firm value, whereas Lisa & Susanti (2024) reported that sustainability reporting has no effect on firm value. In addition, Prayogo et al. (2023) showed that firm size may serve as a moderating variable in the relationship between ESG disclosure and firm value.

Based on this empirical gap, this study incorporates ESG disclosure, green investment, and sustainability reporting quality into an integrated research model involving energy sector companies listed on the Indonesia Stock Exchange in 2024. This study also includes firm size as a moderating variable, measured using the company's total assets, as applied by Prayogo et al. (2023) and Permatasari & Mutmainah (2019). This study differs from previous research, which generally examined each sustainability variable separately or used different research objects. Therefore, this study provides empirical evidence regarding the relationship between these three sustainability aspects and firm value in the energy sector.

Based on the preceding explanation, this study aims to analyze the effects of Environmental, Social, and Governance (ESG) disclosure, green investment, and sustainability reporting quality on firm value in energy sector companies listed on the Indonesia Stock Exchange. This study also aims to examine the role of firm size as a moderating variable in the relationship between ESG disclosure, green investment, sustainability reporting quality, and firm value.

2. RESEARCH METHOD

This study employed a quantitative approach with an associative research design to analyze the effects of Environmental, Social, and Governance (ESG) disclosure, green investment, and sustainability reporting quality on firm value, with firm size as a moderating variable. The data consisted of secondary data obtained from annual reports, sustainability reports, and financial statements of energy sector companies listed on the Indonesia Stock Exchange (IDX). The research sample was determined using purposive sampling, resulting in 65 observations that met the research criteria.

The variables used in this study consist of one dependent variable, three independent variables, one moderating variable and Firm Value serves as the dependent variable. ESG Disclosure is the first independent variable (X_1). Green Investment is the second independent variable (X_2). Sustainability Reporting Quality is the third independent variable (X_3), Firm Size serves as the moderating variable (Z) and Firm Value serves as the dependent variable (Y).

Data analysis was conducted using IBM SPSS Statistics through several testing stages. The classical assumption tests included a normality test using the Kolmogorov-Smirnov method, a multicollinearity test based on Tolerance and Variance Inflation Factor (VIF) values, a heteroscedasticity test using the Glejser method, an autocorrelation test using the Runs Test, and a linearity test using the Lagrange Multiplier method. The regression model was considered linear when the calculated χ^2 value was lower than the critical χ^2 value (Ghozali, 2021).

Hypothesis testing was conducted using Moderated Regression Analysis (MRA), which is an extension of multiple linear regression involving interaction variables to examine the effects of independent variables on a dependent variable while considering the role of a moderating variable. Furthermore, model evaluation was performed through correlation coefficient analysis (R), coefficient of determination analysis (R^2), simultaneous testing (F -test), and partial testing (t -test) at a 5% significance level (Ghozali, 2021).

3. RESULTS AND DISCUSSION

3.1 Classical Assumption Test

3.1.1 Normality Test

The normality test was conducted to determine whether the residual data in the regression model were normally distributed. The test used the Kolmogorov-Smirnov (K-S) method, with the criterion that an Asymp. Sig. (2-tailed) value greater than 0.05 indicates normally distributed residuals, whereas an Asymp. Sig. (2-tailed) value lower than 0.05 indicates non-normally distributed residuals. The normality test results are presented in Table 1.

Table 1. Normality Test Results

Test	Value
N (Sample)	65
Test Statistic	.116
Asymp.Sig.(2-tailed)	.322

Source: Processed Data, 2026

Based on the normality test results in Table 1, the Asymp. Sig. (2-tailed) value is 0.322 (> 0.05). Therefore, the residuals in the research model are normally distributed.

3.1.2 Multicollinearity Test

The multicollinearity test was conducted to determine whether correlations existed among the independent variables in the regression model. A good regression model should not exhibit multicollinearity. The testing criteria are a Tolerance value greater than 0.10 and a VIF value below 10, indicating the absence of multicollinearity. The multicollinearity test results obtained through SPSS are presented in Table 2.

Table 2. Multicollinearity Test Results

Model	Collinearity Statistics	
	Tolerance	VIF
ESG Disclosure (X1)	0.412	2.429
Green Investment (X2)	0.428	2.337
Sustainability Reporting Quality (X3)	0.356	2.805
Firm Size (Z)	0.182	5.484
X1 * Firm Size	0.211	4.746
X2 * Firm Size	0.221	4.534
X3 * Firm Size	0.236	4.237

Source: Processed Data, 2026

Based on Table 2, all variables have Tolerance values above 0.10 and VIF values below 10. Therefore, it can be concluded that the regression model does not experience multicollinearity and is suitable for further analysis.

3.1.3 Heteroscedasticity Test

The heteroscedasticity test was conducted to determine whether there were differences in residual variance across observations in the regression model. The test used the Glejser method, with a significance value greater than 0.05 indicating the absence of heteroscedasticity. The heteroscedasticity test results are presented in Table 3.

Table 3. Heteroscedasticity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4.617	5.413		-0.854	0.397
	ESG Disclosure (X1)	0.025	0.091	0.091	0.273	0.786
	Green Investment (X2)	0.022	0.089	0.064	0.244	0.808
	Sustainability Reporting Quality (X3)	3.549	6.461	0.208	0.549	0.585
	Firm Size (Z)	0.194	0.191	0.548	1.013	0.315
	X1*Firm Size	-0.001	0.003	-0.158	-0.242	0.810
	X2 * Firm Size	-0.001	0.003	-0.093	-0.264	0.793
	X3* Firm Size	-0.131	0.228	-0.374	-0.576	0.567

Source: Processed Data, 2026

Based on the test results in Table 3, all variables have significance values above 0.05. Therefore, it can be concluded that the regression model does not experience heteroscedasticity and meets the assumptions for further analysis.

3.1.4 Autocorrelation Test

The autocorrelation test was conducted to determine whether correlations existed among residuals in a regression model. The autocorrelation test results are presented in Table 4.

Table 4. Autocorrelation Test Results

Test	Value
Test Valuea	-0.07520
Z	0.377
Asymp. Sig. (2-tailed)	.706

Source: Processed Data, 2026

Based on the autocorrelation test results in Table 4, which were obtained using the Runs Test, the regression model is considered free from autocorrelation when the Asymp. Sig. (2-tailed) value is greater than 0.05.

3.1.5 Linearity Test

The linearity test was conducted to assess the suitability of the regression model specification. The test used the Lagrange Multiplier method, with the criterion that the model is considered linear when the calculated χ^2 value is lower than the critical χ^2 value (Ghozali, 2021). The test results are presented in Table 5.

Table 5. Linearity Test Results

Model Summary				
Description	n	Auxiliary R ²	Calculated χ^2 (n × R ²)	Critical χ^2 (df = 3, $\alpha = 0.05$)
X1, X2, X3, Z, X1*Z, X2*Z, X3*Z	65	0.062	4.030	7.815

Source: Processed Data, 2026

Based on Table 5, the calculated χ^2 value is 4.030, which is lower than the critical χ^2 value of 7.815. Therefore, the regression model is considered linear, and the model specification involving Firm Size as a moderating variable is appropriate.

3.2 Hypothesis Test

3.2.1 Multiple Linear Regression Analysis

This study employed Moderated Regression Analysis (MRA), which is an extension of multiple linear regression involving interaction variables. MRA was used to examine the effects of independent variables on the dependent variable by considering the role of a moderating variable that may strengthen or weaken the relationship. The analysis was conducted using two regression equations. The results of the first regression equation are presented in Table 6.

Table 6. Multiple Linear Regression Analysis Results (I)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	25.239	0.897		28.129	0.000
ESG Disclosure (X1)	0.019	0.013	0.197	1.515	0.135
Green Investment (X2)	0.032	0.016	0.225	2.040	0.046
Sustainability Reporting Quality (X3)	2.712	0.867	0.407	3.129	0.003

Dependent Variable: Firm Value.

Source: Processed Data, 2026

Based on the results presented in Table 6, the regression equation is as follows:

$$Y = 25.239 + 0.019X_1 + 0.032X_2 + 2.712X_3 + e$$

The interpretation of the equation is as follows:

1. The constant value of 25.239 indicates that Firm Value is 25.239 when ESG Disclosure, Green Investment, and Sustainability Reporting Quality are equal to zero.
2. ESG Disclosure (X_1) has a positive coefficient of 0.019, meaning that every one-unit increase in ESG Disclosure will increase Firm Value by 0.019.
3. Green Investment (X_2) has a positive coefficient of 0.032, meaning that every one-unit increase in Green Investment will increase Firm Value by 0.032.
4. Sustainability Reporting Quality (X_3) has a positive coefficient of 2.712, indicating that every one-unit increase in this variable will increase Firm Value by 2.712.

The results of the MRA for the second equation are presented in Table 7.

Table 7. Multiple Linear Regression Analysis Results (II)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.677	10.177		0.067	0.947
Firm Size (Z)	0.958	0.360	0.897	2.666	0.010
X1*Firm Size	0.002	0.006	0.156	0.321	0.749
X2*Firm Size	0.002	0.006	0.176	0.294	0.770
X3*Firm Size	-0.304	0.429	-0.549	-0.710	0.481

Dependent Variable: Firm Value.

Source: Processed Data, 2026

Based on the results in Table 7, the moderation regression equation is as follows:

$$Y = 0.677 + 0.958 Z + 0.002X_1*Z + 0.002X_2*Z - 0.304X_3*Z$$

The interpretation of the equation is as follows:

1. The constant value of 0.677 indicates that Firm Value is 0.677 when all independent and moderating variables are equal to zero.
2. Firm Size (Z) has a positive regression coefficient of 0.958. This coefficient indicates that every one-unit increase in Firm Size increases Firm Value by 0.958 units, assuming the other variables remain constant.
3. The interaction term ($X_1 * Z$) has a positive regression coefficient of 0.002. However, the significance value of 0.749 is greater than 0.05. These results indicate that the interaction between ESG Disclosure and Firm Size does not significantly affect Firm Value. Therefore, Firm Size is not proven to strengthen or weaken the effect of ESG Disclosure on Firm Value.
4. The interaction term ($X_2 * Z$) has a positive regression coefficient of 0.002. However, the significance value of 0.770 is greater than 0.05. This means that the interaction between Green Investment and Firm Size does not significantly affect Firm Value. Therefore, Firm Size is not proven to strengthen or weaken the effect of Green Investment on Firm Value.
5. The interaction term ($X_3 * Z$) has a negative regression coefficient of -0.304. However, the significance value of 0.481 is greater than 0.05. This indicates that the interaction between Sustainability Reporting Quality and Firm Size does not significantly affect Firm Value. Therefore, Firm Size is not proven to weaken or strengthen the effect of Sustainability Reporting Quality on Firm Value.

3.2.2 Correlation Coefficient Analysis (R)

Correlation analysis aims to determine the magnitude and direction of the relationship between the independent variables and the dependent variable. The correlation coefficient test results are presented in Table 8.

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

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.600	0.360	0.329	1.75399
Predictors: (Constant), X3, X2, X1.				
Dependent Variable: Firm Value.				

Source: Processed Data, 2026

Based on Table 8, the correlation coefficient (R) is 0.600. This value indicates a strong relationship between ESG Disclosure, Green Investment, Sustainability Reporting Quality, and Firm Value, based on the correlation coefficient criteria ranging from 0.60 to 0.799.

The results of the second equation are presented in Table 9.

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

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863	0.744	0.712	1.14783
Predictors: (Constant), X3*Firm Size, X2*Firm Size, X1*Firm Size, Firm Size, X1, X2, X3.				
Dependent Variable: Firm Value.				

Source: Processed Data, 2026

Based on Table 9, the correlation coefficient (R) is 0.863. This value indicates a very strong relationship between all variables, including the interaction terms with Firm Size as a moderating variable, and Firm Value because it falls within the range of 0.80–1.000.

3.2.3 Coefficient of Determination

The coefficient of determination is used to measure the ability of the independent variables to explain variations in the dependent variable. This study used the Adjusted R^2 value because it provides a more accurate estimate of the model's explanatory ability. Based on Table 8, the first model has an R^2 value of 0.360, indicating that ESG Disclosure, Green Investment, and Sustainability Reporting Quality explain 36.0% of the variation in Firm Value, while the remaining 64.0% is influenced by other factors outside the model. Based on Table 9, the second model has an R^2 value of 0.744, meaning that the independent variables together with Firm Size as a moderating variable explain 74.4% of the variation in Firm Value, while the remaining 25.6% is explained by other factors. The increase in the R^2 value indicates that Firm Size improves the model's ability to explain Firm Value.

3.2.4 Simultaneous Test (F Test)

The F-test was used to examine the simultaneous effect of the independent variables on the dependent variable. The testing decision was based on a significance value below 0.05 or a calculated F-value greater than the critical F-value, indicating that the independent variables simultaneously have a significant effect on the dependent variable. The simultaneous test results obtained using SPSS are presented in Table 10.

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

Model	Sum of Squares	Mean Square	F	Significance
Regression	105.586	35.195	11.440	.000
Residual	187.665	3.077		

Dependent Variable: Firm Value.

Source: Processed Data, 2026

Based on the test results in Table 10, the significance value is 0.000 (< 0.05), with a calculated F-value of 11.440. These results indicate that ESG Disclosure, Green Investment, and Sustainability Reporting Quality simultaneously have a significant effect on Firm Value.

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

Model	Sum of Squares	Mean Square	F	Significance
Regression	218.152	31.164	23.654	.000
Residual	75.098	1.318		

Dependent Variable: Firm Value.

Predictors: (Constant), X3*Firm Size, X2 * Firm Size, X1* Firm Size, Firm Size, X1, X2, X3

Source: Processed Data, 2026

Based on Table 11, the significance value is 0.000 (< 0.05), with a calculated F-value of 23.654. These results indicate that the second regression model involving Firm Size as a moderating variable is significant overall.

3.2.5 Partial Test (t Test)

The t-test was used to examine the partial effect of each independent variable on the dependent variable. The testing decision was based on a significance value below 0.05 or a calculated t-value greater than the critical t-value, indicating a significant partial effect. The partial test results obtained using SPSS are presented in Table 12.

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

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	25.239	0.897		28.129	0.000
ESG Disclosure (X1)	0.019	0.013	0.197	1.515	0.135
Green Investment (X2)	0.032	0.016	0.225	2.040	0.046
Sustainability Reporting Quality (X3)	2.712	0.867	0.407	3.129	0.003

Dependent Variable: Firm Value.

Source: Processed Data, 2026

Based on Table 12, with a critical t-value of 2.000, the t-test results can be explained as follows:

1. ESG Disclosure (X₁) has a significance value of 0.135 (> 0.05) and a calculated t-value of 1.515 (< 2.000). This indicates that ESG Disclosure does not have a significant effect on Firm Value.
2. Green Investment (X₂) has a significance value of 0.046 (< 0.05) and a calculated t-value of 2.040 (> 2.000). Thus, Green Investment has a positive and significant effect on Firm Value.
3. Sustainability Reporting Quality (X₃) has a significance value of 0.003 (< 0.05) and a calculated t-value of 3.129 (> 2.000). These results indicate that Sustainability Reporting Quality has a positive and significant effect on Firm Value.

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

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.677	10.177		0.067	0.947
Firm Size (Z)	0.958	0.360	0.897	2.666	0.010
X1*Firm Size	0.002	0.006	0.156	0.321	0.749
X2*Firm Size	0.002	0.006	0.176	0.294	0.770
X3*Firm Size	-0.304	0.429	-0.549	-0.710	0.481

Dependent Variable: Firm Value.

Source: Processed Data, 2026

Based on Table 13, with a critical t-value of 2.002, the moderation test results indicate the following:

1. Firm Size (Z) has a significance value of 0.010, which is lower than 0.05, and a calculated t-value of 2.666, which is greater than the critical t-value of 2.002. These results indicate that Firm Size has a positive and significant effect on Firm Value, as reflected by its positive regression coefficient of 0.958.
2. The X₁*Z interaction has a significance value of 0.749 (> 0.05) and a calculated t-value of 0.321 (< 2.002). This indicates that Firm Size does not moderate the relationship between ESG Disclosure and Firm Value.

3. The X_2*Z interaction has a significance value of 0.770 (> 0.05) and a calculated t-value of 0.294 (< 2.002). Therefore, Firm Size does not moderate the relationship between Green Investment and Firm Value.
4. The X_3*Z interaction has a significance value of 0.481 (> 0.05) and a calculated t-value of -0.710 (< 2.002). These results indicate that Firm Size does not moderate the relationship between Sustainability Reporting Quality and Firm Value.

3.3 DISCUSSION

The Effect of ESG Disclosure on Firm Value

The partial test results indicate that ESG Disclosure does not have a significant effect on Firm Value. This is indicated by a calculated t-value of 1.515, which is lower than the critical t-value of 2.000, and a significance value of 0.135, which is greater than 0.05. Therefore, the hypothesis stating that ESG Disclosure affects Firm Value is rejected. The regression coefficient for ESG Disclosure is 0.019, indicating a positive direction of the relationship. However, the effect is not statistically significant, meaning that an increase in ESG Disclosure has not been able to substantially increase Firm Value among the energy sector companies included in this study. These findings indicate that the ESG information disclosed by companies has not become a primary consideration for investors in valuing companies. This result differs from the findings of Nasution et al. (2024) and Manulang and Soeratin (2024), who found that ESG Disclosure has a positive and significant effect on Firm Value.

The Effect of Green Investment on Firm Value

The partial test results indicate that Green Investment has a positive and significant effect on Firm Value. These results are shown by a calculated t-value of 2.040, which is greater than the critical t-value of 2.000, and a significance value of 0.046, which is lower than 0.05. Therefore, the hypothesis stating that Green Investment affects Firm Value is accepted. The regression coefficient of 0.032 indicates that an increase in Green Investment is followed by an increase in Firm Value. This finding indicates that investment activities oriented toward environmental sustainability receive a positive response from the market, thereby increasing firm value. This result supports the study by Nurjannah et al. (2025), which found that Green Investment has a positive and significant effect on Firm Value. However, these results contradict the studies of Larasati et al. (2024) and Agatha and Aryati (2024), which found that Green Investment does not significantly affect Firm Value.

The Effect of Sustainability Reporting Quality on Firm Value

The test results indicate that Sustainability Reporting Quality has a positive and significant effect on Firm Value. This is evidenced by a calculated t-value of 3.129, which is greater than the critical t-value of 2.000, and a significance value of 0.003, which is lower than 0.05. Therefore, the hypothesis stating that Sustainability Reporting Quality affects Firm Value is accepted. The regression coefficient of 2.712 indicates that the better the quality of sustainability reporting presented by the company, the higher its Firm Value. These findings indicate that high-quality sustainability information can increase stakeholder confidence and provide a positive signal regarding the company's performance. These

results are consistent with the study by Seprina et al. (2023), which concluded that Sustainability Reporting Quality has a positive and significant effect on Firm Value.

The Role of Firm Size in Moderating the Effect of ESG Disclosure on Firm Value

The moderation test results indicate that Firm Size is unable to moderate the effect of ESG Disclosure on Firm Value. This is indicated by a significance value of 0.749, which is greater than 0.05, and a calculated t-value of 0.321, which is lower than the critical t-value of 2.002. Therefore, the proposed moderation hypothesis is rejected. The interaction coefficient of 0.002 indicates a positive direction of the relationship; however, the effect is not significant. These findings indicate that the size of a company does not affect the relationship between ESG Disclosure and Firm Value. These findings are consistent with the studies of Ashari (2025) and Kristina et al. (2026), which stated that Firm Size is unable to moderate the effect of ESG Disclosure on Firm Value.

The Role of Firm Size in Moderating the Effect of Green Investment on Firm Value

The test results indicate that Firm Size is unable to moderate the effect of Green Investment on Firm Value. This is shown by a significance value of 0.770, which is greater than 0.05, and a calculated t-value of 0.294, which is lower than the critical t-value of 2.002. Therefore, the proposed hypothesis is rejected. The interaction coefficient between Green Investment and Firm Size is 0.002, indicating a positive direction of the relationship. However, because the effect is not statistically significant, Firm Size cannot be considered to strengthen or weaken the effect of Green Investment on Firm Value. These results support the study by Salim and Fathihani (2026), which stated that Firm Size is unable to moderate the effect of Green Investment on Firm Value. Thus, the relationship between Green Investment and Firm Value is not influenced by differences in company size.

The Role of Firm Size in Moderating the Effect of Sustainability Reporting Quality on Firm Value

The moderation test results indicate that Firm Size is unable to moderate the effect of Sustainability Reporting Quality on Firm Value. These results are indicated by a significance value of 0.481, which is greater than 0.05, and a calculated t-value of -0.710, which is lower than the critical t-value of 2.002. Therefore, the proposed hypothesis is rejected. The interaction coefficient of -0.304 indicates a negative direction of the relationship. However, because the effect is not significant, Firm Size cannot be concluded to weaken the effect of Sustainability Reporting Quality on Firm Value. These findings are consistent with the study by Triana and Simatupang (2025), which stated that Firm Size is unable to moderate the effect of Sustainability Reporting Quality on Firm Value. Thus, the relationship between the two variables is not influenced by differences in company size.

4. CONCLUSION

This study shows that ESG Disclosure, Green Investment, and Sustainability Reporting Quality simultaneously have a significant effect on Firm Value in energy sector companies listed on the Indonesia Stock Exchange. The partial test results indicate that ESG Disclosure does not significantly affect Firm Value, with a calculated t-value of 1.515, a

significance value of $0.135 > 0.05$, and a regression coefficient of 0.019. Green Investment has a positive and significant effect on Firm Value, with a calculated t-value of 2.040, a significance value of $0.046 < 0.05$, and a regression coefficient of 0.032. Sustainability Reporting Quality also has a positive and significant effect on Firm Value, with a calculated t-value of 3.129, a significance value of $0.003 < 0.05$, and a regression coefficient of 2.712. In the moderation model, the findings show that Firm Size is unable to moderate the effects of ESG Disclosure, Green Investment, and Sustainability Reporting Quality on Firm Value. This is indicated by the significance values of the interaction variables ESG Disclosure $\times$ Firm Size, Green Investment $\times$ Firm Size, and Sustainability Reporting Quality $\times$ Firm Size, which are 0.749, 0.770, and 0.481, respectively, all exceeding 0.05. Therefore, Firm Size does not serve as a moderating variable in the relationship between the three independent variables and Firm Value.

The simultaneous test results show that, in Model I, ESG Disclosure, Green Investment, and Sustainability Reporting Quality jointly have a significant effect on Firm Value, with a calculated F-value of 11.440 and a significance value of $0.000 < 0.05$. In Model II, which incorporates Firm Size and interaction variables, the calculated F-value is 23.654 with a significance value of $0.000 < 0.05$, indicating that all variables in the model simultaneously have a significant effect on Firm Value. The correlation coefficient in Model I is 0.600, indicating a strong relationship between the independent variables and Firm Value, whereas it increases to 0.863 in Model II, indicating a very strong relationship. In addition, the coefficient of determination increases from 36.0% in Model I to 74.4% in Model II. These results indicate that the inclusion of Firm Size and interaction variables improves the model's ability to explain variations in Firm Value.

Theoretically, this study enriches the literature regarding the effects of ESG Disclosure, Green Investment, and Sustainability Reporting Quality on Firm Value, as well as the role of Firm Size as a moderating variable. Practically, the findings may serve as a consideration for companies and investors in making decisions related to green investment and sustainability reporting to enhance firm value. This study is limited to ESG Disclosure, Green Investment, Sustainability Reporting Quality, and Firm Size. Therefore, future research is recommended to include other variables, such as profitability, corporate governance, capital structure, and macroeconomic factors, as well as extend the observation period and increase the sample size to obtain more comprehensive findings.

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