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Explaining How ESG Disclosure Creates Firm Value: The Mediating Role of Effective Tax Rate in Indonesian Mining Companies

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ABSTRACT

This study examines how Environmental, Social, and Governance (ESG) disclosure creates firm value through corporate tax behavior. The main issue addressed in this study is the limited understanding of the internal mechanism linking ESG disclosure to market valuation, particularly in Indonesia's mining sector. Using a quantitative explanatory approach, this study analyzes 115 firm-year observations from mining companies listed on the Indonesia Stock Exchange during the 2020–2024 period. Firm value is measured using Price to Book Value (PBV), corporate tax behavior is proxied by the Effective Tax Rate (ETR), and firm size is included as a control variable. Data are analyzed using Partial Least Squares path analysis, with the assessment focused on the structural model. The findings show that ESG disclosure has a positive effect on both ETR and PBV, while ETR positively affects PBV. The mediation test confirms that ETR mediates the relationship between ESG disclosure and firm value. These results suggest that companies with higher ESG disclosure tend to exhibit more responsible tax behavior, which contributes to higher firm value. This study concludes that corporate tax behavior serves as an important mechanism through which ESG disclosure contributes to firm value creation. The findings provide practical implications for managers, investors, and policymakers in promoting credible ESG disclosure and responsible corporate tax behavior.

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1. INTRODUCTION

Company value has become a central issue in capital market studies because it reflects how investors assess a firm's prospects, risks, and long-term performance quality. In market-based measurement, Price to Book Value (PBV) is used to indicate whether a company's stock price is trading at a premium or discount relative to its equity book value. This metric is relevant because the market does not assess only the assets recorded in accounting statements, but also expectations regarding cash flows, risks, reputation, and the sustainability of the business [1], [2], [3]. In the mining sector, the sensitivity of company value is evident in the pressure on Indonesian coal issuer stocks. Reuters reported that in 2025 Adaro shares fell by 18%, while Golden Energy Mines and Bukit Asam each lost more than one-tenth of their value, amid declining exports, demand

pressure, rising costs, and payment obligations to the government [4]. This phenomenon demonstrates that the value of mining companies is influenced not only by financial performance, but also by operational risks, commodity prices, regulations, and sustainability expectations.

These characteristics become increasingly prominent because the source of value for mining companies is determined not only by profit and mineral assets, but also by the company's ability to manage the social-ecological impacts of its operational activities. Mining operations are directly connected to the exploitation of natural resources, land clearing, emissions, waste, reclamation, occupational safety, and relations with surrounding communities. The literature shows that environmental and social issues in the mining industry are not merely matters of compliance, but also factors that influence the legitimacy of operations and the company's ongoing access to resources [5], [6]. [7] emphasize that mining can pose a threat to biodiversity, while [8] demonstrate that stakeholder support or conflict around a mine can affect the market's valuation of mining assets. Mining risk is therefore simultaneously financial, social, and ecological, meaning investors require non-financial information to assess the quality of a company's risk management.

This need for non-financial information positions Environmental, Social, and Governance (ESG) as a signal of company quality. ESG provides information about governance, transparency, environmental risk management, social relations, and a company's commitment to the sustainability of its operations. From a capital market perspective, ESG disclosure can reduce information asymmetry and help investors assess a company's risk and long-term prospects [9], [10]. Empirical evidence also shows that ESG disclosure is positively associated with company performance and investor response, especially when investors have a preference for sustainability issues [11]. For mining companies, ESG can serve as a signal that the company is capable of managing reputational risk, social conflict, and regulatory pressures that may impact market valuation.

However, the relationship between ESG and firm value is not yet fully stable in the literature. Some studies find that ESG can increase firm value because the market views ESG as information about risk, reputation, and the company's long-term prospects [2], [11]. Other evidence shows that the influence of ESG may differ depending on the proxy for firm value, observation period, sector, and market context. [3], for example, find that ESG positively affects firm value when measured by Tobin's Q and Price to Book, but is not significant when measured by Price to Earnings. [12] also show that the impact of ESG score on firm value became clearer after the pandemic. These differences in findings indicate that ESG is not always directly translated into higher market valuations. The relationship between ESG and firm value needs to be explained through internal mechanisms that show whether ESG commitment is reflected in company decisions.

One relevant internal mechanism is corporate tax behavior. Taxation is not only related to profit burden, but also reflects compliance, governance quality, fiscal risk, and corporate legitimacy. From the signaling theory perspective, ESG disclosure and tax behavior can serve as signals to investors in assessing transparency, reputational risk, and the quality of corporate governance [13], [14]. Effective Tax Rate (ETR), calculated from income tax expense divided by pre-tax income, is often used to capture the level of tax avoidance; a higher ETR generally indicates lower tax avoidance [15], [16]. Since aggressive tax practices can damage reputation and investor trust, ETR can be a mechanism that explains how ESG may potentially be translated into PBV.

The research gap emerges at the mechanistic level explaining the relationship between ESG and firm value. The ESG literature has extensively examined the direct effect of ESG on firm value, both through conceptual studies and cross-country empirical evidence [2], [3], [17]. In Indonesia, [18] show that ESG disclosure has a positive

effect on firm value, but have not yet explained whether this effect operates through corporate tax behavior. [19] position tax avoidance as an economic channel in the context of China, while [13], [20] emphasize the role of ESG as a moderator in the relationship between tax avoidance and firm value. This study addresses that gap by examining the effect of ESG on firm value through ETR as a mediating variable in mining sector companies in Indonesia. Theoretically, this study expands the ESG and firm value literature by positioning ETR as a mechanism of corporate tax behavior. Practically, this study helps investors interpret ESG and ETR as information on fiscal risk, reputation, and corporate governance quality. For regulators, this study provides input on the need to integrate ESG transparency and tax compliance to strengthen market confidence in the mining sector.

2. LITERATURE REVIEW

2.1 Theoritcal Foundation

The theoretical foundation of this research is based on the relationship between stakeholder pressure, the need for legitimacy, market signaling, and managerial behavior in explaining firm value. Stakeholder theory explains that companies need to respond to the interests of investors, government, employees, communities, regulators, and the environment, not just shareholders (Freeman, 1984). In the context of ESG, this perspective is relevant because stakeholder theory and legitimacy theory are widely used to explain sustainability disclosure and corporate responses to social pressure [21]. In the mining sector, ESG can be understood as both a response to stakeholder demands and a strategy for maintaining legitimacy, as company activities have significant social and ecological impacts [22].

This framework is reinforced by signaling theory and agency theory. Signaling theory explains that companies can send information to the market to reduce information asymmetry between management and investors [23]. In this study, ESG can serve as a signal of governance quality, transparency, and the company's ability to manage sustainability risks, while ETR can signal tax compliance and fiscal risk. Recent evidence shows that ESG disclosure can improve the market information environment and influence investor valuation [9], [11]. Meanwhile, agency theory explains that tax decisions may reflect conflicts of interest between managers and shareholders [24]. Tax avoidance can provide benefits through cash savings, but can also reduce transparency and increase corporate reputational risk [13], [25].

2.2 ESG and Firm Value

ESG is understood as non-financial information that helps investors assess the overall quality of a company more broadly. ESG disclosure provides an overview of transparency, governance, environmental risk management, social responsibility, and the company's sustainability orientation. This information is relevant to the market because it can reduce information asymmetry and improve the information environment quality for investors [9]. [10] also showed that ESG disclosure can lower the cost of debt financing, indicating that capital providers view ESG as a signal of greater transparency and lower risk. In the mining sector, the function of ESG becomes stronger because company activities are related to ecological risks, reclamation, emissions, occupational safety, and relationships with the surrounding communities. [7] emphasized that mining has a direct impact on biodiversity, so the market requires sustainability information to assess the company's long-term risks.

Empirical evidence shows that ESG can enhance firm value, although the results are not always uniform. [2] found that ESG performance has a positive effect on firm value in Chinese companies, including when firm value is measured by the market-to-book ratio.

[11] showed that ESG disclosure has a positive effect on firm performance, especially in companies with investors who have ESG preferences. [12] also found that ESG disclosure increases firm value, although the influence of the ESG score became more evident after the pandemic. Recent findings from [3] reinforce this argument by showing that ESG has a positive effect on firm value when measured by Tobin's Q and Price to Book. Based on these theoretical arguments and empirical evidence, ESG is expected to increase firm value.

H1: ESG has a positive effect on firm value.

2.3 Effective Tax Rate as a Mediating Mechanism

After ESG is positioned as a factor that can enhance firm value, this relationship needs to be explained through internal decisions that reflect governance consistency. One relevant decision is corporate tax behavior. Effective Tax Rate (ETR) represents the proportion of income tax expense to pre-tax profit and is often used as an indicator of corporate tax behavior. A higher ETR generally indicates a lower level of tax avoidance, whereas a lower ETR may indicate a smaller effective tax burden relative to the firm's profit [15], [16]. From the ESG perspective, tax behavior is related not only to cost efficiency but also to corporate compliance, reputation, and legitimacy.

Firms with better ESG performance tend to manage their tax behavior to align with stakeholder expectations. Aggressive tax avoidance practices can undermine ESG credibility because taxes relate to a company's contributions to the state and society. [19] demonstrate that tax avoidance is one of the economic channels linking ESG disclosure and long-term firm value. [13] also emphasize that the relationship between tax avoidance and firm value is influenced by the quality of ESG disclosure, as the market assesses whether a firm's tax strategy is consistent with transparency and corporate responsibility. Based on these arguments, companies with higher ESG are expected to have a higher ETR.

ETR can also affect firm value because investors interpret tax behavior as a signal of fiscal risk, governance quality, and reputational risk. From the perspective of signaling theory, ESG information and tax behavior help investors assess firm credibility, particularly when tax decisions demonstrate higher levels of compliance and transparency [14]. [20] show that tax avoidance and ESG interact in shaping market valuation, while [13] find that tax avoidance can decrease firm value when perceived to increase risk and reduce transparency. Therefore, ETR can serve as a mechanism that bridges the relationship between ESG and firm value. Sound ESG is expected to foster more compliant tax behavior, which in turn strengthens investor perception of PBV. Based on this explanation, ETR is positioned not only as a measure of corporate tax behavior but also as a channel explaining how ESG influences the market's assessment of the firm.

H2: ESG has a positive effect on Effective Tax Rate.

H3: Effective Tax Rate has a positive effect on firm value.

H4: Effective Tax Rate mediates the relationship between ESG and firm value.

3. METHODS

3.1 Research Design

This study employs a quantitative approach with an explanatory design to examine the effect of ESG on firm value, with the Effective Tax Rate as a mediating variable. The data used consist of secondary data in the form of firm-year observations from mining sector companies listed on the Indonesia Stock Exchange over a five-year observation period. The research sample comprises 115 observations selected using purposive sampling. The

sample criteria include mining sector companies with available ESG data, complete financial statements, stock price data, book value of equity, income tax expense, pre-tax income, total assets, total liabilities, and net income during the study period. Observations with negative pre-tax income were excluded because ETR values are not economically meaningful under these conditions.

3.2 *Variables and Measurement*

The variables in this study consist of firm value, ESG disclosure, Effective Tax Rate, and control variables. Firm value is measured using Price to Book Value (PBV), which is the ratio between the market price per share and the book value per share. PBV is used because it captures how the market values a company relative to its accounting equity [2], [3]. The ESG variable is measured using an ESG disclosure index based on content analysis of the company's annual and/or sustainability reports. Each disclosure item is given a score of 1 if disclosed and 0 if not disclosed, then the total disclosure score is divided by the number of items used in the index. This disclosure index approach is consistent with previous ESG disclosure research that uses the company's non-financial information to assess transparency and sustainability practices [10], [18].

The mediating variable in this study is the Effective Tax Rate (ETR), calculated as income tax expense divided by pre-tax income. ETR is widely used in tax literature as a measure of corporate tax behavior, since a higher ETR generally indicates a lower tendency toward tax avoidance [15], [16]. The control variables include firm size, leverage, and profitability. Firm size is measured using the natural logarithm of total assets, leverage is calculated as total liabilities to total assets, while profitability is measured using return on assets (ROA), which is net income divided by total assets [2], [3], [12].

Table 1. Operational Definition and Measurement of Variables

Variable	Symbol	Measurement	Main Source
Firm Value	PBV	Market price per share / Book value per share	[26], [27]
ESG Disclosure	ESG	Total disclosed ESG items / Total ESG disclosure items	[28], [29]
Effective Tax Rate	ETR	Income tax expense / Profit before tax	[15], [30]
Firm Size	SIZE	Natural logarithm of total assets	[31]
Leverage	LEV	Total liabilities / Total assets	[32]
Profitability	ROA	Net income / Total assets	[33]

3.3 *Data Analysis Technique*

Data were analyzed using Partial Least Squares via SmartPLS. All variables in this study were treated as observed variables because each was measured with a single indicator. Therefore, model evaluation focused on the structural model rather than the measurement model. The analysis was conducted through several stages, namely testing inner collinearity using VIF, testing the R-square value, testing the path coefficient, as well as testing the significance of relationships between variables using the t-statistic and p-value from the bootstrapping procedure. Mediation testing was carried out through the specific indirect effect, while the overall strength of influence was analyzed through the total effect. The research model is considered to support the hypothesis if the direction of the coefficient aligns with predictions and the p-value is below the specified significance level.

4. RESULTS AND DISCUSSION

4.1 Result

a. Statistic Descriptive

Descriptive statistics are used to provide an initial overview of the characteristics of the research data before structural model evaluation is conducted. This analysis includes the number of observations, minimum value, maximum value, mean, and standard deviation of each variable used in the study. The research sample consists of 115 company observations from the mining sector during the observation period.

Table 2. Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
ESG	115	0.00	100.00	52.2987	31.76659
PBV	115	2.10	12.11	7.4966	3.26330
ETR	115	27.60	47.60	32.7862	9.40546
Size	115	8.82	19.02	15.2480	2.76850

Source: Processed Data, 2026

Based on the results of descriptive statistics, the number of observations used in this study is 115 data points. The valid N listwise value of 115 indicates that all data can be used in the analysis and there are no missing data in the research variables.

The ESG variable has a minimum value of 0.00 and a maximum value of 100.00, with a mean value of 52.2987 and a standard deviation of 31.76659. These results show that the companies' ESG levels in the sample are quite diverse. The mean ESG of 52.2987 indicates that, in general, companies are at a moderate ESG level. The rather large standard deviation shows a high variation in ESG levels among companies.

The firm value variable, proxied by PBV, has a minimum value of 2.10 and a maximum value of 12.11. The mean PBV value of 7.4966 with a standard deviation of 3.26330 shows that, in general, companies in the sample have a market value higher than their book value. The rather wide PBV value range indicates a difference in firm value among observations.

The Effective Tax Rate variable has a minimum value of 27.60 and a maximum value of 47.60, with a mean value of 32.7862 and a standard deviation of 9.40546. These results indicate that the effective tax rate of companies in the sample shows quite a varied range. The average ETR of 32.7862 shows that, in general, companies have a relatively high effective tax burden.

The firm size variable has a minimum value of 8.82 and a maximum value of 19.02. The mean value of 15.2480 with a standard deviation of 2.76850 indicates that the research sample consists of companies of various sizes. This variation in firm size is relevant to control for because the scale of the company may be related to resource capacity, market exposure, and external monitoring.

b. Structural Model Evaluation

Structural model evaluation is conducted to describe the relationships between variables in the research

model. This model tests the effect of ESG on firm value, both directly and indirectly through the Effective Tax Rate. Size is included as a control variable to control for the effect of firm size on ETR and firm value. The results of the PLS structural model estimation are shown in Figure 1.

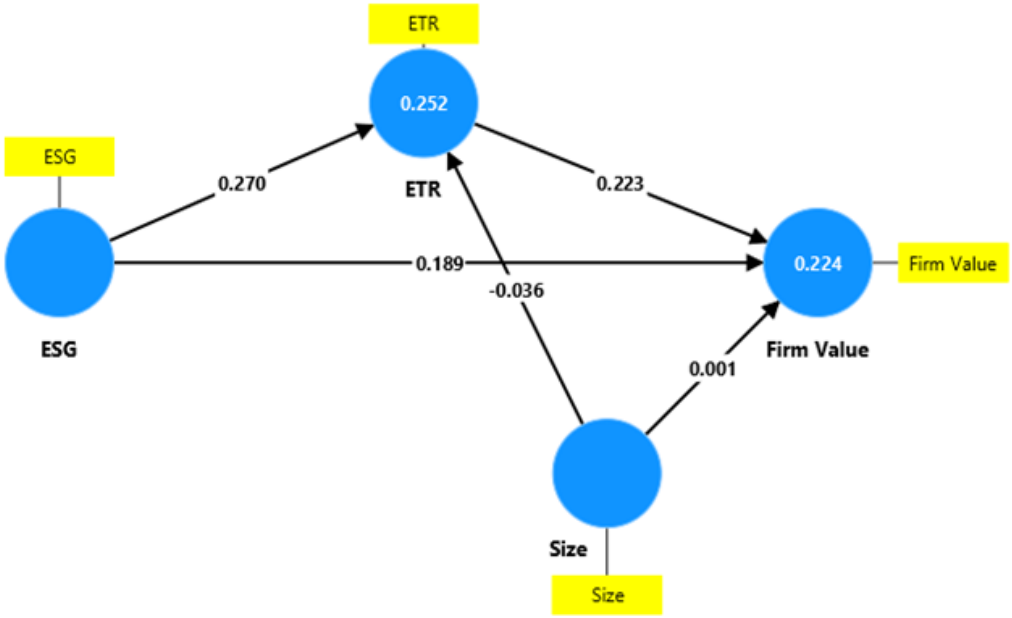


Figure 1. Structural Model of PLS Result
Source: SmartPLS output, processed data, 2026

Based on Figure 1, ESG has a positive coefficient for ETR of 0.270 and for firm value of 0.189. ETR also has a positive coefficient for firm value of 0.223. Size shows a negative coefficient for ETR of -0.036 and a very small coefficient for firm value of 0.001. The R-square value for ETR is 0.252, while the R-square value for firm value is 0.224. Before further interpreting the relationships between variables, an evaluation of the structural model should begin with a collinearity test to ensure that there are no multicollinearity issues among predictor variables. The results of the collinearity test are presented in Table 3.

Table 3. Collinearity Statistics (VIF)

Correlation	VIF
ESG → ETR	1.023
ESG → Firm Value	1.032
ETR → Firm Value	1.051
Size → ETR	1.023
Size → Firm Value	1.050

Source: Processed data, 2026

Based on Table 3, all VIF values are in the range of 1.023 to 1.051. These values are well below the common threshold of 5, indicating that the model does not exhibit multicollinearity issues. Consequently, the variables ESG, ETR, and Size can

be used in the structural model testing because there is no excessive linear relationship among the predictor variables. After the model is confirmed to be free from collinearity issues, the evaluation proceeds by examining the R-square value to assess the model's ability to explain the endogenous variables. In this study, the endogenous variables consist of ETR and firm value.

Table 4. R-square

Endogen Variable	R-square	R-square Adjusted
ETR	0.252	0.251
Firm Value	0.224	0.219

Source: Processed data, 2026

Based on Table 4, the R-square value for ETR is 0.252. This result indicates that ESG and Size are able to explain 25.2% of the variation in ETR, while the remaining 74.8% is explained by other factors outside the research model. The R-square value for Firm Value is 0.224, which means that ESG, ETR, and Size are able to explain 22.4% of the variation in firm value, while the remaining 77.6% is explained by other variables outside the model. These values indicate that the model has an adequate explanatory power to test the relationship between ESG, ETR, and firm value in mining sector companies.

c. Direct Effect Testing

Direct effect testing was conducted to assess the direction and significance of the relationships between variables in the structural model. This test uses path coefficient values, t-statistics, and p-values from the bootstrapping results.

Table 5. Path Coefficient

Correlation	Original Sample	Sample Mean	STDEV	T-statistic	P-value	Information
ESG → ETR	0.270	0.270	0.129	2.087	0.037	Significant
ESG → Firm Value	0.189	0.188	0.093	2.023	0.043	Significant
ETR → Firm Value	0.223	0.224	0.080	2.773	0.006	Significant
Size → ETR	-0.036	-0.035	0.021	1.728	0.084	Not Significant
Size → Firm Value	0.001	0.000	0.043	0.029	0.977	Not Significant

Source: Processed data, 2026

Based on Table 5, ESG has a positive effect on ETR with a coefficient of 0.270 and a t-statistic value of 2.087. This result indicates that the higher the level of ESG disclosure, the higher the company's ETR. This finding supports H2 and indicates that companies with better ESG disclosure tend to exhibit more compliant tax behavior.

ESG also has a positive effect on firm value with a coefficient of 0.189 and a t-statistic value of 2.023. This

result supports H1, so ESG can be understood as non-financial information that is valued by the market. Companies with a higher level of ESG disclosure tend to have higher firm value.

ETR has a positive effect on firm value with a coefficient of 0.223 and a t-statistic value of 2.773. This result supports H3 and shows that more compliant tax behavior can be a positive signal for investors. A higher ETR may be perceived as indicating lower fiscal risk, better transparency, and stronger governance.

The control variable Size does not have a significant effect on either ETR or firm value. Size has a negative coefficient on ETR of -0.036 with a p-value of 0.084, as well as a very small positive coefficient on firm value of 0.001 with a p-value of 0.977. These results show that firm size is not a major factor explaining ETR and firm value variation in this model.

d. Testing of Indirect Effect and Total Effect

Indirect effect testing was conducted to determine whether ETR mediates the relationship between ESG and firm value. The test results are presented in Table 6.

Table 6. Specific Indirect Effect

Correlation	Original Sample	Sample Mean	STDEV	T-statistic	P-value	Information
ESG → ETR → Firm Value	0.060	0.061	0.020	2.913	0.004	Significant

Source: Processed data, 2026

Based on Table 6, the indirect effect of ESG on firm value through ETR has a coefficient of 0.060, a t-statistic value of 2.913, and a p-value of 0.000. These results indicate that ETR mediates the relationship between ESG and firm value. In other words, higher ESG disclosure can encourage more compliant tax behavior, which in turn increases the market valuation of the firm. Since the direct effect of ESG on firm value remains significant, the resulting mediation is partial.

Table 7. Total Effect

Correlation	Original Sample	Sample Mean	STDEV	T-statistic	P-value	Information
ESG → ETR	0.270	0.270	0.129	2.087	0.037	Significant
ESG → Firm Value	0.249	0.249	0.123	2.023	0.043	Significant
ETR → Firm Value	0.223	0.224	0.080	2.773	0.006	Significant
Size → ETR	-0.036	-0.035	0.021	1.728	0.084	Not Significant
Size → Firm Value	0.001	0.000	0.043	0.029	0.977	Not Significant

Source: Processed data, 2026

Table 7 shows that the total effect of ESG on firm value is 0.249 and significant. This value is greater than the direct effect of ESG on firm value, which is 0.189. These results indicate that the presence of ETR strengthens the effect of ESG on firm value. Thus, ESG not only affects firm value directly, but also through corporate tax behavior.

e. Summary of Hypothesis Results

After the direct and indirect effect tests were conducted, the results of the hypothesis testing are summarized to demonstrate empirical support for the research model. This summary presents the decision for each hypothesis based on the direction of the coefficients and the significance level of the relationships between variables.

Table 8. Summary of Hypothesis Testing Results

Hypothesis	Correlation	Result
H1	ESG → Firm Value	Supported
H2	ESG → ETR	Supported
H3	ETR → Firm Value	Supported
H4	ESG → ETR → Firm Value	Supported

Source: Processed data, 2026

Based on the test results, all the main hypotheses in this study received empirical support. ESG was shown to have a positive effect on ETR and firm value, while ETR also had a positive effect on firm value. The mediation test results indicate that ETR mediates the relationship between ESG and firm value. These findings suggest that ESG disclosure is not only directly related to market valuation, but also operates through corporate tax behavior as an internal mechanism reflecting compliance, fiscal risk, and governance quality in mining sector companies.

4.2 Discussion

The test results indicate that ESG has a positive effect on firm value. This finding supports H1 and shows that ESG disclosure is perceived by the market as relevant non-financial information in assessing company quality. From the stakeholder theory perspective, companies that respond to the interests of investors, regulators, society, and the environment tend to gain greater market trust. This finding is also consistent with signaling theory, since ESG signals transparency, governance quality, and a firm's ability to manage sustainability risks. These results are consistent with [2], [3], [11], [12], who show that ESG can enhance company performance and value.

ESG is also proven to have a positive effect on ETR. This finding supports H2 and indicates that firms with higher ESG disclosure tend to display more compliant tax behavior. From the legitimacy theory perspective, companies communicating a sustainability commitment need to maintain consistency between their ESG image and internal decisions. Aggressive tax practices can undermine legitimacy, as taxes are related to the company's contribution to the state and society. This result is in line with [16], [19], who position tax behavior as a key aspect in the relationship between corporate responsibility and economic value.

The next result shows that ETR has a positive effect on firm value. This finding supports H3 and indicates that investors may read ETR as a signal of tax compliance, fiscal risk, and governance quality. A higher ETR generally indicates a lower level of tax avoidance, thereby reducing market concerns regarding the risks of tax audits, sanctions, and reputational damage. This finding supports [13], who found that tax avoidance can reduce firm value when it is perceived to increase risk and reduce transparency. This result is also in line with [20], who assert that tax strategy and ESG should be understood together when explaining market valuation.

Mediation testing shows that ETR mediates the relationship between ESG and firm value. This finding supports H4 and indicates that ESG affects firm value not only directly, but also through corporate tax behavior. Since the direct effect of ESG on firm value remains significant, the mediation that occurs is partial. In other words, ESG can increase PBV via two pathways: directly signaling the market and through ETR as an internal mechanism reflecting tax compliance. This finding extends [19] by showing that ETR can serve as a mechanism bridging ESG and firm value in the Indonesian mining sector.

5. CONCLUSION

This study aims to examine the effect of ESG on firm value with the Effective Tax Rate (ETR) as a mediating variable in mining sector companies in Indonesia. Based on PLS testing of 115 observations, ESG is proven to have a positive effect on firm value and ETR. ETR also has a positive effect on firm value. Mediation testing results show that ETR mediates the relationship between ESG and firm value. These findings indicate that ESG disclosure is not only perceived as an external signal of transparency and sustainability but also relates to the company's internal decisions, particularly tax behavior. Thus, firm value in the mining sector can be explained through a combination of ESG disclosure quality and tax behavior, which reflects compliance, fiscal risk, and governance.

Theoretically, this study reinforces stakeholder theory, legitimacy theory, signaling theory, and agency theory in explaining the relationship between ESG, ETR, and firm value. The standing position of this study lies in the placement of ETR as a mediation mechanism, not merely as a tax burden indicator or control variable. This position distinguishes this study from research that only examines the direct relationship between ESG and firm value, as well as from studies that position ESG as a moderator in the relationship between tax avoidance and firm value. Practically, the results of this study provide input for investors to evaluate ESG alongside tax behavior as signals of risk, reputation, and governance quality. For the management of mining companies, these results indicate that ESG disclosure needs to be supported by consistent tax policies so that sustainability credibility can be accepted by the market. For regulators, these findings emphasize the need for integration of ESG transparency policies and tax compliance to strengthen market confidence.

This study has several limitations. First, the research sample is limited to companies in the mining sector in Indonesia, so the results may not be generalizable to other sectors. Second, ESG is measured based on a disclosure index, making the results dependent on information available in company reports. Third, this study uses ETR as a proxy for tax behavior, whereas corporate tax behavior can also be measured with other proxies such as cash ETR, current ETR, or book-tax differences. Fourth, the research model only includes Size as a control variable, so other factors such as leverage, profitability, ownership, audit quality, commodity prices, and macroeconomic conditions have not yet been further analyzed.

Future research can expand the sample to other sectors with high ESG pressure, such as energy, manufacturing,

infrastructure, and plantations. Subsequent studies can also use a longer observation period so that the dynamics of ESG, tax behavior, and firm value can be analyzed more stably. In addition, future research can compare several tax behavior proxies, such as ETR, cash ETR, current ETR, and book-tax differences, to obtain a more comprehensive understanding. Further studies can also add moderating variables, such as governance quality, institutional ownership, audit quality, regulatory pressure, or commodity price volatility, so that the mechanism of the ESG–firm value relationship can be explained in greater depth.

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