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The Impact of Carbon Emission Disclosure, Debt to Equity Ratio, and Institutional Ownership on Firm Value: Environmental Accountability and Corporate Governance Perspectives

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ABSTRACT

Purpose of the study: This study aims to examine how carbon emission disclosure, debt to equity ratio, and institutional ownership affect a company's value, evaluated using price to book value, for companies listed on the Indonesia Stock Exchange up to the years 2021-2024.

Methodology: The method used in this research is quantitative. The data sources come from annual reports, sustainability reports, and each company. The sample was taken using purposive sampling, which was then analyzed using multiple linear regression through SPSS version 25, supported by descriptive statistics and classical assumption tests.

Main Findings: The results show that carbon emission disclosure and institutional ownership do not have significant effects on firm value, while the Debt to Equity Ratio has a positive and significant effect. Although carbon disclosure does not directly influence market valuation, it remains an important instrument for environmental transparency and corporate accountability. Similarly, institutional ownership highlights the need to strengthen monitoring effectiveness and governance practices beyond ownership concentration. These findings emphasize the importance of integrating financial performance, environmental responsibility, and corporate governance in mining companies..

Novelty/Originality of this study: This study integrates carbon emission disclosure, debt to equity ratio, and institutional ownership into a single analysis model for Indonesian mining companies using the latest data from 2021–2024. Unlike previous studies that only tested one or two variables or used old data, this study includes debt to equity ratio as an independent predictor, adding insights into the factors that determine the value of companies in the mining sector.

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1. INTRODUCTION

The mining industry plays an important role in supporting Indonesia's economic development. This sector contributes to national foreign exchange earnings, creates employment opportunities, and provides essential raw materials for domestic and international industries [1], [2]. Indonesia produced approximately 54% of the world's total nickel in 2023, with production projected to increase to 60% by 2028. In addition, Indonesia ranks among the major global copper producers, highlighting the strategic position of its mining industry in international

commodity markets [3], [4]. Beyond its economic contribution, mining activities also have significant social implications because they influence employment conditions, community livelihoods, public welfare, and the development of areas surrounding operational sites [5], [6].

Despite its substantial economic contribution, the mining industry faces increasing challenges related to environmental sustainability, social responsibility, and corporate governance [7], [8]. Mining operations are closely connected to the interests of various stakeholders, including local communities who may experience changes in their living conditions and surrounding environments, workers who depend on safe working conditions and employment security, governments responsible for regulating natural resource management, and investors concerned with corporate sustainability and long-term business prospects. Mining activities can generate economic opportunities while simultaneously creating environmental pressures that affect the quality of life of communities around operational areas [9], [10]. Consequently, mining companies are expected to demonstrate transparency, environmental accountability, and responsible governance in managing their operational impacts [11], [12]. In this context, investors increasingly consider environmental, social, and governance factors alongside financial performance when making investment decisions. Therefore, firm value, commonly measured through the price to book value ratio, should also be understood within the broader context of corporate accountability and stakeholder interests [13], [14].

The main focus of this primary objective is the decline in asset value per share in several of these studies, particularly in the mining sector and listed on the Indonesia stock exchange during the 2021-2024 period. Book Value per share serves as a fundamental indicator that reflects the total net assets of a company after liabilities are subtracted, allocated to each share unit [15], [16]. A recurring decline in assets per share indicates a drop in the company's equity, which could be caused by accumulated losses, increased debt, or dividend practices that exceed net profits [17], [18]. This situation sends a bad signal to investors and can potentially reduce the overall value of the company.

One factor that is considered to influence firm value is carbon emission disclosure. Beyond providing information for investment decisions, carbon emission disclosure represents an important form of environmental transparency and corporate accountability [19], [20]. It involves reporting quantitative and qualitative information about the carbon emissions generated by a company's operational activities through annual reports or sustainability reports. Through this disclosure, companies communicate the environmental consequences of their operations and demonstrate their responsibility for managing the environmental impacts of business activities [21], [22]. From a stakeholder theory perspective, carbon emission disclosure reflects a company's accountability not only to shareholders but also to local communities, governments, employees, and other stakeholders affected by its operations. Transparent environmental reporting enables stakeholders to assess corporate environmental responsibility, monitor sustainability commitments, and evaluate the extent to which companies address the environmental consequences of their activities [23], [24]. Therefore, carbon emission disclosure serves both as an instrument of environmental accountability and as information that may shape stakeholder perceptions and market evaluations of a company [25], [26]. However, empirical findings remain inconsistent. Carbon emission disclosure does not have a significant effect on firm value among mining companies in Indonesia, suggesting that environmental transparency does not necessarily translate directly into higher market valuation.

The second variable of interest in this study is the funding structure, analyzed through the comparison between debt and equity. The debt to equity ratio is used as a tool to assess the ratio between a company's total financial liabilities and its total share capital, and it plays an important role for investors in evaluating a company's financial risk profile [27], [28]. Companies with a high debt to equity ratio tend to face high interest costs, which can lead to a decrease in net profit and potentially lower the company's valuation [29], [30]. Therefore, analyzing the debt to equity ratio is really important, especially in the context of increased capital expenditures that often occur in the mining sector [31], [32]. The third factor discussed is institutional ownership, which means the percentage of shares held by financial institutions like banks, insurance companies, pension funds, and investment managers. Having institutional shareholders in a company's ownership structure is considered an effective way to control the board of directors [33], [34]. Institutional ownership has a significant positive impact on a company's value. This happens because institutional ownership can improve operational efficiency and create order within management.

Although carbon emission disclosure, financial structure, and institutional ownership have been individually examined in previous studies, their relationships with environmental accountability, corporate governance, and market-based firm valuation remain important areas for further investigation, particularly in the mining industry. From a social science perspective, mining companies are not merely economic entities but also organizations whose operational activities affect environmental sustainability and the interests of various stakeholders [7], [35]. Therefore, understanding firm value requires considering not only financial indicators but also how companies demonstrate environmental responsibility through carbon emission disclosure and implement corporate governance mechanisms through institutional ownership [26], [36]. Environmental transparency provides stakeholders with information about the environmental consequences of corporate operations, while institutional ownership represents a potential monitoring mechanism for ensuring managerial accountability [23], [37]. However, these dimensions do not necessarily translate directly into higher market valuation, particularly

when investors continue to prioritize financial considerations. Previous research shown that integrated carbon emission disclosure, green accounting, and institutional ownership in examining firm value, but did not incorporate the Debt to Equity Ratio as an independent predictor [38], [39]. This creates an opportunity to examine how environmental accountability, corporate governance, and financial structure collectively relate to the market valuation of mining companies. Accordingly, this study addresses this research gap by analyzing the effects of Carbon Emission Disclosure, Debt to Equity Ratio, and institutional ownership on the firm value of mining companies listed on the Indonesia Stock Exchange during the 2021–2024 period.

The novelty of this study lies in its integrated examination of Carbon Emission Disclosure, Debt to Equity Ratio, and institutional ownership as determinants of firm value in Indonesian mining companies. Unlike previous studies that have examined these factors separately or combined only some of them, this study incorporates environmental accountability, financial structure, and corporate governance within a single analytical framework using data from 2021 to 2024. The urgency of this research stems from the need to understand how mining companies' environmental transparency and governance mechanisms relate to market assessments of corporate value, particularly in an industry associated with substantial economic contributions and environmental and social consequences. Examining these relationships is important because firm value should not be viewed solely through financial performance but also in relation to corporate responsibility and accountability to stakeholders. Accordingly, this study aims to examine the individual and simultaneous effects of Carbon Emission Disclosure, Debt to Equity Ratio, and institutional ownership on the firm value of mining companies listed on the Indonesia Stock Exchange during the 2021–2024 period.

2. THEORITICAL REVIEW

2.1. Stakeholder Theory

Stakeholder theory serves as a suitable theoretical framework to describe the interaction between corporate information disclosure and company evaluation [40], [41]. Introduced by Freeman in 1984, this theory suggests that companies should not only focus on shareholder profits but also consider the interests of various parties affected by their operational activities, such as employees, creditors, public authorities, consumers, and the broader community. In relation to this study, stakeholder theory provides clarification on why companies need to disclose environmental information, including carbon emissions, not just to comply with legal requirements but also as a form of accountability to their stakeholders.

Furthermore, stakeholder theory explains that increasing transparency and accountability in information disclosure will strengthen stakeholders' trust in a business entity. This, in the end, will have a positive impact on the company's valuation in the capital market. companies that implement environmental accounting practices and consistently report their environmental performance manage to boost investor confidence and attract more investment.

2.2. Company Value

The value of a company reflects how investors assess the success of a business entity, usually related to the price of securities on the stock exchange. Company value is investors' view of how successful a company is, which is reflected in its stock price. When the stock price keeps rising, the company's value in the eyes of investors also increases. Company value is the amount investors or potential buyers are willing to pay if the company were sold. In other words, a company's value can reflect the market's confidence in its performance and future business prospects. From a scientific perspective, a company's value can be assessed through various approaches, one of which is the price to book value, which examines the difference between the market price of a stock and its book value.

Price to book value is calculated as: market price per share/book value per share. When price to book value shows a number above one, it means the market thinks the company’s value is higher than its book value, which reflects investors’ confidence in the company’s growth prospects and ability to generate profits. On the other hand, if price to book value is below one, it indicates that the market values the company at no more than its book value, which is often associated with weak financial performance or high risks faced by the company.

A company's value is influenced by many factors, both from within and outside the organization. Internal factors include the ability to generate profits, financing structure, company management, and the quality of earnings [42], [43]. On the other hand, external factors include the overall economic situation, existing regulations, and market reactions. In the context of the mining industry in Indonesia, changes in raw material prices also play an important role in a company's value.

2.3. Carbon Emission Disclosure

Carbon emission disclosure as an external factor refers to the activities of reporting that provide both quantitative and qualitative information about how much carbon emissions are produced from a company's operational activities, which can be done through annual reports or sustainability reports. Carbon emission

disclosure is a form of transparency implemented by companies as a response to their environmental obligations toward stakeholders [19], [20]. Carbon emission reporting is information provided by companies on the calculation of CO_2 (carbon dioxide) emissions with the aim of reducing carbon consumption during operational activities. Therefore, carbon emission reporting not only functions as a way to convey environmental information but also as a form of company accountability for the impact of its operations on the environment.

In the context of stakeholder theory, consistently and thoroughly disclosing carbon emissions shows a company's commitment to environmental sustainability. This is believed to boost the trust of investors who care about environmental, social, and governance factors, potentially increasing the company's value. Various studies support this view. Reporting carbon emissions positively affects company value because investors see this information as a sign of the company's commitment to sustainability. Carbon emissions disclosure provides accurate data for investors during the investment decision-making process.

Their findings show that carbon emission disclosure does not have a significant impact on company value. This is suspected to be because investors in the mining sector tend to pay more attention to traditional financial indicators, like commodity prices and company financial performance. Additionally, Indonesia's carbon emission reporting standards are not fully standardized, making the disclosed information hard to compare across companies and less effective as a signal for investors. The differences in these research results serve as a basis for refining the hypothesis in this study.

H1: Carbon Emission Disclosure has a positive impact on company value.

2.4. Debt to Equity Ratio

The debt to equity ratio is a tool used to assess the comparison between a company's total liabilities and its total equity. This ratio serves as an important measure in evaluating a company's capital structure and indicates how much the company relies on external financing. Debt to equity ratio is a ratio designed to analyze debt in relation to equity. This ratio functions to reveal how much borrowed funds are compared to the funds coming from the company's owners, and it shows all the company's own capital used as collateral for debt. Debt to equity ratio is a ratio that measures the proportion of debt in the context of the company's capital and is used to measure the financial contribution provided by creditors in funding the company's activities [44], [45]. Therefore, debt to equity ratio can be used as a tool to evaluate a company's ability to manage its funding structure and the financial risk it faces.

According to stakeholder theory, companies need to pay attention to the interests of various parties, including investors and creditors. Effective debt management can help meet the company's funding needs while also building stakeholders' trust in the company's future potential. Companies in the mining sector generally carry out operations that require large capital and have long investment cycles, so they often rely on debt to fund expansion or operational activities. A high debt to equity ratio in this industry doesn't always reflect poor financial conditions. However, excessive use of debt can still increase the risk of default and raise concerns among investors, potentially lowering the company's value. On the other hand, using debt can also offer benefits like a tax shield through interest expenses that can be deducted from the taxes owed. This advantage can improve funding efficiency for the company and help increase the company's value. Therefore, the higher the debt to equity ratio that is still within reasonable limits and can be managed effectively, the greater the company's opportunity to increase its value.

H2: Debt to Equity Ratio (DER) has a positive effect on the company's value.

2.5. Institutional Ownership

Institutional ownership refers to the percentage of a company's shares that come from various types of entities, including insurance companies, banks, pension funds, investment firms, and other financial institutions. Institutional ownership is a way for institutions or legal entities with significant authority and capacity to invest in and monitor a company's performance. Institutional investors act as external stockholders who focus on oversight to ensure that management's decisions align with shareholders' goals [46], [47]. Therefore, the presence of institutional investors can serve as an effective control mechanism to reduce opportunistic actions by management.

The presence of institutional investors in a company's ownership structure aligns with stakeholder theory, which emphasizes that those who have enough power and resources can have a bigger impact on the company's policies and decisions. Institutional investors, because of their relatively large ownership stakes, are strongly motivated to monitor management performance. They tend to have better analytical skills, access to more extensive information, and can support the implementation of more efficient corporate governance.

This situation pushes management to operate more effectively, minimize conflicts of interest between managers and investors, and optimize the quality of the company's decision-making. In the end, monitoring carried out by institutional owners can improve the company's performance and contribute to maximizing the company's value. Institutional ownership has a positive and significant impact on firm value. This finding suggests that active

oversight from institutional investors can reduce agency costs and encourage management to make decisions focused on long-term value creation. A positive influence of institutional ownership on firm value in Indonesia.

H3: Institutional ownership has a positive effect on firm value.

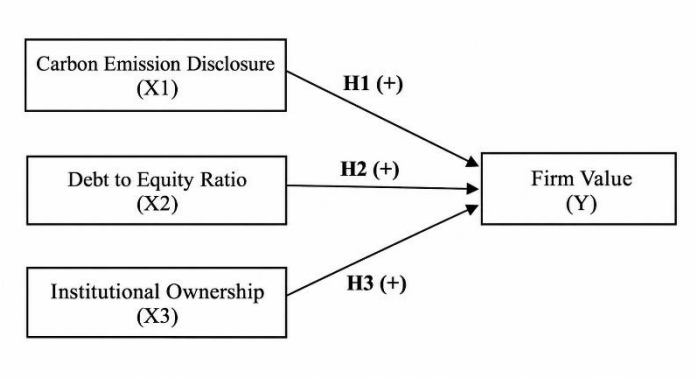

Figure 1. Research Framework

3. RESEARCH METHOD

3.1. Research Strategy and Design

This study employs a quantitative approach with a causal-associative research design to examine the effects of carbon emission disclosure, debt to equity ratio, and institutional ownership as independent variables on firm value as the dependent variable [48], [49]. The study uses secondary data collected from the annual reports, financial statements, and sustainability reports of mining companies listed on the Indonesia stock exchange during the 2021–2024 period. These documents serve as sources of information for identifying corporate disclosure practices, environmental accountability, financial characteristics, and corporate governance structures. Specifically, sustainability reports and relevant sections of annual reports are used to obtain information on carbon emission disclosure practices, while annual reports provide information on institutional ownership and corporate governance characteristics. Financial statements are used to obtain the financial data required to calculate the Debt to Equity Ratio and firm value. By utilizing these corporate reports, the study examines how environmental transparency, financial structure, and ownership-related governance mechanisms are associated with the market value of mining companies.

3.2. Population and Sample

The population analyzed in this study includes all mining companies listed on the Indonesia stock exchange during the period from 2021 to 2024. The sampling method used is purposive sampling, which means determining samples based on specific criteria relevant to the purpose of this study. The criteria set for purposive sampling are as follows:

Table 1. Research Sample Criteria

No.	Sample Selection Criteria
1	Mining companies that were listed and active on the Indonesia stock exchange throughout the entire 2021–2024 research period
2	Companies that consistently and completely published annual reports and sustainability reports throughout the research period
3	Companies that experienced a decline in book value per share during the 2021–2024 research period, so that they relate to the research phenomenon

Based on the criteria that were set, several mining companies were selected to be sampled in this study. During the observation period of four years (2021-2024), the total number of observations was the result of multiplying the number of companies chosen as samples by the length of the four-year observation period. All data was obtained through the official Indonesia Stock Exchange portal (IDX.co.id) as well as the official websites of each company.

3.3. Data Analysis Techniques

The information results in this study were carried out through a series of organized steps. First, descriptive statistical analysis was conducted to show the characteristics of the data by referring to the mean, standard

deviation, lowest, and highest values of each variable [50]. Second, a series of classical assumption tests were implemented as requirements for using the multiple linear regression model, which included: (a) normality testing using the Kolmogorov-Smirnov Test; (b) multicollinearity testing to check Tolerance Values and VIF; and (c) heteroscedasticity testing. If all those assumptions are met, the next step is to carry out multiple linear regression analysis to see how the independent variables affect the dependent variable, both partially (t-test) and simultaneously (F-test). The regression formula used is:

$$Y = \alpha + \beta^1 X^1 + \beta^2 X^2 + \beta^3 X^3 + \varepsilon \ldots (1)$$

Where Y is the company value, α is a constant, β_1, β_2, β_3 are the regression coefficients for each independent variable, X_1 is carbon emission disclosure, X_2 is the Debt to Equity Ratio, X_3 is Institutional Ownership, and ε is the error term. Data analysis was done using SPSS 25.

3.4. Research Procedure

The research procedure consisted of several systematic stages. First, relevant literature was reviewed to establish the theoretical foundation and develop the research framework. Second, the population and sample were determined using the predetermined purposive sampling criteria. Third, secondary data were collected from annual reports, financial statements, and sustainability reports of the selected companies for the 2021–2024 period. Fourth, the data were identified, classified, and measured according to the research variables, namely Carbon Emission Disclosure, Debt to Equity Ratio, institutional ownership, and firm value. Finally, the collected data were analyzed using multiple linear regression with SPSS version 25 to examine the individual and simultaneous effects of the independent variables on firm value.

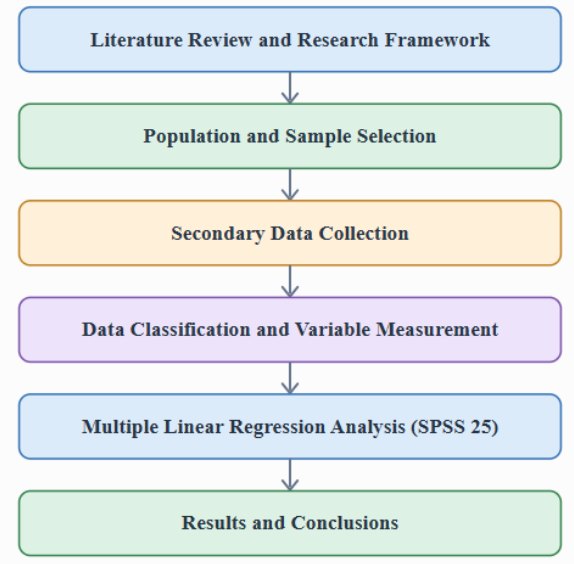

Figure 2. Research Procedure Flowchart

4. RESULTS AND DISCUSSION

Table 2. Results of Descriptive Statistical Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
X1	64	5.00	83.00	36.9375	22.89651
X2	64	2.00	1079.00	143.9688	214.87604
X3	64	5.00	99.00	64.9375	32.49414
Y	64	2.00	1233.00	189.7813	226.79572
Valid N (listwise)	64				

Table 2 presents the descriptive statistical results for the 64 observations included in this study. Carbon Emission Disclosure (X1) ranges from 5.00 to 83.00, with a mean of 36.9375 and a standard deviation of 22.89651. This variation indicates differences in the extent to which mining companies disclose information about their carbon emissions and environmental impacts. Some companies demonstrate more extensive carbon emission disclosure, while others provide relatively limited environmental information, reflecting differences in their transparency practices and environmental accountability. The Debt to Equity Ratio (X2) ranges from 2.00 to

1,079.00, with a mean of 143.9688 and a standard deviation of 214.87604, indicating substantial differences in the capital structures of the sampled companies. Institutional Ownership (X3) ranges from 5.00 to 99.00, with a mean of 64.9375 and a standard deviation of 32.49414. This variation reflects differences in ownership structures and the potential extent of institutional involvement in corporate monitoring and oversight. Companies with higher institutional ownership may have greater institutional participation in monitoring managerial decisions, although the effectiveness of such monitoring cannot be determined from ownership percentages alone. Meanwhile, Firm Value (Y) ranges from 2.00 to 1,233.00, with a mean of 189.7813 and a standard deviation of 226.79572, indicating considerable differences in market valuation among the sampled companies. Overall, the descriptive statistics reveal heterogeneous characteristics among mining companies, particularly in their environmental disclosure practices and institutional ownership structures.

Table 3. Results of Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	99.253	71.979		1.379	.173		
	X1	-.122	1.071	-.012	-.114	.910	.893	1.119
	X2	.641	.114	.607	5.612	.000	.893	1.120
	X3	.043	.715	.006	.060	.952	.997	1.003

a. Dependent Variable: Y

The regression results indicate that carbon emission disclosure has a negative but statistically insignificant effect on firm value, with a regression coefficient of -0.122, a t-value of -0.114, and a significance level of 0.910. Since the significance value exceeds 0.05, the hypothesis regarding the effect of carbon emission disclosure on firm value is not supported. This finding suggests that carbon emission disclosure does not have a statistically significant relationship with market valuation among the mining companies examined during the 2021–2024 period. However, this result should not be interpreted as evidence that environmental disclosure is unimportant. Carbon emission disclosure remains an essential instrument of environmental transparency and corporate accountability, enabling companies to communicate information about the environmental impacts of their operational activities to stakeholders, including investors, local communities, employees, and government institutions. Through transparent reporting, stakeholders can obtain information about corporate environmental responsibilities and assess the extent to which companies disclose their carbon-related activities. The absence of a statistically significant effect on firm value indicates only that the market valuation of the sampled companies was not significantly associated with the level of carbon emission disclosure during the observation period. Therefore, the environmental and accountability functions of carbon emission disclosure remain relevant, even when their relationship with firm value is not statistically demonstrated.

Table 4. Results of Heteroscedasticity Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	105.398	41.0082		2.566	.013
	X1	-.721	.611	-.134	-1.179	.243
	X2	.281	.065	.492	4.312	.599
	X3	.166	.408	.044	.407	.686

a. Dependent variable: ABRESID

Table 4 presents the results of the heteroscedasticity test using the Glejser method, with absolute residuals (ABRESID) as the dependent variable. The results show that Carbon Emission Disclosure (X1) has a significance value of 0.243, while Debt to Equity Ratio (X2) and institutional ownership (X3) have significance values of 0.599 and 0.686, respectively. All three independent variables have significance values greater than the 0.05 threshold. These results indicate that the independent variables do not have statistically significant effects on the absolute residuals. Therefore, based on the reported significance values, the regression model does not exhibit indications of heteroscedasticity and satisfies the homoscedasticity assumption.

Table 5. Results of Multiple Linear Regression Analysis Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.611[a]	.373	.342	183.99186

a. Predictors: (Constant), X3, X1, X2

Table 5 presents the results of the regression model summary. The coefficient of determination (R Square) is 0.373, indicating that Carbon Emission Disclosure, Debt to Equity Ratio, and institutional ownership collectively explain 37.3% of the variation in firm value. After adjusting for the number of independent variables, the Adjusted R Square is 0.342, meaning that the three independent variables account for 34.2% of the variation in firm value. The remaining 65.8% is associated with other factors outside the scope of this research and unexplained variation. Furthermore, the R value of 0.611 indicates the strength of the combined relationship between the independent variables and firm value. The standard error of the estimate is 183.99186, representing the standard deviation of the residuals in the regression model. Overall, these results indicate that the proposed regression model explains a portion of the variation in firm value, while other factors may also contribute to differences in the market valuation of mining companies.

Table 6. F Test Results

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1209306.597	3	403102.199	11.907	.000[b]
	Residual	2031180.341	60	33853.006		
	Total	3240486.938	63			

a. Dependent Variable: Y
b. Predictors: (Constant), X3, X1, X2

Table 6 presents the results of the simultaneous significance test (F-test) to examine whether Carbon Emission Disclosure, Debt to Equity Ratio, and institutional ownership jointly influence firm value. The results show an F-statistic of 11.907 with a significance value of 0.000 ($p < 0.001$), which is below the 0.05 significance threshold. Therefore, the regression model is statistically significant, indicating that the three independent variables collectively have a significant effect on firm value. These findings suggest that Carbon Emission Disclosure, financial structure, and institutional ownership, when considered simultaneously, contribute to explaining variations in the firm value of the sampled mining companies. Thus, the regression model is statistically suitable for examining the relationship between the independent variables and firm value.

The findings indicate that carbon emission disclosure does not have a statistically significant effect on firm value. From a social science perspective, this finding highlights the distinction between corporate environmental accountability and market-based assessments of organizational performance. Mining companies operate within a complex stakeholder environment in which their activities affect not only shareholders but also local communities, employees, governments, and the surrounding environment [51]. Consequently, carbon emission disclosure serves a broader purpose than communicating information for investment decisions. It represents a mechanism through which companies demonstrate transparency regarding the environmental consequences of their operational activities.

The absence of a significant relationship suggests that environmental disclosure has not necessarily become a decisive consideration in the market valuation of the sampled mining companies during the observation period. This may reflect differences in how investors interpret environmental information, the extent to which disclosure is incorporated into investment assessments, or the relative importance assigned to financial performance. However, the finding does not diminish the importance of environmental transparency. Disclosure remains relevant for strengthening corporate accountability, enabling stakeholder evaluation, and supporting public access to information about corporate environmental responsibilities [52]. Therefore, the contribution of carbon emission disclosure should not be assessed exclusively through its immediate relationship with firm value, but also through its role in promoting transparency and responsible corporate practices.

The positive and significant relationship between the Debt to Equity Ratio and firm value suggests that capital structure remains an important consideration in how mining companies are assessed by the market. Mining operations generally require substantial financial resources to support exploration, infrastructure development, equipment acquisition, and operational activities [53]. In this context, the use of debt may provide companies with additional financial capacity to maintain and expand their business operations. When debt is managed effectively, it may signal the company's ability to obtain external financing and pursue business opportunities, which can contribute positively to market perceptions.

From a social science perspective, financial decisions should also be understood in relation to organizational responsibility and stakeholder interests. A company's capital structure can influence its capacity to sustain employment, maintain operational continuity, fulfill contractual obligations, and contribute to the economic development of communities surrounding mining areas. Nevertheless, the positive relationship identified in this study should not be interpreted as evidence that increasing debt will always improve firm value or social welfare. Excessive financial obligations may create risks for business continuity and potentially affect

employees, business partners, and other stakeholders. Thus, the findings emphasize the importance of responsible financial management in balancing corporate growth, financial stability, and broader stakeholder interests.

The findings show that institutional ownership does not have a statistically significant effect on firm value. This suggests that the proportion of shares held by institutional investors does not necessarily translate into a stronger market valuation of mining companies. From a corporate governance perspective, institutional ownership is commonly associated with the potential for external monitoring because institutional investors may have the resources and capacity to evaluate managerial decisions. However, ownership concentration alone does not establish whether monitoring activities are actively performed or whether they effectively influence corporate policies and accountability.

In the context of social science, corporate governance involves more than the distribution of ownership. It also concerns the relationships between management, shareholders, employees, communities, regulators, and other stakeholders. The insignificant result may indicate that institutional participation, as represented by ownership percentages, is not sufficient to explain differences in market valuation within the observed sample. The effectiveness of governance may also depend on institutional investors' monitoring practices, their involvement in strategic decisions, and their attention to environmental and social responsibilities. Therefore, institutional ownership should be understood as a potential governance mechanism rather than direct evidence of effective oversight. The findings highlight the importance of examining the quality of monitoring and accountability practices, rather than relying solely on ownership composition.

The simultaneous significance of carbon emission disclosure, financial structure, and institutional ownership indicates that these dimensions collectively contribute to explaining variations in the firm value of mining companies. This finding supports the perspective that corporate valuation is associated with multiple organizational dimensions rather than a single financial indicator. Environmental disclosure represents the company's communication of environmental responsibility, financial structure reflects its capacity to manage resources and obligations, while institutional ownership represents a potential mechanism for monitoring managerial activities.

The findings are particularly relevant to the mining industry because corporate activities involve economic interests as well as environmental and social consequences. Companies are expected to maintain financial performance while responding to the expectations of investors, employees, local communities, and government institutions. These responsibilities require an understanding of corporate value that considers the interaction between economic performance, environmental transparency, and governance arrangements. Nevertheless, the significant joint effect does not mean that each dimension independently has a significant relationship with firm value. The individual contributions differ, as demonstrated by the partial regression results. This distinction is important because it shows that environmental accountability and corporate governance remain relevant dimensions of organizational analysis, even when their individual statistical relationships with market valuation are not established.

Overall, the findings provide insights into the relationship between corporate behavior, accountability, and market valuation in the mining sector. The results suggest that financial considerations remain closely associated with firm value, while environmental disclosure and institutional ownership do not demonstrate statistically significant individual relationships within the examined sample. However, this does not mean that environmental responsibility and corporate governance are less important than financial performance. Rather, it indicates that the market-based measurement of firm value does not necessarily capture the full contribution of corporate environmental and governance practices.

These findings have implications for corporate management and policymakers. Mining companies need to strengthen the quality and consistency of environmental reporting while ensuring that disclosed information is accessible and relevant to stakeholders. Regulators may also encourage more transparent and comparable environmental disclosure practices to support public accountability. Meanwhile, institutional investors should consider strengthening their monitoring roles by evaluating not only financial performance but also corporate environmental responsibilities and stakeholder-related risks. In this way, corporate accountability can be understood as a broader organizational responsibility that extends beyond market valuation and includes the interests of society and the environment.

5. CONCLUSION

This study examined the effects of Carbon Emission Disclosure, Debt to Equity Ratio, and institutional ownership on the firm value of mining companies listed on the Indonesia Stock Exchange during the 2021–2024 period. The findings indicate that Carbon Emission Disclosure and institutional ownership do not have significant individual effects on firm value, whereas the Debt to Equity Ratio has a positive and significant effect. Simultaneously, the three independent variables have a significant relationship with firm value. These results suggest that financial structure plays a more prominent role in market valuation than carbon emission disclosure and institutional ownership within the observed sample. Nevertheless, the absence of a significant effect on firm

value does not diminish the importance of environmental transparency and corporate governance in promoting corporate accountability. Mining companies should therefore strengthen environmental disclosure, improve governance practices, and maintain prudent financial management to address both economic objectives and stakeholder responsibilities. Future research may incorporate additional financial, environmental, and governance indicators to provide a more comprehensive understanding of the factors influencing firm value.

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