

WHEN SUSTAINABILITY MISLEADS: GREENWASHING, CORPORATE BEHAVIOR, AND MARKET PERFORMANCE

Linda Ayu Wulandari^{1*}, Dewi Ratnawati², Inka Nur Aini³
^{1,2,3}Master of Accounting Program, Faculty of Economic and Business, Universitas
Mercu Buana, Indonesia
*Corresponding Author:
lindaayuwulandari3@gmail.com

Abstract

This study examines the effect of environmental disclosure, social disclosure, governance disclosure, operational efficiency, and greenwashing on market performance, as well as the moderating role of tax aggressiveness in mining companies listed on the Indonesia Stock Exchange during 2020–2024. The study is motivated by increasing sustainability pressure and growing investor concerns regarding the credibility of ESG disclosure and greenwashing practices in environmentally sensitive industries. The sample consists of 90 firm-year observations obtained from 18 mining companies selected using purposive sampling. Panel data regression and Moderated Regression Analysis (MRA) with the Random Effect Model (REM) were employed to test the proposed hypotheses. The results indicate that environmental disclosure and operational efficiency positively affect market performance, while social disclosure and greenwashing negatively affect market performance. Governance disclosure does not significantly influence market performance. Furthermore, tax aggressiveness strengthens the negative effect of social disclosure and weakens the positive effect of operational efficiency on market performance. In contrast, tax aggressiveness strengthens the influence of governance disclosure on market performance but does not moderate the relationship between environmental disclosure, greenwashing, and market performance. These findings suggest that investors increasingly evaluate the consistency between sustainability disclosure, operational behavior, and corporate financial practices when assessing firm value and long-term sustainability credibility.

Keywords: ESG Disclosure, Operational Efficiency, Greenwashing, Tax Aggressiveness, Market Performance

1. Introduction

Global sustainability pressure has transformed corporate reporting practices and investor decision-making across capital markets. Companies are increasingly expected to demonstrate environmental responsibility, social accountability, and governance transparency as part of long-term value creation strategies (Gillan et al., 2021; Velte, 2023). Following the post-pandemic recovery, investors placed greater emphasis on sustainability resilience and corporate credibility in evaluating firm prospects (Albuquerque et al., 2020; Saini et al., 2025). However, sustainability disclosure is not always accompanied by substantive environmental commitment, leading to growing concerns regarding symbolic sustainability practices and greenwashing behavior (Huang et al., 2025; Yue et al., 2026). Several firms with strong ESG visibility have simultaneously faced ESG controversies and declining investor trust due to inconsistencies between sustainability claims and actual practices (Pinto-Gutiérrez et al., 2026; Wang & Zhao, 2026). These conditions indicate that sustainability narratives may

influence investor perception through reputational distortion, ultimately affecting market valuation. In Indonesia's mining sector, investor valuation also showed an increasing trend during 2020–2024, reflected by the rise in Price-to-Book Value (PBV) from approximately 1.75 to 1.81. This increase suggests stronger investor expectations regarding future growth and sustainability resilience, while also raising questions about whether higher valuation reflects genuine sustainability commitment or merely symbolic greenwashing communication.

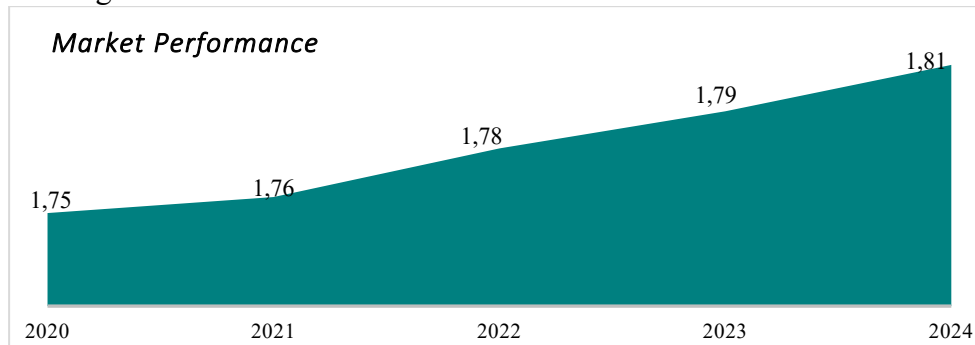


Figure 1. Market Performance of Mining Sector (2020–2024)

Source: Processed data (2026)

The urgency of this research is driven by several critical factors. First, the mining sector in Indonesia faces unique sustainability challenges due to its significant environmental footprint, social impact on local communities, and high regulatory scrutiny, making it an ideal context for examining the relationship between sustainability practices, greenwashing behavior, and market performance. Second, the increasing trend in PBV during 2020–2024 indicates growing investor confidence in the mining sector, yet it remains unclear whether this valuation reflects genuine sustainability commitment or symbolic greenwashing communication, necessitating empirical investigation. Third, the inconsistency of previous research findings regarding the influence of ESG disclosure on market performance indicates a research gap that needs to be addressed. Some studies demonstrate that environmental, social, and governance disclosure positively influences market performance through enhanced corporate legitimacy and investor trust (Bamel et al., 2025; Dasilas & Karanović, 2025; Demiraj et al., 2025; Narula et al., 2024; Pasupuleti et al., 2024; Yan et al., 2025), while others reveal that sustainability disclosure does not always generate positive market responses because investors increasingly question the credibility of symbolic sustainability reporting practices (Dkhili, 2024; Yue et al., 2026). Fourth, greenwashing behavior has been found to weaken firm credibility and reduce market confidence when sustainability claims are perceived as inconsistent with substantive environmental commitment (Luhglatno et al., 2026; Pinto-Gutiérrez et al., 2026). Other studies further indicate that excessive ESG signaling may trigger investor skepticism and create adverse market reactions, particularly in highly scrutinized industries and emerging markets characterized by weak monitoring mechanisms (Su et al., 2026; Taddeo & Weber, 2026; Tian et al., 2025; Wang & Zhao, 2026). Fifth, the role of tax aggressiveness as a moderating variable in the relationship between sustainability practices, greenwashing, and market performance has not been extensively studied, particularly in the Indonesian mining sector context. Previous studies on ESG disclosure, greenwashing, and corporate performance still reveal several unresolved gaps. Most studies rely on aggregate ESG scores without distinguishing environmental, social, and governance dimensions, limiting understanding of the specific impact of each disclosure component on market performance. Existing greenwashing research mainly emphasizes

environmental legitimacy and sustainability credibility, while limited attention has been given to the interaction between greenwashing, operational behavior, and tax aggressiveness in shaping investor perception and market valuation. Empirical evidence from environmentally sensitive industries in emerging markets also remains limited, particularly in the mining sector, which faces high environmental scrutiny and ESG pressure.

Several studies demonstrate that environmental disclosure, social disclosure, governance disclosure, and sustainability-oriented corporate practices positively influence market performance because they enhance corporate legitimacy, transparency, investor trust, and long-term competitiveness (Bamel et al., 2025; Dasilas & Karanović, 2025; Demiraj et al., 2025; Narula et al., 2024; Pasupuleti et al., 2024; Yan et al., 2025). Firms with stronger ESG disclosure are perceived as more resilient and capable of managing sustainability-related risks, thereby improving market valuation and investor confidence (Albuquerque et al., 2020; Lu et al., 2025). Operational efficiency represented through operating cost management has also been associated with better market performance because efficient firms tend to exhibit stronger financial discipline and operational sustainability (Lee, 2023; Olaiya et al., 2025; Ren et al., 2025). However, empirical findings remain inconsistent. Several studies reveal that sustainability disclosure does not always generate positive market responses because investors increasingly question the credibility of symbolic sustainability reporting practices (Dkhili, 2024; Yue et al., 2026). Greenwashing behavior has been found to weaken firm credibility and reduce market confidence when sustainability claims are perceived as inconsistent with substantive environmental commitment (Luhglatno et al., 2026; Pinto-Gutiérrez et al., 2026). Other studies further indicate that excessive ESG signaling may trigger investor skepticism and create adverse market reactions, particularly in highly scrutinized industries and emerging markets characterized by weak monitoring mechanisms (Su et al., 2026; Taddeo & Weber, 2026; Tian et al., 2025; Wang & Zhao, 2026). These contradictory findings indicate that sustainability disclosure and operational practices may produce different market outcomes depending on whether investors perceive corporate sustainability behavior as substantive or merely symbolic.

Beyond sustainability practices, financial behavior represented by tax aggressiveness has emerged as another critical factor influencing investor assessment. Tax aggressiveness reflects managerial efforts to minimize tax obligations through strategic financial arrangements, which may signal efficiency but may also indicate opportunistic corporate behavior (Jibril & Dikko, 2025; Velte, 2023). Firms engaging in aggressive tax strategies are often associated with higher agency risk, lower transparency, and weaker ethical commitment, potentially affecting investor trust in sustainability disclosure (Putri & Dewi, 2026; Toly et al., 2026). Several studies argue that tax aggressiveness may weaken the positive impact of ESG disclosure because investors may perceive sustainability reporting as inconsistent with corporate ethical conduct (Hasan et al., 2023; Yahaya, 2026b). Conversely, other studies suggest that efficient tax management may strengthen financial flexibility and improve market valuation under certain economic conditions (Judijanto et al., 2026; Na et al., 2026). These mixed findings indicate that tax aggressiveness may function not only as a financial strategy but also as a moderating mechanism capable of shaping the relationship between sustainability practices, greenwashing behavior, and market performance.

The research gap in this study lies in the limited understanding of how environmental, social, and governance disclosure, operational cost ratio, and greenwashing influence

market performance, with tax aggressiveness as a moderating variable. While individual studies have examined the direct effects of ESG disclosure on firm performance, the indirect pathways through which sustainability practices translate into market valuation remain underexplored. Additionally, most previous studies have relied on aggregate ESG scores without distinguishing environmental, social, and governance dimensions, limiting understanding of the specific impact of each disclosure component. Existing greenwashing research has mainly emphasized environmental legitimacy and sustainability credibility, while limited attention has been given to the interaction between greenwashing, operational behavior, and tax aggressiveness in shaping investor perception and market valuation. Furthermore, empirical evidence from environmentally sensitive industries in emerging markets remains limited, particularly in the mining sector, which faces high environmental scrutiny and ESG pressure.

The novelty of this research lies in the integration of several aspects. First, this study focuses on the Indonesian mining sector during the 2020–2024 period, which represents a unique context characterized by high environmental sensitivity, regulatory scrutiny, and increasing investor attention to sustainability practices. Second, this study develops an integrative model that simultaneously examines the influence of environmental disclosure, social disclosure, governance disclosure, operational cost ratio, and greenwashing on market performance, with tax aggressiveness as a moderating variable. Third, this study distinguishes environmental, social, and governance dimensions of ESG disclosure to provide a more nuanced understanding of the specific impact of each disclosure component on market performance. Fourth, this study positions tax aggressiveness as a moderating variable, enabling the examination of whether aggressive tax strategies strengthen or weaken the relationship between sustainability practices and market performance. Fifth, this study contributes to the limited empirical evidence on greenwashing behavior in the Indonesian mining sector, providing insights into whether sustainability narratives reflect genuine commitment or merely symbolic communication.

The purpose of this study is to examine the influence of environmental, social, governance disclosure, operational cost ratio, and greenwashing on market performance, with tax aggressiveness as a moderating variable, using PBV as the market performance proxy for Indonesian mining companies during 2020–2024. Specifically, this research aims to: (1) analyze the effect of environmental disclosure on market performance; (2) analyze the effect of social disclosure on market performance; (3) analyze the effect of governance disclosure on market performance; (4) analyze the effect of operational cost ratio on market performance; (5) analyze the effect of greenwashing on market performance; and (6) analyze the moderating role of tax aggressiveness in the relationships between environmental, social, governance disclosure, operational cost ratio, greenwashing, and market performance.

The contribution of this research is multifaceted. From a theoretical perspective, this research contributes to the enrichment of literature on sustainability disclosure, greenwashing, and market performance by proposing and testing an integrative model that links ESG disclosure dimensions, operational efficiency, and greenwashing with market performance, incorporating tax aggressiveness as a moderating variable. The findings contribute to the understanding of how specific ESG disclosure components influence market valuation and how tax aggressiveness moderates these relationships, thereby extending the application of stakeholder theory, signalling theory, and legitimacy theory to the context of sustainability reporting in emerging markets. From a practical perspective, this study provides actionable insights for corporate management, investors,

and regulators in assessing and managing sustainability practices, greenwashing risks, and market valuation. For corporate management, the findings provide guidance on which sustainability disclosure dimensions are most valued by investors and how operational efficiency and tax behavior influence market perception. For investors, the results offer insights into how to distinguish between substantive sustainability commitment and symbolic greenwashing communication when making investment decisions. For regulators, particularly the Financial Services Authority (OJK) and the Ministry of Energy and Mineral Resources, this study provides empirical evidence to support the development of more effective sustainability disclosure regulations and monitoring mechanisms in the mining sector.

2. Theoretical Background

2.1 Agency Theory

Agency Theory explains that conflicts of interest between management and shareholders may arise due to information asymmetry and differences in corporate objectives (Jensen et al., 1976). In this study, governance disclosure functions as a monitoring mechanism to reduce opportunistic managerial behavior through greater transparency and accountability. Strong governance can increase investor confidence and improve market valuation because firms are perceived to have more effective control systems. Conversely, tax aggressiveness is often associated with opportunistic financial behavior that may weaken sustainability credibility (Velte, 2023). When high sustainability disclosure is accompanied by aggressive tax practices, investors may question corporate integrity, thereby influencing market perception and market performance (Hasan et al., 2023; Jibril & Dikko, 2025).

2.2 Stakeholder Theory

Stakeholder Theory explains that companies are responsible not only to shareholders but also to stakeholders affected by corporate activities, including investors, society, employees, customers, and the environment (Freeman, 1984). In this study, environmental disclosure, social disclosure, governance disclosure, and Operational Cost Ratio (OCR) reflect corporate transparency, responsibility, and resource management capability in fulfilling stakeholder expectations (Lee, 2023; Mahmood et al., 2025; Narula et al., 2024). Strong sustainability disclosure and operational efficiency may enhance corporate credibility, stakeholder trust, and market performance (Ren et al., 2025). Conversely, greenwashing and tax aggressiveness may weaken stakeholder confidence because they are perceived as inconsistent with sustainability and transparency principles (Huang et al., 2025; Pinto-Gutiérrez et al., 2026; Velte, 2023).

2.3 Legitimacy Theory

Legitimacy Theory explains that companies seek social acceptance by aligning corporate activities and disclosure with societal values, norms, and expectations to maintain long-term business sustainability (Dowling & Pfeffer, 1975; Suchman, 1995). In this study, environmental, social, and governance disclosure reflect corporate efforts to demonstrate responsibility and strengthen public trust (Z. Lu & Sander, 2026; D. Yue et al., 2026). However, legitimacy may become symbolic when sustainability disclosure is not supported by substantive implementation, leading to greenwashing practices (Wang et al., 2026). In addition, aggressive tax behavior may weaken corporate legitimacy because it is perceived as inconsistent with corporate social responsibility principles,

thereby affecting investor trust and market performance (Jibril & Dikko, 2025; Luhgiatno et al., 2026; Yahaya, 2026a).

2.4 Signaling Theory

Signaling Theory explains that companies convey information to investors through disclosure to reduce information asymmetry between management and external parties (Spence, 1973). In this study, environmental disclosure, social disclosure, governance disclosure, and Operational Cost Ratio (OCR) are seen as signals regarding company quality, operational efficiency, and company commitment to sustainability practices (Gillan et al., 2021; Narula et al., 2024). These positive signals can increase investor confidence and improve the company's market performance (Yan et al., 2025; Pasupuleti et al., 2024). However, when sustainability disclosure is not supported by substantive implementation, investors may view the disclosure as greenwashing, thereby lowering the company's credibility (Huang et al., 2025; Tian et al., 2025). In addition, tax aggressiveness can also weaken the credibility of a company's sustainability disclosure (Velte, 2023; Hasan et al., 2022).

2.5 Environmental Disclosure, Market Performance

Environmental Disclosure reflects transparency in the disclosure of information related to how companies manage the environment, control environmental risks, and how the company implements sustainability commitments (Wulandari, 2026). Signal theory is the foundation for how companies that disclose sustainability will provide signals to investors about how the company's quality will be in implementing sustainability in the future (Lu & Sander, 2026), then good environmental disclosure can provide legitimacy in the eyes of investors and the public because companies are considered responsible for the environment and increase investor interest in investing in companies and improve market performance (X. Wang & Zhao, 2026; A. Yue et al., 2026). So that environmental disclosure can increase market performance because environmental transparency is perceived to strengthen the company's credibility and increase investor confidence.

Bamel et al (2025), Dasilas & Karanović (2025), Demiraj et al (2025), Narula et al (2024), Pasupuleti et al (2024), Yan et al (2025) found that environmental disclosure contributes to stronger market valuation. Conversely Dkhili (2024), Tian et al (2025), Wang & Zhao (2026), Yue et al (2026) reported that environmental disclosure does not always improve market performance because investors increasingly question the credibility of sustainability reporting practices associated with symbolic disclosure and greenwashing behavior. Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H1: Environmental disclosure affects market performance

2.6 Social Disclosure, Market Performance

Social disclosure reflects the extent to which companies disclose information related to social responsibility, labor welfare, community relations, and stakeholder contributions. Based on legitimacy theory, companies seek social acceptance by demonstrating that their activities align with societal norms and expectations. In the mining sector, social disclosure is particularly important because mining activities are closely associated with occupational safety, community welfare, social conflict, and environmental-social impacts. Comprehensive social disclosure can signal that a company is capable of maintaining stable stakeholder relationships and minimizing social

risks (Wulandari et al., 2026). Moreover, social transparency may enhance corporate reputation and strengthen investor confidence regarding long-term business sustainability (Wulandari, 2026).

In line with Albuquerque et al (2020), Dasilas & Karanović (2025), Ren et al (2025), Saini et al (2025), Zhang et al (2025) found that social disclosure positively affects market performance because investors perceive firms as having stronger stakeholder relations and sustainable business prospects. However, Huang et al (2025), Pinto-Gutiérrez et al (2026), Taddeo & Weber (2026), Tian et al (2025) argued that investors may respond negatively when social disclosure is viewed as symbolic reputation-building without substantive social implementation. Based on these arguments, the following hypothesis is proposed:

H2: Social disclosure affects market performance

2.7 Governance Disclosure, Market Performance

Governance disclosure reflects corporate transparency regarding governance practices, supervisory mechanisms, risk control, and management accountability. Based on agency theory, governance disclosure is essential to reduce information asymmetry and conflicts of interest between management and shareholders arising from potential opportunistic behavior. Through transparent governance disclosure, companies signal that they possess effective internal control and monitoring systems capable of maintaining operational stability and long-term business sustainability. Governance transparency can also strengthen investor confidence in management quality, decision-making processes, and the company's ability to manage business and sustainability risks (Mahmood et al., 2025; Sormin et al., 2026). Consequently, credible governance practices may enhance market confidence and positively influence market performance.

Bamel et al (2025), Dasilas & Karanović, 2025; Demiraj et al., 2025; Yan et al., 2025; Zhang et al (2025) found that governance disclosure improves market performance because transparent governance reduces investment risk and increases corporate credibility. However, Dkhili (2024), Pinto-Gutiérrez et al (2026), Su et al (2026) argued that governance disclosure does not always receive a positive market response when investors perceive it merely as symbolic compliance rather than evidence of substantive governance quality. Based on these arguments, the following hypothesis is proposed:

H3: Governance disclosure affects market performance

2.8 Operational Efficiency, Market Performance

Operational efficiency, measured by the operational cost ratio (OCR), reflects a company's ability to manage operating costs relative to generated revenue. This ratio indicates how efficiently a company conducts its business activities while maintaining performance sustainability. Based on stakeholder theory, companies are expected to manage resources effectively to maintain business stability and fulfil stakeholder expectations in the long term. Efficient operational cost management can signal strong managerial quality, effective cost control, and greater operational resilience to investors (Wulandari, 2026). Moreover, operational efficiency may improve financial flexibility and strengthen market perception regarding the company's prospects. Consequently, OCR can influence market performance because investors tend to value companies with efficient operations as more stable and competitive firms.

Same with research by Abbas & Nainggolan (2023), Gazilas & Vozikis (2024), Lee (2023), Maina & Florence (2024), Olaiya & Alao (2025), Ren et al (2025) found that

operational efficiency positively affects market performance through improved cost management and operational stability. However, Luhglatno et al (2026), Pinto-Gutiérrez et al (2026), Taddeo & Weber (2026), Yue et al (2026) argued that operational efficiency does not always receive a positive market response when investors perceive firms as prioritizing financial efficiency and reputation over substantive sustainability commitments. Based on these arguments, the following hypothesis is proposed:

H4: Operational efficiency affects market performance

2.9 Greenwashing, Market Performance

Greenwashing reflects a condition in which companies attempt to build a positive sustainability image through ESG disclosure and sustainability communication that are not fully supported by substantive implementation. Based on signaling theory, sustainability disclosure serves as a signal to shape investor perceptions regarding corporate quality and long-term prospects. When discrepancies arise between sustainability claims and actual business practices, investors may perceive such disclosures as symbolic efforts aimed at maintaining legitimacy and reputation. This condition can increase investor skepticism toward the credibility of corporate sustainability reporting. Higher perceptions of greenwashing may reduce investor confidence in the quality of corporate information and negatively affect market performance (Tian et al., 2025; Yue et al., 2026)

Some research found that greenwashing affects market performance as investors begin to consider the credibility of sustainability disclosure in investment decision-making (Huang et al., 2025; Luhglatno et al., 2026; Pinto-Gutiérrez et al., 2026; Su et al., 2026; Taddeo & Weber, 2026; Wang et al., 2026) found that greenwashing negatively influences market performance because it increases reputational risk and weakens market trust. In contrast Bamel et al (2025), Demiraj et al (2025), Narula et al (2024), Yan et al (2025) reported that sustainability disclosure may still receive a positive market response, as investors continue to interpret sustainability information as a signal of long-term business stability and sustainability. Based on these arguments, the following hypothesis is proposed:

H5: Greenwashing affects market performance

2.10 Environmental Disclosure, Market Performance, Tax Aggressiveness

Environmental disclosure is used by companies to signal their commitment to environmental responsibility and long-term business sustainability. Based on signaling theory, comprehensive environmental disclosure can enhance corporate credibility because investors perceive the company as having stronger transparency and environmental accountability. The effectiveness of environmental disclosure in influencing market performance may depend on how investors evaluate the consistency between sustainability disclosure and the company's financial behavior. Tax aggressiveness reflects corporate efforts to minimize tax burdens through certain tax strategies that are often associated with opportunistic managerial behavior. When firms disclose strong environmental commitments while simultaneously exhibiting high tax aggressiveness, investors may perceive inconsistency between the company's sustainability image and its actual financial practices. Such conditions can weaken investor trust and influence market responses to environmental disclosure, ultimately affecting market performance.

Previous research by Jibril & Dikko (2025), Putri et al (2026), Toly et al (2026), Velte (2023), Yahaya (2026) found that tax aggressiveness influences stakeholder perceptions regarding corporate transparency and integrity. In addition, Pinto-Gutiérrez et al (2026), Taddeo & Weber (2026), Wang et al (2025), Yue et al (2026) showed that investors increasingly evaluate the consistency between sustainability disclosure and actual corporate behavior when assessing firm credibility. Based on these arguments, the following hypothesis is proposed:

H6: Tax aggressiveness moderates the effect of environmental disclosure on market performance

2.11 Social Disclosure, Market Performance, Tax Aggressiveness

Social disclosure reflects how companies communicate their social responsibility, stakeholder relations, workforce welfare, and community engagement. Based on legitimacy theory, companies seek social acceptance by aligning business activities with societal values and expectations. Effective social disclosure can improve investor perception because firms are viewed as capable of maintaining long-term stakeholder relationships and minimizing social risks. However, market responses to social disclosure also depend on how investors evaluate the consistency of overall corporate behavior. In agency theory, tax aggressiveness is often associated with opportunistic managerial behavior aimed at maximizing corporate interests through tax avoidance strategies. When companies actively promote a positive social image while simultaneously engaging in aggressive tax practices, investors may perceive inconsistency between the firm's social commitments and financial behavior. Such conditions can weaken the credibility of social disclosure and influence market performance.

Several studies by Jibril & Dikko (2025), Putri et al (2026), Toly et al (2026), Velte (2023), Yahaya (2026) found that tax aggressiveness affects stakeholder trust in corporate transparency and integrity. In addition, Pinto-Gutiérrez et al (2026), Su et al (2026) showed that investors increasingly assess consistency between sustainability disclosure and actual corporate behavior when evaluating corporate credibility. Based on these arguments, the following hypothesis is proposed:

H7: Tax aggressiveness moderates the effect of social disclosure on market performance

2.12 Governance Disclosure, Market Performance, Tax Aggressiveness

Governance disclosure reflects corporate transparency regarding governance practices, supervisory mechanisms, management accountability, and risk control. Based on agency theory, corporate governance aims to reduce conflicts of interest between management and shareholders through improved transparency and monitoring of managerial behavior. Comprehensive governance disclosure can increase investor confidence by signaling that the company possesses effective internal controls, strong supervision, and the ability to sustain long-term business performance. As a result, effective governance practices may strengthen market trust and positively influence market performance. However, the effectiveness of governance disclosure may also depend on how investors perceive the company's financial behavior, particularly tax aggressiveness. Tax aggressiveness is often viewed as opportunistic behavior aimed at minimizing tax burdens through certain tax strategies. When companies exhibit high governance disclosure while simultaneously engaging in aggressive tax practices,

investors may question whether governance is implemented substantively or merely used to maintain corporate image and legitimacy.

Studies by Hasan et al (2023), Jibril & Dikko (2025), Putri et al (2026), Velte (2023), Yahaya (2026) found that corporate tax behavior affects stakeholder perceptions of transparency and credibility. Furthermore, Pinto-Gutiérrez et al (2026), Taddeo & Weber (2026), Tian et al (2025) showed that investors increasingly evaluate consistency between governance disclosure and actual corporate behavior. Based on these arguments, the following hypothesis is proposed:

H8: Tax aggressiveness moderates the effect of governance disclosure on market performance

2.13 Operational Efficiency, Market Performance, Tax Aggressiveness

Operational efficiency, measured by the operational cost ratio (OCR), reflects a company's ability to manage operating costs relative to generated revenue and maintain long-term business stability. Based on stakeholder theory, companies are expected to manage resources effectively to sustain business operations and fulfill stakeholder expectations. High operational efficiency can provide a positive signal to investors that the company possesses strong cost control, effective management quality, and operational resilience. Consequently, investors tend to perceive efficient companies as more stable and capable of generating better prospects, which may improve market performance. However, investor perceptions of operational efficiency may also depend on how the company implements its financial strategies, particularly tax aggressiveness. Tax aggressiveness is often viewed as a financial strategy aimed at reducing tax burdens through certain tax practices. When firms exhibit strong operational efficiency while simultaneously engaging in aggressive tax behavior, investors may question whether the efficiency results from genuine operational effectiveness or opportunistic financial management practices.

Tax aggressiveness is often seen as a form of a company's financial strategy to reduce the tax. Previous studies by Hasan et al (2023), Jibril & Dikko (2025), Putri et al (2026), Toly et al (2026), Velte (2023) found that corporate tax behavior influences investor perceptions regarding transparency and firm quality. Furthermore, Pinto-Gutiérrez et al (2026), Taddeo & Weber (2026), Su et al (2026) showed that investors increasingly evaluate consistency between sustainability practices and corporate financial behavior when assessing corporate credibility:

H9: Tax aggressiveness moderates the effect of operational efficiency on market performance

2.14 Greenwashing, Market Performance, Tax Aggressiveness

Greenwashing reflects conditions in which companies build a positive sustainability image through ESG disclosure and sustainability communication that are not fully supported by substantive implementation. Based on signaling theory, sustainability disclosure is used to shape investor perceptions regarding corporate quality and long-term business prospects. However, when investors perceive inconsistencies between sustainability claims and actual corporate practices, such disclosure may be viewed as symbolic efforts intended merely to maintain legitimacy. In this context, tax aggressiveness can strengthen negative investor perceptions of greenwashing. Companies that actively promote sustainability while simultaneously engaging in aggressive tax practices may be perceived as inconsistent between sustainability commitments and

financial behavior. These conditions can reduce investor confidence in the credibility of sustainability disclosure and ultimately affect market performance.

Previous studies by Huang et al (2025), Pinto-Gutiérrez et al (2026), Su et al (2026), Taddeo & Weber (2026), Wang et al (2025), Yue et al (2026) found that greenwashing increases market skepticism and influences investor evaluations of firms. Furthermore, Abis & Damilano (2026), Jibril & Dikko (2025), Putri et al (2026), Yahaya (2026) showed that tax aggressiveness affects perceptions of corporate integrity and transparency. Higher tax aggressiveness may increase investor sensitivity toward greenwashing indications because firms are perceived as prioritizing opportunistic interests over substantive sustainability commitments.

H10: Tax aggressiveness moderates the effect of greenwashing on market performance

3. Methods

3.1 Research Design

This study employs a quantitative approach using descriptive and verificative methods to examine the effect of environmental disclosure, social disclosure, governance disclosure, operational cost ratio, and greenwashing on market performance, with tax aggressiveness as a moderating variable. The verificative method is used to analyze the causal relationship between sustainability-related corporate behavior and market-based firm valuation through panel data regression analysis. The quantitative approach is considered appropriate because the study aims to empirically test the proposed hypotheses using statistical analysis of numerical data derived from annual reports, sustainability reports, and financial statements. The explanatory research design enables the examination of causal relationships between independent variables (Environmental Disclosure, Social Disclosure, Governance Disclosure, Operational Cost Ratio, and Greenwashing), moderating variable (Tax Aggressiveness), and dependent variable (Market Performance).

3.2 Population and Sample

The population consists of mining companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. The mining sector was selected due to its high environmental sensitivity, significant social impact on local communities, regulatory scrutiny, and increasing investor attention to sustainability practices. Using purposive sampling, the study selected companies that met the following criteria: (1) mining companies consistently listed on the IDX during the 2020–2024 period; (2) companies that published annual reports and sustainability reports consistently during the observation period; (3) companies that provided complete data related to the research variables, including environmental disclosure, social disclosure, governance disclosure, operational cost, greenwashing indicators, tax aggressiveness, and market performance; and (4) companies that had complete financial data for calculating all research variables. Based on these criteria, the final sample includes 18 mining companies observed over five years, resulting in 90 balanced panel observations (18 companies × 5 years).

3.3 Data Collection Techniques

Secondary data were collected from annual reports, sustainability reports, and financial statements of mining companies listed on the Indonesia Stock Exchange during 2020–2024, obtained from the official IDX website (www.idx.co.id) and company

websites. The data collection procedure involved several sequential steps: (1) identification of mining companies listed on the IDX during the 2020–2024 period; (2) selection of companies meeting the predetermined purposive sampling criteria; (3) extraction of environmental, social, and governance disclosure data from sustainability reports using content analysis based on GRI Standards 2021; (4) collection of financial data from audited annual financial statements, including information required for calculating operational cost ratio, greenwashing, tax aggressiveness, firm size, and market performance; and (5) documentation of all extracted data systematically organized into a panel dataset suitable for statistical analysis using EViews 13. The secondary data sources employed in this research are considered reliable as they represent official publications from the Indonesia Stock Exchange and audited financial reports.

3.4 Operational Definition of Variables

Table 1. Operational Definition and Measurement of Variables

Variable	Type	Definition	Measurement	Scale	References
Market Performance (Y)	Dependent	Market performance reflecting investors' perception of the company's performance and future prospects in the market	$PBV = \frac{\text{Market Price per Share}}{\text{Book Value per Share}}$	Ratio	Gillan et al. (2021); Obiedallah & El Mahdy (2025)
Environmental Disclosure (X ₁)	Independent	The extent of corporate environmental information disclosed in annual or sustainability reports	$ED = \frac{\text{Total disclosed environmental items}}{\text{Total environmental disclosure items}}$	Ratio	GRI (2021); Sormin et al. (2026)
Social Disclosure (X ₂)	Independent	The extent of corporate social responsibility disclosure related to social activities and stakeholder engagement	$SD = \frac{\text{Total disclosed social items}}{\text{Total social disclosure items}}$	Ratio	GRI (2021); Wulandari (2026)
Governance Disclosure (X ₃)	Independent	The extent of corporate governance disclosure related to transparency,	$GD = \frac{\text{Total disclosed governance items}}{\text{Total governance}}$	Ratio	GRI (2021); Wulandari et al. (2026)

Variable	Type	Definition	Measurement	Scale	References
		accountability, and governance practices	disclosure items		
Operational Cost Ratio (X_4)	Independent	The firm's operational efficiency in managing operating costs relative to total revenue	$OCR = \frac{\text{Operating Expenses}}{\text{Revenue}}$	Ratio	Lee (2023); Ren et al. (2025)
Greenwashing (X_5)	Independent	Corporate practices aimed at portraying a misleading image of sustainability commitment through CSR disclosure without sufficient substantive environmental actions	$GW = \text{CSR Disclosure Index} - \text{Environmental Cost Ratio}$	Ratio	Huang et al. (2025); Su et al. (2026); Yue et al. (2026)
Tax Aggressiveness (Z)	Moderating	The extent of corporate aggressiveness in minimizing tax expenses through tax planning strategies	$CETR = \frac{\text{Cash taxes paid}}{\text{Pre-tax income}}$	Ratio	Yahaya (2026b)
Firm Size (Control)	Control	The scale of the company representing the firm's resources and operational capacity	$SIZE = \ln(\text{Total Assets})$	Ratio	Abdi et al. (2022); Wulandari & Akbar (2025)

Source: Developed for this research (2026)

Greenwashing reflects a condition in which companies communicate extensive sustainability information without proportional substantive environmental implementation. In recent sustainability literature, greenwashing is commonly associated with the inconsistency between symbolic sustainability disclosure and actual environmental commitment (Huang et al., 2025; Pinto-Gutiérrez et al., 2026; Taddeo et al., 2026; Velte, 2023). Therefore, this study measures greenwashing using the difference

between CSR Disclosure Index based on GRI Standards 2021 and environmental cost. CSR disclosure represents the symbolic dimension of sustainability communication because it reflects the extent to which companies disclose environmental, social, and governance information to stakeholders. Meanwhile, environmental cost reflects substantive sustainability implementation through actual expenditures allocated to environmental management, restoration, waste treatment, reclamation, and other environmental activities. Thus, environmental cost serves as a proxy for the company's real commitment to sustainability practices. The greater the discrepancy between CSR disclosure and environmental cost, the greater the indication that the company emphasizes sustainability image-building more than actual environmental implementation, thereby reflecting stronger greenwashing practices (Su et al., 2026; Wang et al., 2025; Yue et al., 2026).

3.5 Data Analysis Techniques

Data analysis in this study is conducted using panel data regression with the assistance of EViews 13 software. The analysis stages include:

- 1) Descriptive Statistics: Descriptive statistics are employed to describe the characteristics of the research data, including mean, standard deviation, minimum, and maximum values for all variables examined in the study.
- 2) Classical Assumption Tests: Prior to hypothesis testing, classical assumption tests are conducted to ensure that the regression model satisfies the required assumptions so that the estimation results are more reliable. The tests include multicollinearity test using Variance Inflation Factor (VIF), heteroscedasticity test, normality test, and autocorrelation test (Durbin-Watson).
- 3) Panel Data Model Selection: The selection of the appropriate panel data regression model is carried out through three main stages: the Chow Test to compare whether the Common Effect Model (CEM) or Fixed Effect Model (FEM) is the better model to use; the Hausman Test to determine whether the best model is FEM or Random Effect Model (REM); and the Lagrange Multiplier (LM) Test to confirm whether REM is more appropriate than CEM.
- 4) Panel Data Regression Analysis: The regression models used in this study are formulated as follows:

Model 1: Direct Effects Model

$$MP_{it} = \alpha + \beta_1 ED_{it} + \beta_2 SD_{it} + \beta_3 GD_{it} + \beta_4 OCR_{it} + \beta_5 GW_{it} + \beta_6 SIZE_{it} + \varepsilon_{it}$$

Model 2: Moderation Effects Model

$$MP_{it} = \alpha + \beta_1 ED_{it} + \beta_2 SD_{it} + \beta_3 GD_{it} + \beta_4 OCR_{it} + \beta_5 GW_{it} + \beta_6 T_{ait} + \beta_7 SIZE_{it} + \beta_8 (ED_{it} \times T_{ait}) + \beta_9 (SD_{it} \times T_{ait}) + \beta_{10} (GD_{it} \times T_{ait}) + \beta_{11} (OCR_{it} \times T_{ait}) + \beta_{12} (GW_{it} \times T_{ait}) + \varepsilon_{it}$$

Where:

MP = Market Performance (PBV)
 ED = Environmental Disclosure
 SD = Social Disclosure
 GD = Governance Disclosure
 OCR = Operational Cost Ratio
 GW = Greenwashing
 TA = Tax Aggressiveness
 SIZE = Firm Size (Control)
 α = Constant

β_1 – β_{12} = Regression coefficients
 ε = Error term
 i = Company
 t = Year

- 5) Hypothesis Testing: Hypothesis testing is conducted using:
- F-test to examine the simultaneous effect of independent variables on Market Performance;
 - t-test to determine the partial effect of each independent variable on Market Performance;
 - Coefficient of Determination (R^2) to determine the model's ability to explain variations in Market Performance.
 - Moderation testing is conducted using Moderated Regression Analysis (MRA) by examining the significance of the interaction terms between the independent variables and tax aggressiveness. All hypothesis tests are conducted at a significance level of 5% ($p < 0.05$).

4. Results and Discussion

4.1 Results

Table 2. Statistic Descriptive

	Mean	Med	Max	Min	SD	Obs.
MP	1,7693	1,294	10,361	0,255	1,519	90
ED	83,692	85,484	100,000	12,903	14,860	90
SD	77,500	80,556	100,000	44,444	18,046	90
GD	98,815	100,000	100,000	83,333	3,716	90
OE	17,502	12,050	94,183	-13,265	17,587	90
GW	45,432	73,504	100,000	-54,937	103,327	90
SIZE	30,127	30,533	32,758	26,185	1,656	90
TA	0,111	0,223	3,079	-9,685	1,152	90

Source: Data processed by researchers (E-Views 13), 2026.

The descriptive statistics show that the average Market Performance with PBV is 1,769, indicating that, on average, the market values mining companies above their book value. A PBV exceeding one generally reflects favorable market expectations because investors perceive firms as having stronger growth prospects and long-term business sustainability (Brigham & Houston, 2022). Nevertheless, the standard deviation of 1,519 suggests that market valuation differs considerably across companies during the observation period.

The mean Environmental Disclosure (ED) score of 83,692 suggests that most firms have disclosed environmental information at a relatively comprehensive level. This condition indicates increasing corporate attention toward environmental transparency and sustainability-related reporting. Based on GRI Standards, disclosure levels above 75% are commonly associated with relatively extensive sustainability disclosure practices (Global Reporting Initiative, 2021). Similarly, the average Social Disclosure (SD) value of 77,500 indicates that companies have actively communicated information regarding employees, communities, and stakeholder-related responsibilities. Meanwhile, the Governance Disclosure (GD) average of 98,815 reflects a very high level of governance transparency, implying that most firms have broadly disclosed governance-related information and complied with corporate governance expectations.

The average Operational Efficiency (OE) with OCR is 17,502, meaning that operational expenses represent approximately 17,5% of total revenue. Lower OCR values are generally associated with stronger operational efficiency because firms are considered more capable of controlling operational costs relative to generated income (Lee, 2023). However, the relatively large standard deviation indicates uneven operational efficiency among firms within the sample. In addition, the Greenwashing (GW) variable records an average value of 45,432 with a notably high standard deviation of 103,327, suggesting substantial disparities in the consistency between sustainability disclosure and actual sustainability implementation. This pattern implies that while some companies demonstrate more substantive sustainability practices, others may rely more heavily on symbolic sustainability communication (Huang et al., 2025).

Furthermore, the mean SIZE value of 30,127 indicates that most sampled firms can be categorized as large-scale companies based on total assets. Larger firms are typically subject to greater public scrutiny and stakeholder pressure, encouraging broader sustainability disclosure and stronger governance transparency (Gillan et al., 2021). Meanwhile, the average of Tax Aggressive (TA) with CETR value of 0,111 or 11% remains below Indonesia's statutory corporate income tax rate of 22%, indicating the possibility of tax aggressiveness practices among several firms during the observation period (Velte, 2023). The wide range between the minimum and maximum CETR values also reflects considerable differences in corporate tax behavior across companies.

Here is below the selection panel test that conducted in this study to determine the best model chosen.

Table 3. Selection Panel Test

Model	Testing	Prob.	Sig.	Conclusion	Result
1	Chow	0,000	0,050	(0,000<0,050)	FEM
	Hausman	0,936	0,050	(0,936>0,050)	REM
	LM	0,000	0,050	(0,000<0,050)	REM
2	Chow	0,000	0,050	(0,000<0,050)	FEM
	Hausman	0,96	0,050	(0,965>0,050)	REM
	LM	0,000	0,050	(0,000<0,050)	REM

Source: Data processed by researchers (E-Views 13), 2026.

Table 3 shows the model 1 has chosen Random Effect Models based on Hausman and Lagrange Multiplier Test because of the value is not on the significance criteria 0,050. While the model 2 also shows the same situation, Random Effect Model is the best panel model chosen. After the selection panel test conducted, classic assumptions test is needed to ensure that the regression model fulfils the basic statistical assumptions required to have unbiased and reliable estimation results. Therefore, the results of classic assumption tests are presented is follows:

Table 4. Classic Assumption Test

Multicollinearity	MP	ED	SD	GD	OC	GW	SIZE	TA
MP	1,000							
ED	0,053	1,000						
SD	0,001	0,736	1,000					
GD	-0,068	0,296	0,426	1,000				
OC	0,087	0,039	0,012	0,093	1,000			
GW	0,035	0,094	0,017	-0,042	-0,190	1,000		
SIZE	0,002	0,362	0,516	0,100	-0,238	0,170	1,000	
TA	0,082	0,073	0,208	0,006	0,000	-0,043	0,034	1,000

Multicollinearity	MP	ED	SD	GD	OC	GW	SIZE	TA
Heteroscedasticity					0,132			
Normality					0,477			
Autocorrelation					1,966			

Source: Data processed by researchers (E-Views 13), 2026.

Table 4 shows the multicollinearity test results the value under 0,80 which means no correlation between each variable in this regression. The heteroscedasticity test also shows the value above 0,050 (p=0,132), which means that the data in this regression is homogeneous. Normality test also finds 0,477 above the sig. value 0,050 and means that the data in this study unbiased. Then the autocorrelation test shows DW 1,966, it means there is no autocorrelation in this regression.

Based on the classical assumption test results, panel data regression analysis was subsequently conducted to examine the effect of environmental disclosure, social disclosure, governance disclosure, operational cost ratio, and greenwashing on market performance, as well as the moderating role of tax aggressiveness. The regression results are presented in Table 5.

Table 5. Hypothesis Test Results

Variable	Model 1		Model 2		Result
	Coeff.	Prob.	Coeff.	Prob.	
C	-5,522	0,037**	-5,125	0,099	
ED	0,013	0,056*	0,003	0,788	H1 accepted
SD	-0,018	0,048**	-0,014	0,141	H2 accepted
GD	0,002	0,926	0,021	0,363	H3 rejected
OC	0,006	0,099*	0,030	0,000	H4 accepted
GW	-0,002	0,011**	0,002	0,440	H5 accepted
SIZE	0,202	0,003***	0,130	0,074	
TA	0,102	0,060**	-21,654	0,031	
EDTA			0,055	0,136	H6 rejected
SDTA			-0,033	0,023**	H7 accepted
GDTA			0,213	0,019**	H8 accepted
OCTA			-0,056	0,002***	H9 accepted
GWTA			-0,011	0,190	H10 rejected
R Squared	0,914		0,905		
Prob (F-Stat)	0,000		0,000		

Note: Significantly at * p<0,01, ** p<0,05, *** p<0,10

Source: Data processed by researchers (E-Views 13), 2026.

Based on the panel data regression results presented in Table 5, the regression equations of this study can be formulated as follows:

Model 1 Main Effect Model:

$$MP = -5,522 + 0,013ED - 0,018SD + 0,002GD + 0,006OC - 0,002GW + 0,202SIZE + 0,102TA + \varepsilon$$

Model 2 (Moderated Regression Analysis Model)

$$MP = -5,125 + 0,003ED - 0,014SD + 0,021GD + 0,030OC + 0,002GW + 0,130SIZE - 21,654CETR + 0,055(ED*TA) - 0,033(SD*TA) + 0,213(GD*TA) - 0,056(OCR*TA) - 0,011(GW*TA) + \varepsilon$$

Based on the regression results presented in Table 5, this study examines the direct effect of environmental disclosure, social disclosure, governance disclosure, operational cost ratio, and greenwashing on market performance, as well as the moderating role of tax aggressiveness in the relationship between sustainability-related corporate behavior and market valuation. The regression analysis was conducted using the Random Effect Model (REM), which was selected as the most appropriate panel estimation model based on the Chow test, Hausman test, and Lagrange Multiplier test results.

Model 1 explains the direct relationship between the independent variables and market performance, while Model 2 incorporates interaction variables to examine the moderating effect of tax aggressiveness through Moderated Regression Analysis (MRA). The regression results indicate that several sustainability-related variables significantly influence market performance, while the moderating role of tax aggressiveness produces varying effects across the examined relationships. Furthermore, the R-squared values of 0,914 in Model 1 and 0,905 in Model 2 indicate that the regression models have strong explanatory power in explaining variations in market performance among mining companies during the observation period. The probability values of the F-statistic in both models are below 0,05, confirming that the regression models are statistically significant and appropriate for hypothesis testing.

4.2 Discussion

4.2.1 Environmental disclosure affects market performance

The hypothesis testing results indicate that environmental disclosure has a significant positive effect on market performance, with a coefficient value of 0,013 and a probability value of 0,056, indicating that H1 is accepted. This finding suggests that broader environmental disclosure can improve investor perception and market valuation. In the mining sector, environmental transparency is important because mining activities are closely related to environmental risks, pollution, and reclamation obligations. Based on signaling theory, environmental disclosure serves as a signal regarding corporate quality, environmental responsibility, and long-term sustainability commitment (Lu & Sander, 2026). Companies with better environmental disclosure are perceived as more credible and capable of managing environmental risks, thereby strengthening legitimacy and increasing investor confidence (Wulandari, 2026). This finding is consistent with Bamel et al (2025), Dasilas & Karanović, 2025; Demiraj et al., 2025; Yan et al., 2025; Zhang et al (2025), which found that environmental disclosure improves market valuation.

4.2.2 Social disclosure affects market performance

The hypothesis testing results indicate that social disclosure has a significant negative effect on market performance, with a coefficient value of -0,018 and a probability value of 0,048, indicating that H2 is accepted. This finding suggests that broader social disclosure tends to reduce market performance. In the mining sector, social disclosure is closely associated with labor welfare, occupational safety, community relations, and social conflict issues. Based on legitimacy theory, companies disclose social information to gain social acceptance and demonstrate alignment with stakeholder expectations. However, investors may perceive extensive social disclosure as an indication of higher social risk, greater operational costs, or symbolic sustainability communication without substantive implementation. Consequently, excessive social disclosure may increase investor scepticism regarding the credibility and effectiveness of the company's social responsibility practices, thereby negatively affecting market valuation. This finding

supports Huang et al (2025), Pinto-Gutiérrez et al (2026), Taddeo & Weber (2026), Tian et al (2025), which found that social disclosure does not always receive a positive market response because investors increasingly question whether sustainability disclosure reflects substantive implementation or merely symbolic reputation-building.

4.2.3 Governance disclosure affects market performance

The hypothesis testing results indicate that governance disclosure does not affect market performance, with a coefficient value of 0,002 and a probability value of 0,926, indicating that H3 is rejected. This finding suggests that governance disclosure is not considered a major factor influencing investor valuation in mining companies. Although governance disclosure reflects corporate transparency regarding supervisory mechanisms, risk control, and management accountability, investors may perceive governance disclosure as merely regulatory compliance rather than evidence of substantive governance quality. In the mining sector, investors may place greater emphasis on financial performance, operational stability, and sustainability implementation rather than governance disclosure alone. Consequently, broader governance disclosure does not necessarily strengthen investor confidence or improve market valuation, so this finding supports Dkhili (2024), Pinto-Gutiérrez et al (2026), Su et al (2026).

4.2.4 Operational Cost Ratio affects market performance

The hypothesis testing results indicate that operational efficiency positively affects market performance, with a coefficient value of 0,006 and a probability value of 0,099, indicating that H4 is accepted. This finding suggests that companies with better operational efficiency tend to achieve higher market valuation. Efficient operational cost management reflects the company's ability to control costs, maintain operational stability, and improve financial flexibility. Based on stakeholder theory, operational efficiency signals strong managerial quality and the company's capability to maintain long-term business sustainability. Investors tend to perceive efficient companies as more stable, competitive, and capable of generating sustainable profits, thereby improving market performance. This finding is consistent with Abbas & Nainggolan (2023), Gazilas & Vozikis (2024), Lee (2023), Maina & Florence (2024), Olaiya & Alao (2025), Ren et al (2025) which found that operational efficiency positively influences market performance through improved cost management and operational stability.

4.2.5 Greenwashing affects market performance

The hypothesis testing results indicate that greenwashing negatively affects market performance, with a coefficient value of -0,002 and a probability value of 0,011, indicating that H5 is accepted. This finding suggests that higher greenwashing practices tend to reduce investor confidence and market valuation. Greenwashing reflects inconsistencies between sustainability disclosure and actual corporate practices, causing investors to perceive sustainability communication as symbolic efforts aimed at maintaining legitimacy rather than substantive sustainability commitment. Based on signalling theory, investors increasingly evaluate the credibility of sustainability disclosure in assessing corporate quality and long-term prospects. Consequently, higher perceptions of greenwashing can increase reputational risk and weaken market trust. This finding supports (Huang et al., 2025; Luhglatno et al., 2026; Pinto-Gutiérrez et al., 2026; Su et al., 2026; Taddeo & Weber, 2026; Wang et al., 2026) which found that

greenwashing negatively affects market performance because investors become more sceptical toward sustainability disclosure credibility.

4.2.6 Tax aggressiveness moderates the relationship between environmental disclosure and market performance

The hypothesis testing results indicate that tax aggressiveness does not moderate the effect of environmental disclosure on market performance, with a coefficient value of 0,055 and a probability value of 0,136, indicating that H6 is rejected. This finding suggests that investors continue to consider environmental disclosure as an important sustainability signal regardless of the company's tax behavior. In the mining sector, environmental transparency remains relevant because investors are highly concerned with environmental risk management, reclamation obligations, and sustainability commitment. Consequently, tax aggressiveness does not significantly alter investor responses toward environmental disclosure and indicate that environmental disclosure may still be perceived as having independent informational value in shaping market valuation. This finding is in line with Pinto-Gutiérrez et al (2026), Taddeo & Weber (2026), Wang et al (2025), Yue et al (2026)

4.2.7 Tax aggressiveness moderates the relationship between social disclosure and market performance

The hypothesis testing results indicate that tax aggressiveness moderates the effect of social disclosure on market performance, with a coefficient value of -0,033 and a probability value of 0,023, indicating that H7 is accepted. This finding suggests that higher tax aggressiveness strengthens the negative effect of social disclosure on market performance. Investors may perceive inconsistency when companies actively disclose social responsibility information while simultaneously engaging in aggressive tax practices. Such conditions can reduce the credibility of social disclosure and increase investor skepticism regarding the company's genuine commitment to stakeholders. This finding by Jibril & Dikko (2025), Putri et al (2026), Toly et al (2026), Velte (2023), Yahaya (2026), which found that investors increasingly evaluate consistency between sustainability disclosure and corporate financial behavior when assessing corporate credibility.

4.2.8 Tax aggressiveness moderates the relationship between governance disclosure and market performance

The hypothesis testing results indicate that tax aggressiveness moderates the effect of governance disclosure on market performance, with a coefficient value of 0,213 and a probability value of 0,019, indicating that H8 is accepted. This finding suggests that governance disclosure becomes more relevant in influencing market performance when companies exhibit higher tax aggressiveness. Investors may perceive strong governance disclosure as a mechanism that can reduce concerns regarding opportunistic financial behavior and improve confidence in corporate monitoring systems. Consequently, governance transparency may strengthen market trust despite aggressive tax practices. This finding is consistent with Hasan et al (2023), Jibril & Dikko (2025), Putri et al (2026), Velte (2023), Yahaya (2026) which found that governance quality and transparency influence stakeholder perceptions regarding corporate credibility and managerial accountability.

4.2.9 Tax aggressiveness moderates the relationship between Operational Cost Ratio and market performance

The hypothesis testing results indicate that tax aggressiveness moderates the effect of operational efficiency on market performance, with a coefficient value of -0,056 and a probability value of 0,002, indicating that H9 is accepted. This finding suggests that higher tax aggressiveness weakens the positive effect of operational efficiency on market performance. Although operational efficiency generally signals strong cost control and managerial capability, investors may question whether such efficiency results from genuine operational effectiveness or opportunistic financial strategies associated with aggressive tax behavior. As a result, tax aggressiveness can reduce investor confidence in the sustainability of operational performance. This finding supports Hasan et al (2023), Jibril & Dikko (2025), Putri et al (2026), Toly et al (2026), Velte (2023), which argued that investors increasingly assess consistency between operational performance, sustainability practices, and corporate financial behavior.

4.2.10 Tax aggressiveness moderates the relationship between greenwashing and market performance

The hypothesis testing results indicate that tax aggressiveness does not moderate the effect of greenwashing on market performance, with a coefficient value of -0,011 and a probability value of 0,190, indicating that H10 is rejected. This finding suggests that investors already perceive greenwashing negatively regardless of the company's tax aggressiveness level. In other words, inconsistencies between sustainability disclosure and actual corporate practices are sufficient to reduce investor confidence without additional influence from aggressive tax behavior. Consequently, tax aggressiveness does not significantly strengthen or weaken the relationship between greenwashing and market performance. This finding differs from Huang et al (2025), Pinto-Gutiérrez et al (2026), Su et al (2026), Taddeo & Weber (2026), Wang et al (2025), Yue et al (2026), which argued that tax aggressiveness may strengthen investor skepticism toward greenwashing practices. However, the results indicate that investors independently evaluate greenwashing as a reputational risk capable of directly affecting market valuation.

5. Conclusion

This study examines the influence of environmental disclosure, social disclosure, governance disclosure, operational cost ratio, and greenwashing on market performance, with tax aggressiveness as a moderating variable, in mining companies listed on the Indonesia Stock Exchange during the 2020–2024 period. Using panel data regression with the Random Effect Model (REM) on 18 mining companies with 90 observations, the results show that environmental disclosure has a positive and significant effect on market performance, indicating that investors value environmental transparency as a signal of corporate quality and long-term sustainability commitment. Social disclosure has a negative and significant effect on market performance, suggesting that investors perceive extensive social reporting as symbolic communication rather than substantive implementation. Governance disclosure does not significantly influence market performance, implying that governance reporting is still viewed as formal compliance rather than a determinant of firm value. Operational cost ratio has a positive and significant effect on market performance, confirming that operational efficiency enhances market valuation. Greenwashing has a negative and significant effect on market performance, indicating that investors penalize companies engaged in symbolic

sustainability communication without substantive environmental implementation. Furthermore, tax aggressiveness moderates several relationships. It does not moderate the environmental disclosure-market performance relationship, strengthens the negative effect of social disclosure, strengthens the positive effect of governance disclosure, and weakens the positive effect of operational cost ratio on market performance.

The theoretical implications extend signaling theory, legitimacy theory, stakeholder theory, and agency theory to sustainability reporting in emerging markets. The positive effect of environmental disclosure supports signaling theory, while the negative effect of social disclosure challenges the assumption that all ESG disclosures are uniformly valued. The non-significant effect of governance disclosure indicates it is viewed as formal compliance. The negative effect of greenwashing reinforces legitimacy theory, and the moderating role of tax aggressiveness extends agency theory by showing that corporate ethical behavior shapes investor responses toward sustainability activities.

From a practical perspective, companies should strengthen consistency between sustainability disclosure, operational activities, and actual practices. Mining companies should prioritize substantive environmental implementation over symbolic communication. Management should be cautious about excessive social disclosure that may be perceived as greenwashing. Companies should improve operational efficiency and align tax behavior with sustainability commitments. Regulators should improve supervision of ESG disclosure quality and greenwashing practices, develop more stringent sustainability reporting guidelines, and implement monitoring mechanisms to detect greenwashing. Investors should consider consistency between sustainability communication and actual corporate practices, including tax behavior.

This study has several limitations. First, the analysis is limited to the mining sector, restricting generalizability. Second, the five-year observation period may not capture longer-term trends. Third, the study excludes other potential determinants such as profitability, leverage, and macroeconomic conditions. Fourth, greenwashing measurement using the difference between CSR disclosure and environmental cost may not fully capture greenwashing complexity. Fifth, the small sample size of 18 companies limits statistical power. Sixth, CETR may not fully capture tax planning strategies.

Future research should broaden the scope to other sectors or cross-country comparisons, integrate additional variables such as profitability and macroeconomic conditions, employ longer observation periods, examine other moderating variables such as corporate governance quality and regulatory environment, and utilize qualitative approaches to provide richer insights into mechanisms through which sustainability practices influence investor perceptions and market valuation.

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