

## The Effect Of Green Accounting, And Environmental, Social, and Governance on Firm Value With Firm Size as a Moderating Variable

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### **Keywords:**

Green Accounting, ESG, Firm Value, Firm Size, Moderated Regression Analysis

### **Abstract**

*This study aims to empirically examine the effect of Green Accounting and Environmental, Social, and Governance (ESG) on Firm Value, with Firm Size as a moderating variable, in mining companies listed on the Indonesia Stock Exchange (IDX) for the 2021-2024 period. The population in this study was all mining companies listed on the IDX, with a sampling technique resulting in 32 observational samples. The data analysis method used was Moderated Regression Analysis (MRA) with the assistance of SPSS software. The results of the study indicate that Green Accounting does not have a significant effect on Firm Value with a significance value of 0.951. Conversely, ESG was found to have a positive effect on Firm Value at a significance level of 10% with a value of 0.080. Regarding the moderating role, Firm Size was unable to moderate the effect of Green Accounting on Firm Value (significance value of 0.965). However, Firm Size was proven to moderate the effect of ESG on Firm Value with a negative (weakening) relationship direction at a significance level of 10% (significance value of 0.085). The results of the analysis also show that Firm Size acts as a Quasi Moderator (Pseudo Moderator) in this research model. Simultaneously, this model has a significance value of 0.014 with the ability to explain variations in Firm Value of 26.4% (Adjusted R Square)*

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## INTRODUCTION

The Indonesian economy faces various global challenges in 2025, yet foreign investment continues to grow. Amidst this dynamic, companies are required to increase their corporate value to maintain shareholder and investor confidence. Corporate value is often influenced by both positive and negative signals. One way companies demonstrate their environmental responsibility is through the implementation of Green Accounting. Green Accounting is not simply a matter of recording costs, but rather a transparency tool for companies to disclose costs incurred related to managing the environmental impact of their operations. Investors are currently tending to be more cautious about investing in sectors with high environmental risks. Clear environmental accounting disclosures are expected to act as a positive signal (signaling theory) that can increase market confidence and ultimately increase corporate value.

In addition to environmental accounting, ESG (Environmental, Social, and Governance) indicators have become the global standard for investors to assess a company's non-financial performance. In the mining sector, a strong ESG score reflects a company's commitment to transparent governance and its commitment to social and ecological issues. Companies with comprehensive ESG disclosures are considered to have lower future legal and operational risks, making them more attractive to investors.

One example of a phenomenon that occurs as reported by [Kejati-jatim.go.id](http://Kejati-jatim.go.id), on January 2, 2025, The tin trade corruption scandal involving PT Timah resulted in state losses of hundreds of

trillions of rupiah and massive environmental damage. These cases highlight the importance of regulatory compliance and environmental management.

Achieving maximum corporate value is the primary goal of every business entity because it reflects shareholder welfare. However, the influence of environmental factors on corporate value often shows inconsistent results. Differences in economies of scale or firm size are suspected to be one factor influencing this relationship. Large companies in the mining sector generally have greater resources for environmental disclosure, but on the other hand, they also experience greater agency costs and public pressure than smaller companies. Therefore, firm size is positioned as a moderating variable to determine whether company scale can strengthen or weaken the influence of Green Accounting and ESG on corporate value.

The 2021-2024 research period was selected based on the dynamics of the mining sector post-COVID-19 pandemic and the increasing trend of green energy transition globally, which has a direct impact on fluctuations in mining commodity prices and stock prices on the Indonesia Stock Exchange (IDX). Against this backdrop, this study aims to empirically reexamine how Green Accounting and ESG practices affect company value, considering company size as a moderating factor in the Indonesian mining sector.

## Literature Review and Hypothesis Development

### Basic theory

A theory that can be applied to company value is Signaling Theory. Signaling theory was first introduced by Spence in his research entitled "Job Market Signaling." Spence (1973) in Nursanita (2019:157) suggests that a signal provides a signal. The sender (the owner of the information) attempts to provide relevant information that the recipient can utilize. The recipient will then adjust their behavior according to their understanding of the signal.

Signaling theory refers to signals given by company management to investors as an indication of the company's prospects (Brigham and Houston, 2014:184). Signaling theory proposes how a company should convey signals to users of financial statements. These signals take the form of information about what management has done to fulfill the owner's wishes. Signals can take the form of promotions or other information that suggests the company is performing better than other companies. Meanwhile, according to Brigham and Houston (2014:184), signaling theory is a company management's attitude in providing investors with clues regarding management's views on the company's future prospects.

Positive signals shared by a company will encourage investors to invest by purchasing its shares. The more investors invest in a company, the higher the volume of its stock trading. This will ultimately lead to an increase in the company's stock market price and value.

### Company Values

Companies can grow and develop, in part, because of investors. However, it's important to note that not all investors are willing to invest in a company. Investors consider several factors before deciding to invest in a company. Company value is one of the key considerations investors make when deciding to invest in a company. Corporate value is a company's strength that reflects its position to external parties. These external parties can range from stakeholders, the general public, economic observers, to potential investors.

The method of measuring company value in this study uses Tobin's Q.

$$Q = \frac{MVE + \text{Book Value of Liabilities}}{\text{Book Value of Total Asset}}$$

Information :

Q: Company Values

MVE : Market Value of Equity

Book Value of Liabilities: Book value of Debt

Book Value of Total Assets: Total book value of assets

### **Green Accounting**

Based on the opinion of Cohen and Robbins (2011) (In Medina, 2022), green accounting or environmental accounting is defined as: "A style of accounting that includes the indirect costs and benefits of economic activity such as environmental effects and plans" which means environmental accounting is a type of accounting that includes the indirect costs and benefits of economic activities, such as the environmental and health impacts of business planning and decisions. Meanwhile, according to Lako (2018) (In Medina, 2022) explains that green accounting is as follows:

"A process of recognition, measurement of value, recording, summarizing, reporting, and disclosure in an integrated manner of financial, social, and environmental objects, transactions, or events in the accounting process in order to produce complete, integrated, and relevant financial, social, and environmental accounting information that is useful for users in making economic and non-economic decisions and management." (Medina et. al. (2022).

The implementation of green accounting in a company will have a positive impact on the environment, with the main focus being presenting or including environmental cost accounts in the company's financial statements for environmental preservation, as cited by Zulkhairi in Saputra (2023). Disclosure of environmental information through green accounting provides a positive signal to investors and stakeholders that the company has a responsible and sustainable business strategy that aligns with signaling theory. Companies that provide positive signals and have a good reputation will certainly gain trust, increase company value, and attract investor interest.

Research conducted by Felicia Zaneta, et al. in 2023, although more specific, their research shows that Green product innovation and environmental management accounting have a significant positive effect on company value; Also, research by Citra Sukmadilaga, et al. shows that the implementation of Green Accounting reports with an emission dimension has a significant effect with a significance level of 10% with a positive direction on the creation of EVA from companies included in the Asia Sustainability Reporting List Awards.

H1: Green Accounting can influence company value

### ***Environment, Social, Governmentt (ESG)***

The ESG score reflects good corporate governance. Good corporate governance can increase corporate value, reflected in rising stock prices, because investors assume a significant portion of corporate profits will be returned to investors in the form of dividends (Jensen & Meckling, 1976; Yasa, 2022). Investor interest in companies with strong ESG scores is high because companies with good ESG scores demonstrate good performance, risk management, and corporate behavior. The transparency and future prospects of companies with good ESG scores increase corporate value and investor confidence in investing.

This is reflected in research conducted by Vita Aprilina et al. (2023), which shows that ESG influences company value.

H2: ESG can influence company value

### **Firm Size**

According to Brigham & Houston (2011:4) Firm Size is the scale of a company's size that can be classified based on various methods, including revenue, total assets, and total equity. Firm Size is a scale of size seen from the total assets of a company or organization that combines and organizes various resources with the aim of producing goods or services for sale.

Firm size, which is based on total assets, is generally based on managers' assumption that companies with large total assets are relatively stable and capable of generating substantial profits. Larger companies have a broader stakeholder base, so their policies will have a greater impact on the public interest than smaller companies. For investors, company policies will impact future cash flow prospects. For regulators, they will impact the amount of tax collected and the effectiveness of their role in providing protection to the public in general.

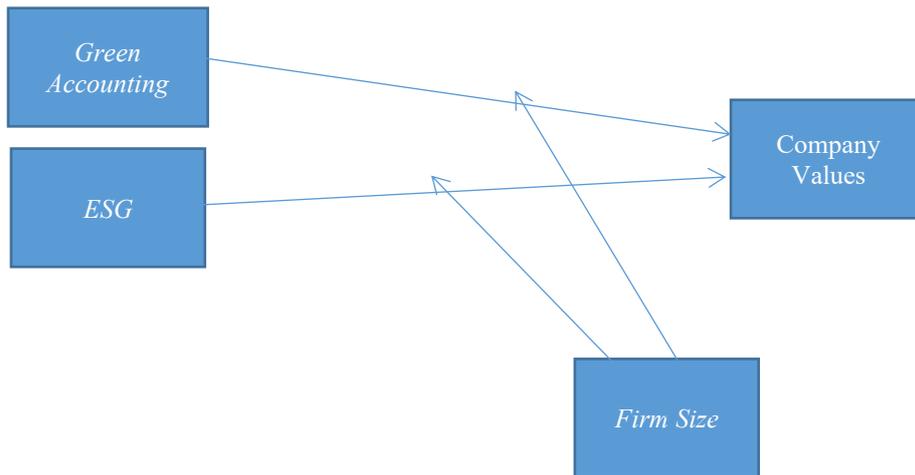
According to Harahap (2022), firm size is measured by the natural logarithm (Ln) of a company's average total assets. The use of total assets is based on the consideration that total assets reflect firm size and are thought to influence timeliness. The description above shows that firm size is determined by asset size. This asset size is measured as the logarithm of total assets.

In a 2023 study by Enny Prayogo et al., which discussed the influence of ESG disclosure on company value, with firm size as a moderator, it was concluded that firm size can moderate ESG disclosure and retention ratio on company value.

H3: Firm Size moderates the influence of Green Accounting on firm value

H4: Firm Size moderates the effect of ESG on firm value

**Research Model**



## METHODS

This study uses a quantitative approach to mining sector companies listed on the IDX for the 2021-2024 period. The population in this study is all mining companies on the IDX, with a purposive sampling technique with the sample criteria in this study, namely:

- Mining sector companies listed on the Indonesia Stock Exchange for the 2021-2024 period,
- Companies that publish financial reports and annual reports during the 2021-2024 period on the IDX website or the company's official website,
- Publish Environmental, Social, & Governance (ESG) performance in the annual report or sustainability report.
- Mining sector companies whose reports are in Rupiah currency

which resulted in 32 observation samples. Data were analyzed using SPSS software with the Moderated Regression Analysis (MRA) method. Green Accounting is measured by the ratio of environmental management costs to net income, ESG uses the disclosure score of environmental, social, and governance aspects, Firm Value is measured by Tobin's Q, and Firm Size is measured by total assets

## RESULTS AND DISCUSSION

### Table 1. Descriptive Statistical Analysis

Descriptive statistical analysis is a research method used to describe or explain a phenomenon or object in detail. The following are the results of the descriptive statistical test for this study:

Table 1. Results of Descriptive Statistical Tests

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Standard Deviation
(X1) GA	32	-7.88	-1.94	-4.6758	1.33045
(X2) ESG	32	-1.58	-.03	-.5861	.41122
FZ	32	3.25	3.45	3.3590	.05932

NP	32	-.84	2.62	.5267	.78005
Interaction1 (X1xZ)	32	-4.61	1.39	-1.3189	1.34178
Interaction2 (X2xZ)	32	1.74	3.41	2.7729	.45624
Valid N (listwise)	32				

Source: SPSS Output

Based on the descriptive statistics presented in table 1 above, this study with the variables GA (Green Accounting), ESG (Environmental, Social, Government) as independent variables, and FZ (Firm Size) as a moderating variable, and NP (Company Value) as a dependent variable, from 32 research objects, shows:

- The Firm Value (NP) variable in this study using the Tobins'Q ratio has an average value (mean) of 0.5267 with a standard deviation of 0.78005, a minimum value of -0.84, and a maximum value of 2.62; So the standard deviation value  $>$  mean is  $0.78005 > 0.5267$ , a standard deviation value greater than the average which means that the data has a high level of data distribution, so that the research variables are heterogeneous and the average does not represent the entire data.
- The Green Accounting (GA) variable in this study uses the ratio of environmental management costs to net profit with an average value (mean) of -4.6758 with a standard deviation of 1.33045, a minimum value of -7.88 and a maximum value of -1.94; The negative average value indicates that in general the net profit of the companies in the sample is negative so that the ratio becomes negative. The standard deviation value  $<$  mean (in absolute terms) is  $1.33045 < 4.6758$ , a standard deviation value smaller than the average value (in absolute terms) indicates that the data has a low level of distribution and is relatively homogeneous, so that the average is sufficient to represent the condition of the data.
- The Environmental, Social, Government (ESG) variable in this study using the GRI standard has an average value (mean) of -0.5861 with a standard deviation of 0.41122, a minimum value of -1.58, and a maximum value of -0.03; A negative average value indicates that the company's ESG disclosure level tends to be low. The standard deviation value  $<$  mean (in absolute terms) is  $0.41122 < 0.5861$ , a standard deviation value smaller than the average value (in absolute

terms) indicates that the data has a low level of distribution and is relatively homogeneous, so that the average sufficiently represents the condition of the data.

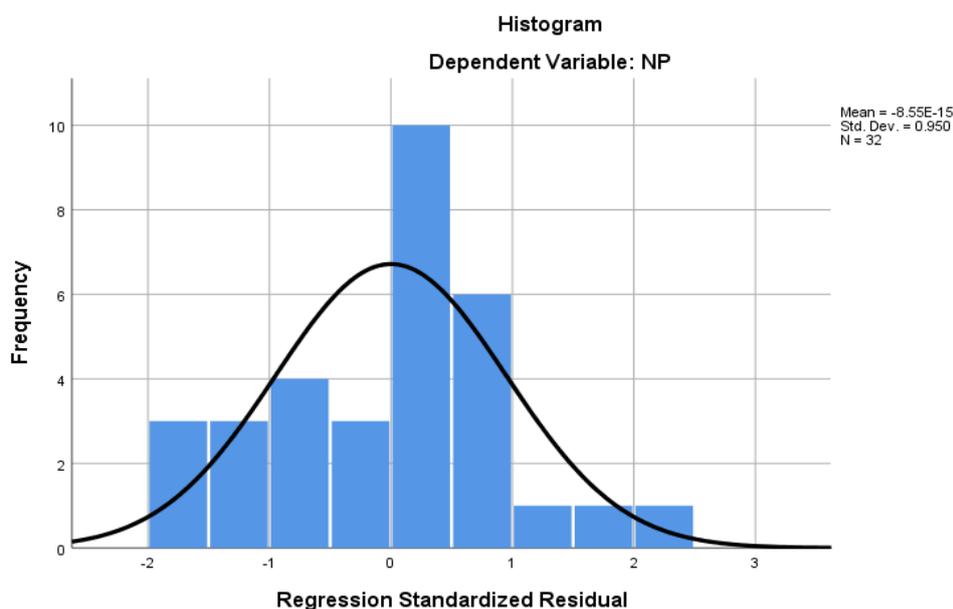
- The Firm Size (FZ) moderating variable in this study has an average (mean) of 3.3590 with a standard deviation of 0.05932, a minimum value of 3.25 and a maximum value of 3.45; The standard deviation value  $<$  mean is  $0.05932 < 3.3590$ , a standard deviation value that is much smaller than the average indicates that the data has a very low or relatively homogeneous level of distribution, and the average is sufficient to represent the condition of the data.
- Interaction1 is the result of multiplying the independent variable X1 (Green Accounting) with the moderating variable Z (Firm Size), with an average value (mean) of -1.3189, with a standard deviation of 1.34178. The standard deviation value  $>$  mean,  $1.34178 > -1.3189$ , indicates that the data has a high level of data distribution, so that the interaction effect between variables in the research sample varies.
- Interaction2 is the result of multiplying the independent variable X2 (ESG) with the moderating variable Z (Firm Size) with an average value (mean) of 2.7729, with a standard deviation of 0.45624. The standard deviation value  $<$  mean,  $0.45624 < 2.7729$ , indicates that the data has a low or homogeneous level of data distribution, so that the interaction effect between variables in the research sample is relatively uniform.

## Classical Assumption Test

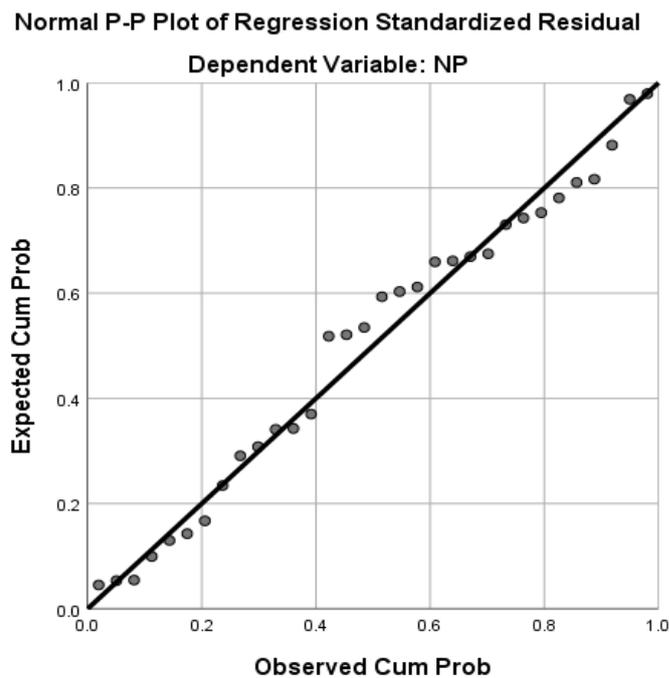
### Normality Test

The normality test is used to test whether a regression model, dependent and independent variables or both have a normal distribution or not.

Figure 1 Histogram Graph



**Figure 2 P-Plot Graph**



The P-Plot graph in Figure 4.2 above shows that the resulting regression model distribution tends to be normal. This is evident from the evenly distributed points that lie close to the diagonal line.

**Table 7 Results of the One Sample Kolmogorov-Smirnov test**

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		32
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Standard Deviation	.62519282
Most Extreme Differences	Absolute	.113

	Positive	.077
	Negative	-.113
Test Statistics		.113
Asymp. Sig. (2-tailed)		.200c,d

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

The results of the One Sample Kolmogorov-Smirnov test show an Asymp.Sig value of 0.200, indicating that the figure is greater than 0.05. Thus, it can be concluded that the variable is normally distributed.

### Multicollinearity Test

**Table 8 Multicollinearity Test Results**

Coefficients<sup>a</sup>

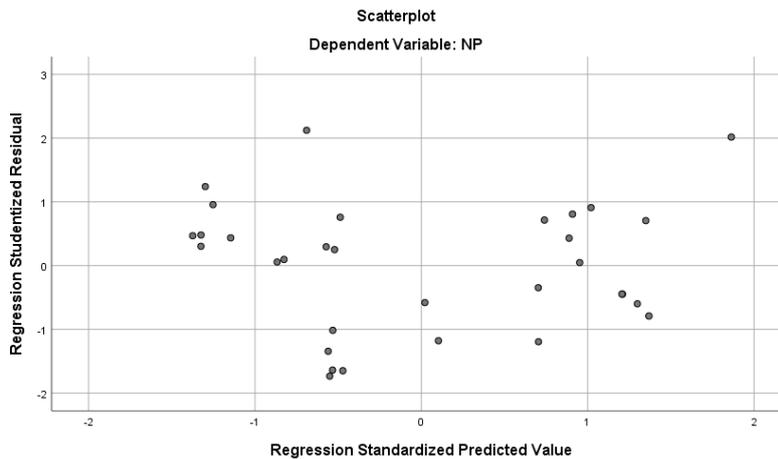
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	34,077	10,178		3,348	.002		
	GA	.075	.093	.127	.804	.428	.915	1,093
	ESG	.564	.438	.297	1,287	.208	.430	2,325
	FZ	-9,786	3,002	-.744	-3,260	.003	.440	2,272

a. Dependent Variable: NP

Based on table 4.8 above, it can be seen that the Tolerance value > 0.10 or VIF value < 10, so it can be concluded that there is no multicollinearity.

### Heteroscedasticity Test

**Figure 3 Heteroscedasticity Test Results**



Based on the scatterplot results shown in Figure 4.3 above, it can be observed that the points displayed do not form a specific pattern. Therefore, it can be concluded that there is no case of heteroscedasticity in this study. The following are the test results using the Glejser statistical test:

**Table 9 Glejser Test Results**

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2,777	5,662		-.490	.628
	GA	.018	.052	.069	.357	.724
	ESG	-.285	.244	-.328	-1,171	.251
	FZ	.953	1,670	.158	.570	.573

a. Dependent Variable: Abs\_UT

Based on the results of the Glejser test shown in Table 4.9 above, it is clearly shown that all independent variables have a significance value greater than 0.05: GA 0.724 > 0.05, ESG 0.251 > 0.05, and FZ 0.573 > 0.05. Thus, it can be concluded that the regression model does not experience heteroscedasticity.

**Table 10 Auto-correlation Test Results**

Model Summary

Model	R	R Square	Adjusted Square	Standard Error of the Estimate	Durbin-Watson
1	.598a	.358	.289	.65783	1,922

a. Predictors: (Constant), FZ, GA, ESG

b. Dependent Variable: NP

Based on the results of the autocorrelation test in table 4.10 above, the Durbin-Watson value obtained was 1.922 which was in the range of 1.5-2.5, so it can be concluded that the regression model did not experience autocorrelation.

Thus, this model has passed the test or meets the requirements for linear regression analysis.

### Hypothesis Testing

#### Moderated Regression Analysis (MRA)

MRA is a regression analysis method used to test whether a moderating variable strengthens or weakens the relationship between the independent variable and the dependent variable.

**Table 11. F Test Results**

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,775	4	1,694	3,783	.014b
	Residual	12,088	27	.448		
	Total	18,863	31			

a. Dependent Variable: NP

b. Predictors: (Constant), Interaction2, GA, ESG, Interaction1

Based on the F-test results in Table 4.11 above, the significance value is 0.014. Since  $0.014 < 0.05$ , this regression model is suitable for use, and the independent variables collectively influence firm value (NP).

**Table 12 Results of the Determination Coefficient (R2) Test**

#### Model Summary

Model	R	R Square	Adjusted Square	Standard Error of the Estimate
1	.599a	.359	.264	.66911

a. Predictors: (Constant), Interaction2, GA, ESG, Interaction1

b. Dependent Variable: NP

Based on the results of the determination coefficient test in table 4.12 above, it can be seen that the Adjusted R Square value is 0.264, which indicates that the independent variables Green Accounting, ESG and its moderation Firm Size are able to explain the variation in Company Value by 26.4%, while the rest is influenced by other factors outside this research model.

**Table 13 T-Test Results**

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	34,135	10,438		3,270	.003
	GA	.253	4,037	.431	.063	.951
	ESG	10,190	5,607	.5372	1,817	.080
	Interaction1	-.176	3,996	-.304	-.044	.965
	Interactions	-9,624	5,381	-.5629	-1,789	.085
2						

a. Dependent Variable: NP

Based on table 13 above, the regression equation formed is as follows:

$$NP = 34.135 + 0.253 GA + 10.190 ESG - 0.176 Interaction1 - 9.624 Interaction2$$

Meanwhile, based on the Sig. value of the significance test results, it can be concluded that:

- The independent variable Green Accounting (GA) with a Sig. value of 0.951 > 0.05, means that Green Accounting does not have a significant effect on company value.
- The independent variable Environment, Social, Government (ESG) with a Sig. value of 0.080 at the 10% level has a positive effect on company value. Although the ESG significance value of 0.080 is above the alpha of 0.05, it remains significant at alpha of 0.10. This indicates a tendency for ESG to have a positive effect on company value in the mining sector on the IDX. The use of this 10% level is commonly used in social research with a limited number of samples (N = 32) to avoid Type II Error (failure to detect the actual effect).
- Interaction 1 in the table illustrates the relationship between the independent variable Green Accounting and the moderating variable Firm Size (GA\*FZ). Interaction 1 has a Sig. value of 0.965, which means it is not significant, and it can be concluded that Firm Size does not moderate Green Accounting on Firm Value.

- The interactions in the table illustrate the relationship between the independent variable Environment, Social, Government (ESG) and the moderating variable Firm Size (ESG\*FZ). The interaction has a significance value of 0.085. At the 10% level, it can be concluded that Firm Size moderates the relationship between ESG and Firm Value in a negative direction (weakening).

## **Discussion**

### **The Impact of Green Accounting on Company Value in the Mining Sector for the 2021-2024 Period**

Based on the t-test results, the Green Accounting variable has a regression coefficient of 0.253 with a significance level of 0.951. Since the significance value is greater than 0.05, it can be concluded that Green Accounting has no effect on Firm Value in mining sector companies listed on the IDX for the 2021-2024 period. Therefore, H1 is rejected.

The results of this study contradict the research conducted by Felicia Zaneta, et al. in 2023, although more specific, but their research shows that Green product innovation and environmental management accounting have a significant positive effect on company value; Also, research by Citra Sukmadilaga, et al. shows that the implementation of Green Accounting reports with an emission dimension has a significant effect with a significance level of 10% with a positive direction on the creation of EVA from companies included in the Asia Sustainability Reporting List Awards.

These findings indicate that for mining companies, costs allocated to environmental management are not yet considered a determining factor in company value by investors. This is likely because environmental cost disclosure in the mining sector is still viewed as a normative (mandatory) obligation to comply with government regulations, thus not having a significant positive impact or impact on stock prices in the capital market.

### **The Impact of ESG on Company Value in the Mining Sector for the 2021-2024 Period**

The results show that the ESG variable has a positive regression coefficient of 10.190 with a significance level of 0.080. At a 10% significance level, this result indicates that ESG has a positive effect on firm value in mining sector companies listed on the IDX for the 2021-2024 period. Therefore, H2 is accepted.

The results of this study align with research conducted by Vita Aprilina et al. (2023), which showed that ESG influences company value.

These findings indicate that investors in the mining sector are beginning to recognize the importance of environmental, social, and governance aspects. Mining companies with good ESG scores are perceived as having lower future operational and legal risks, thus providing shareholders with confidence that the company will maintain its long-term business sustainability.

### **The Role of Firm Size in Moderating the Effect of Green Accounting on Firm Value**

The MRA test results for Interaction variable 1 showed a significance value of 0.965 ( $>0.05$ ). This means that Firm Size is unable to moderate the effect of Green Accounting on Firm Value in the mining sector. Therefore, H3 is rejected.

The size of a mining company's assets (company size) does not change investor perceptions of its environmental accounting practices. Investors tend to view environmental policies as a standard set by the mining industry, regardless of the scale of the company's asset capacity.

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

Interaction Variable 2 shows a negative coefficient of -9.624 with a significance value of 0.085. At the 10% level, this indicates that Firm Size moderates (weakens) the positive effect of ESG on Firm Value. Therefore, H4 is accepted.

This negative correlation indicates that in mining companies with very large asset sizes, ESG disclosure does not have as strong an impact on increasing company value as in smaller companies. This is likely because large mining companies tend to face greater public scrutiny and agency costs, distorting the effectiveness of ESG disclosure in increasing company value due to their large operational costs and already high market expectations.

The results of this study align with research conducted by Enny Prayogo et al. in 2023, which discussed the influence of ESG disclosure on company value, with firm size as a moderating factor. Their study concluded that firm size can moderate ESG disclosure and retention ratio on company value.

### **Moderation Type Analysis: Quasi Moderator**

Based on the comparison of test results, the Firm Size (FZ) variable independently has a significant influence on Company Value with a Sig.  $0.003 < 0.05$ . When tested in an interaction model, Interaction 2 also shows significant results at the 10% level (Sig. 0.085).

Therefore, in the context of mining companies on the IDX 2021-2024, firm size is categorized as a quasi-moderator. This means that company size not only serves as a variable that weakens the relationship between ESG and firm value but is also an independent variable that directly determines the value of a mining company

## CONCLUSION

Based on the results of data analysis and discussions conducted on mining sector companies listed on the Indonesia Stock Exchange (IDX) for the 2021-2024 period, the following conclusions can be drawn:

Green Accounting has no significant effect on Company Value in the mining sector. This indicates that the level of environmental cost allocation reported by companies is not yet a primary indicator for investors in determining the value of mining companies in the capital market. (H1 rejected)

ESG (Environmental, Social, and Governance) has a positive effect on Company Value at the 10% significance level. This indicates that investors in the mining sector are beginning to appreciate corporate transparency in environmental, social, and good governance management as a guarantee of business sustainability. (H2 is accepted)

Firm size is unable to moderate the effect of green accounting on firm value. The size of a mining company's assets does not strengthen or weaken market perceptions of environmental accounting implementation. (H3 rejected)

Firm size moderates the effect of ESG on firm value negatively (weakening) at the 10% significance level. The larger the mining company, the less positive the effect of ESG disclosure on firm value increases. (H4 is accepted)

Moderation Type: The Firm Size variable in this study is categorized as a Quasi-Moderator. This is because Firm Size has a significant direct influence on Firm Value while also interacting with the independent ESG variable.

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