

Environmental, social, and governance performance in tax avoidance: Evidence from Indonesia's mining and energy sector

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ABSTRACT

This study aims to analyze the relationship between Environmental, Social, and Governance (ESG) performance and tax avoidance of listed companies in the mining and energy sector in Indonesia, a topic that has been rarely explored in emerging economies, including in the extractive industries with high risk. To fill this gap, quantitative method is adopted through the use of the panel data of 32 publicly listed companies for the period 2018-2022. Multiple regression with a number of firm-level controls, such as firm size (SIZE), firm age (AGE), free cash flow (CASH), asset to income ratio (AIN), return on assets (ROA), leverage (LEV) and ownership concentration (TOP) and the tax avoidance proxy effective tax rate (ETR) is employed. The findings show that ESG performance is strongly related with ETR, where the higher ESG scores the company, the lower the ETR. Among the control variables, ROA, CASH, AIN, AGE and TOP have significant effects on tax outcomes while SIZE and LEV show no significant effects. This result likely shows how industry-specific factors shape financing decisions, especially given how similar mining and energy firms tend to be. Also, firms with higher ESG scores tend to have a more robust internal system and more resources, which could enable them to better manage their tax strategy in a way that is within legal boundaries and keeps stakeholders trust.

JEL Code:

G34, H26, M14, Q56

DOI:

10.31106/jema.v23i1.24112

Article History:

Received 2025-08-08

Reviewed 2025-10-04

Revised 2025-12-08

Accepted 2025-12-31

Licensed:

CC-BY

How to Cite:

Astuti, S., Diana, N., Sunaryo, K., Sandy, I. K., Yuliana, D. A., & Susanto, H. (2026).

Environmental, social, and governance performance in tax avoidance: Evidence from Indonesia's mining and energy sector. *JEMA: Jurnal Ilmiah Bidang Akuntansi dan Manajemen*, 23(1), 1-22. doi: 10.31106/jema.v23i1.24112

Keywords: ESG; Tax Avoidance; Effective Tax Rate; Corporate Governance; Mining; Energy

Introduction

Tax is a mandatory contribution to the State owed by people or entities without direct compensation, coercive under the Law, and for State needs to provide welfare to the people as stipulated in Law Number 16 of 2009. The duty to pay taxes according to the law is a duty that each economic entity has to fulfill. Tax liability, however, will lead to cash outflows, and companies may be tempted to avoid taxes to reduce liquidity and boost the value of their shareholders. The problem of corporate tax avoidance is widespread globally and has been observed in different jurisdictions. Hanlon and Heitzman (2010) point out that tax avoidance is a strategy that is driven by information asymmetry, incentives and governance. Renn and Walker (2008) estimate that aggressive tax planning and base erosion cost governments USD 100–240 billion per year, or 4-10% of the global income tax revenues received by governments on corporate income. The tax gap in Indonesia in 2022 was reported to be Rp. 500 trillion, indicating that there is a high level of underreporting and avoidance by corporate taxpayers. The country's ongoing deficit is especially troubling in industries with high risks, like mining and energy, where regulatory complexity and high levels of volatility in profit-making can make it easy for companies to find the incentive to pursue aggressive tax strategies. Additionally, the characteristics of the corporate governance and the Chief Executive Officer (CEO) are important for affecting the tax behavior, as noted by Armstrong et al. (2015), which further underscores the importance of exploring the role of Environmental, Social, and Governance (ESG) performance as a potential mitigating factor.

The performance of Corporate Social Responsibility (CSR) is closely connected to Corporate Tax Avoidance (CTA) and the findings of this research are still debatable (Lanis & Richardson, 2015). The more active companies are in their social responsibilities, the less they will engage in tax avoidance. Moreover, the climate change and environmental problems are getting more severe and global issues, so that the economic, social and environmental effects must be taken into account in the decision making. ESG was first introduced by the United Nations Environment Program in 2004. A good ESG performance can mitigate information asymmetry between companies and stakeholders. Improved ESG performance can lead to reduced corporate financing costs as it enhances investor and creditor confidence, and helps to mitigate environmental and social risks that may impact the viability of a company's loan or investment (Baker et al., 2021). The positive impacts of good ESG performance on a company's financial performance can be seen in information asymmetry,

risk management, supplier and financing relationships, stakeholder reputation and trust (Chen & Xie, 2022a; Dwimayanti et al, 2023).

With a greater focus on sustainable development, corporate priorities have been shifted, encouraging companies to embrace the principles of ESG and prioritize the balance between economic and social values. This transformation impacts strategic decisions, such as tax planning actions. Despite the vast number of studies on ESG, few research efforts have specifically focused on the role of ESG research in corporate tax avoidance practice, which is based on the cost-benefit analysis and which has become a part of the managerial strategy (Muñoz et al., 2022; Xiang et al., 2023). The study of the relationship between tax avoidance and ESG performance provides a valuable insight into the overall economic impacts of sustainable governance, an issue that is crucial in the context of a loss of national revenue and a misallocation of resources from tax avoidance. To date, however, empirical research on the energy and mining industry in Indonesia is still limited and does not yet provide an understanding of the impact of ESG performance on tax avoidance behavior in this sector, which is considered high risk.

Taxation is another major source of income for governments across the board, particularly in industries such as mining and energy, where the dangers of environmental impacts and regulatory complexity make corporate fiscal conduct a high stakes game. The sectors are frequently linked to aggressive tax planning, and are important areas to focus on for sustainability-oriented governance reforms. With the spread of ESG concepts across the world, how these concepts could influence strategic decision-making, such as tax ethics, is now a centre of focus for scholars and policymakers. Although ESG is typically linked to the ethical dimension of tax behavior, Hoi et al. (2013) pointed out that firms can undertake 'irresponsible CSR' in order to mask aggressive tax practices, which highlights the importance of 'ESG credibility' and the scrutiny of stakeholders.

Corporate compliance is a major source of fiscal dependency in Indonesia, as over 80% of the state's revenue comes from taxes. Although Indonesia is the 24th largest oil producer in the world with oil production of 692,000 barrels per day (according to Statistical Review 2022), the implementation of Oil and Gas Income Tax (PPh Migas) in 2019 has not been optimal. Furthermore, the drop in tax revenues from the mining and quarrying industry was significant, from IDR 123 trillion in 2020 to IDR 69.55 trillion (Bisnis Indonesia, 2022). The statistics are testament to the need to tackle tax avoidance in Indonesia's energy industry. Hence, this study will focus on exploring the effect of ESG performance and its mechanisms on tax avoidance of energy firms in Indonesia.

Literature Review

Corporate tax avoidance is a conscious choice that depends on a company's financial health, management, and risk of external review. ESG performance has become a multi-dimensional driver, which can change these drivers and thereby discourage aggressive tax conduct. Liquidity pressures can also influence tax avoidance, as businesses try to reduce the amount of taxes that they pay out, in order to keep cash in hand (Edwards et al., 2016). ESG performance can, however, mitigate financing constraints by improving a company's transparency and reputation. Bae et al. (2018) demonstrate that firms with high ESG ratings have better access to trade credit and cheaper debt financing costs due to the trust they provide to stakeholders. Luo et al. (2023) also find that ESG promotes supplier relationships and lowers financing risk premiums. This is supported by Syahputri (2025) who finds that for financially constrained firms in ASEAN, environmental, social, and governance (ESG) performance has a significant impact in reducing tax avoidance. Likewise, Van et al. (2025) show that ESG transparency lowers tax aggressiveness among Vietnamese companies, providing a buffer against tax aggressiveness in emerging markets.

In the context of agency theory, tax avoidance can be explained as a result of management opportunism, especially when there are low quality internal controls (Desai & Dharmapala, 2006). The ESG performance can reinforce the internal control system, particularly for governance aspects. Armstrong et al. (2015) highlight the importance of transparency in corporate governance and the establishment of independent audit committees in minimizing unethical tax behaviour. ESG disclosures are intended to yield non-financial information to enable stakeholders to track internal operations. This is reinforced by Baker et al. (2021) who demonstrate that the link between ownership structure and tax avoidance is moderated by ESG. Hasan et al. (2021) also agree with this view by stating that ESG disclosure improves the transparency of governance which has a direct negative impact on tax aggressiveness.

If a company has a good ESG score, they will be the company that will be talked about in the first place, and the one that the authorities will be talking about, which raises the reputational risks of a company that carries out aggressive tax. Social capital, as conceptualized by Pástor et al (2021), can be used as a reputational constraint on tax aggressiveness, which further emphasizes the importance of ESG in the determination of ethical corporate action. Analyst coverage leads to the reduction of information asymmetry

and makes tax positions public (Allen et al., 2016; Chen & Lin, 2017). The transparency of ESG reduces the information gathering cost and makes company performance easier for analysts to assess (Zhang et al., 2023). Carolina et al. (2023) provide evidence that tax avoidance and corporate risk have a negative relationship, moderated by ESG performance. Widiastutik et al. (2024) discovered a negative relationship between ESG and earnings management and tax avoidance. Alazzani et al. (2021) argue that the link between sustainability reporting and tax avoidance is negative, which further emphasizes the functions of ESG in improving external monitoring in GCC countries. Similarly, Alsmady (2022) observes that companies in South Asia with good ESG scores take more ethical decisions regarding tax planning, further confirming the link between ESG and reputational discipline.

Firm-specific factors have had a significant impact on tax planning strategies in empirical tax research on corporate tax behavior. To isolate the impact of the ESG characteristics from the other factors that can affect the relationship between ESG performance and tax avoidance in the energy sector, this study introduces seven control factors that represent the economic incentives and government conditions that are widely reported to affect corporate tax planning decisions and that could bias the findings of this study in Indonesia. The purpose of these controls is to control for possible heteroscedasticity in tax planning and increase the strength of the relationship between ESG and tax avoidance (Armstrong et al., 2015; Hanlon & Heitzman, 2010).

Firm size (SIZE) and firm age (AGE) are included because they are basic characteristics of a firm that are often associated with tax behavior, and return on assets (ROA) is included because it is a measure of firm profitability that is often correlated with tax behavior. The link between monitoring and tax avoidance may be theoretically possible and empirically significant, and greater profitability is likely to increase the expected tax burden for more profitable firms, as well as their reputation risk from monitoring and their ability and motivation to plan taxable income (Armstrong et al., 2015; Hanlon & Heitzman, 2010). Firm size also involves two channels, larger firms are more recognized to the regulators and consumers, which may lead to more restrictive positions in tax negotiations, and larger firms also have more resources to develop sophisticated tax strategies, so the overall impact is a matter of empirical fact as analyzed by Hanlon and Heitzman (2010). Firm age reflects organizational maturity, and older firms tend to have more mature internal controls, routines and relationships with key constituencies that can have a disciplining effect on tax behavior, but accumulated experience can also provide firms with a basis to optimize their tax behavior (Alsmady, 2022).

Tax planning incentives are also influenced by factors like asset intensity, leverage, liquidity, and ownership structure, especially in an environment where the business is capital-intensive and is run in an emerging market. Effective tax rates are also influenced by asset intensity which can be measured as asset-to-income ratio (AIN), because asset intensity impacts depreciation allowances and investment-related tax shields, both of which can mechanically reduce effective tax rates, and which can interact with firms' incentives to plan their taxes (Syahputri, 2025). Leverage (LEV) can affect tax outcomes via interest deductibility, and may be used in lieu of other types of tax planning; the link between LEV and other tax-motivating financial constraints and risk-taking incentives may lead to co-movement (Armstrong et al., 2015). Free cash flow (CASH) conditions also indicate the liquidity conditions and the urge to hold cash by minimizing taxes; cash flow effect arguments (Edwards et al., 2016) support that firms with better internal cash generation have less need for aggressive tax avoidance. Majority ownership (TOP) measures governance and agency issues, with concentrated ownership being generally linked to increased monitoring, but also to the existence of private benefits, such as tax planning, by the dominant owners depending on governance quality and the protection of minority shareholders (Coelho et al., 2023). These controls are chosen because they are some of the most common determinants used in tax avoidance research, are directly connected to agency incentives and fiscal capacity, and are easily available across the sample to avoid the risk of multicollinearity and to maintain statistical power, without sacrificing the explanatory power of the model.

Cash Flow Effect Theory: ESG as a Liquidity Buffer

The cash flow effect theory suggests that companies may undertake tax avoidance strategies to minimize cash outflows, this is especially true when facing financial constraints (Edwards et al., 2016). The savings on tax can be channeled back for income or otherwise to the company's operations or to the shareholders. This incentive, however, can be reduced through ESG performance by providing better access to external financing. Investors and creditors view firms with high ESG scores as having low risk, leading to lower borrowing costs and increased credit availability (Luo et al., 2023; Bae et al., 2018). This reputation capital function as a liquidity buffer, reducing the need to engage in tax avoidance.

In the empirical research studies, several previous studies support this mechanism, including Syahputri (2025) and Van et al. (2025), which found that, among financially constrained firms in ASEAN, transparency in ESG terms significantly decreases tax

aggressiveness. Few studies were done within a specific context of resource-intensive sectors, although the majority of these studies were conducted in larger corporate samples. This financing model is under-researched in Indonesia, where tax revenues in the energy sector are shrinking and scrutiny is increasing on the ESG aspects.

Agency Theory: ESG as a Governance Safeguard

Tax avoidance is explained by agency theory as a possible scenario of agency conflict between the management (the agents) and the shareholders (the principals). Short-term managerial incentives and the pressure to elevate corporate performance frequently drive executives toward aggressive tax strategies, despite the looming threat of legal or reputational damage down the road (Desai & Dharmapala, 2006). Fuelling this managerial opportunism are weak internal oversight frameworks and a distinct lack of boardroom transparency. To tackle these corporate friction points, deploying a rigorous ESG framework—specifically the structural governance factor—serves as an indispensable protective barrier. This setup works through independent boards, transparent reporting tracks, and rigorous audit systems that firmly bind executive mandates directly to stakeholder interests. ESG disclosures will raise the visibility of corporate actions, which will help shareholders, analysts and regulators to identify and discourage bad corporate practices and tax avoidance. Furthermore, the study by Agustini et al. (2023) and Coelho et al. (2023) demonstrates that ESG disclosure increases the transparency of governance and decreases tax aggressiveness. But the results are predominantly from developed countries or from varied industries. The governance challenges in Indonesia's energy industry, characterized by state involvement, environmental risks, and regulatory opacity, require targeted investigation.

Agency Theory & Reputational Cost

The companies that perform well on ESG principles are becoming more prominent in analyst, investors and regulators' eyes, which places a reputational premium on tax avoidance companies. Analysts limit information asymmetry and bring tax exposure under the spotlight (Allen et al., 2016; Chen & Lin, 2017). ESG transparency reduces information acquisition costs and facilitates external parties to assess the corporate actions (Zhang et al., 2023).

Carolina et al. (2023) found that ESG reduces the risk effect of tax avoidance. However, Syahputri (2025) found that the correlation of ESG and earnings management as well as tax avoidance were negative. Tashkandi (2022) revealed that the sustainability reporting is negatively related to tax avoidance in GCC countries. Alsmady (2022) also found similar

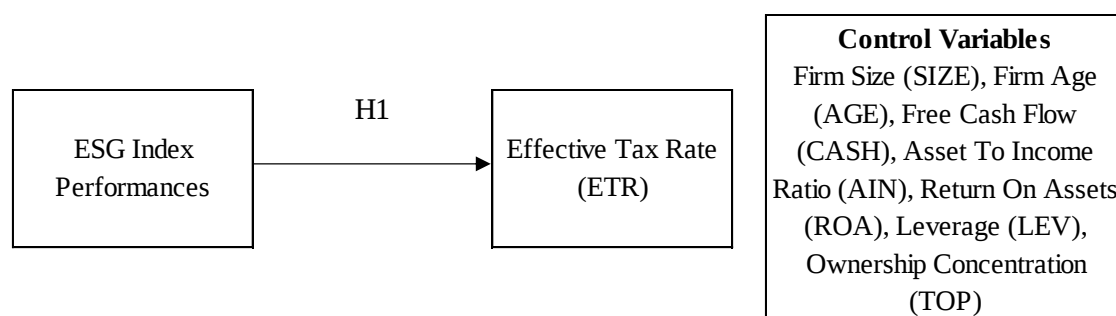
trends in South Asia. However, these studies show differences in the regulatory setting and culture. This context has not been fully explored in the context of the energy sector in Indonesia which has a strategic position and is very volatile in terms of the budget.

Although this is a growing field, previous studies have found some inconsistencies between regions and sectors with regard to ESG and tax ethics. Economies with better market maturity tend to exhibit better ESG-tax avoidance correlations, whereas markets in the emerging economies exhibit more mixed results. Furthermore, most studies ignore resource intensive industries such as energy, in which environmental risk and fiscal opacity increases the incentives of tax behavior.

This trend is particularly worrisome in Indonesia, where energy sector revenues serve as a major gross domestic product (GDP) driver despite a recent, sharp decline in industry tax yields. To confront this paradox, our study evaluates the link between ESG metrics and tax avoidance behavior within the Indonesian energy landscape. This analysis offers timely, actionable insights for regulators, corporate directors, institutional investors, and policymakers—critically clarifying the intersection of corporate sustainability and tax strategies. Figure 1 illustrates the proposed relationship between the ESG performance and the corporate tax avoidance. ESG performance is a measure of how well companies are engaging in their environmental, social, and governance (ESG) business practices. The ETR is the dependent variable in the model for corporate tax avoidance. The framework suggests that there is a relationship between ESG performance and tax-related decisions and reporting of firms. Several control variables are added to the model to reflect the fact that the firm level attributes might be different and influence tax outcomes: SIZE, AGE, CASH, AIN, ROA, LEV, and TOP. The research hypothesis is as follows based on the theory above:

H₁: There is a negative relationship between ESG performance and corporate tax avoidance.

Figure 1. Research Framework



Methods

The initial population for this study comprises all energy companies listed on the Indonesia Stock Exchange (IDX) between 2018 and 2022. A purposive sampling approach was employed to obtain firms that met the requirements of the study. The use of purposive sampling offers several advantages, including greater analytical rigor, improved data integrity, and the ability to focus on firms with complete and relevant information. These advantages are particularly important for examining the relationship between ESG performance and tax behavior, where incomplete disclosure and missing data may affect the reliability of the findings.

Furthermore, the selection of the companies was based on several criteria. First, the companies were expected to make the financial reports and ESG disclosures regularly over the 2018 - 2022 time frame. Second, they had to provide comprehensive information on Effective Tax Rate (ETR), ESG scores and control variables, including Return on Assets (ROA), Free Cash Flow (CASH), Firm Size (SIZE), Asset to Income Ratio (AIN), Firm Age (AGE), Leverage (LEV), and Majority Ownership (TOP). In response to these criteria, companies that were considered not to have disclosed ESG information and financial data were excluded, leaving 32 companies in the final sample. This study applied multiple regression analysis to analyze the correlation between corporate tax avoidance and ESG performance using panel data consisting of 160 firm-year observations (32 companies $\times$ 5 years).

The data used in this study were: (1) The ESG index data from the sustainability reports of every sample company in the observation period; (2) The financial statement data from each sample company, which were audited; (3) The stock price data from Yahoo Finance in the observation period. This study used the panel regression model with the data of 32 energy companies listed on the Indonesia Stock Exchange from 2018 to 2022. The dependent variable was Effective Tax Rate (ETR), which is defined as the ratio of income tax expense to pre-tax accounting income. The level of quality of the internal information environment of a firm has significant impact on tax behavior, thus justifying the use of ETR as a proxy for tax avoidance and ESG scores as indicators of the transparency of the governance system (Gallemore & Labro, 2015). A lower ETR also suggests that tax behavior is more aggressive (Hanlon & Heitzman, 2010). The main independent variable was the ESG Index, which is based on standardized environmental, social, and governance disclosure scores. ESG performance reflects a company's commitment to sustainability, transparency, and sound

governance practices (Bae et al., 2018; Baker et al., 2021). The proposed research model is shown below:

$$ETR = \alpha + \beta_1 ESG + \beta_2 ROA + \beta_3 SIZE + \beta_4 AIN + \beta_5 AGE + \beta_6 LEV + \beta_7 CASH + \beta_8 TOP + \varepsilon$$

where ETR is the effective tax rate, ESG is ESG performance, ROA is return on assets, SIZE is firm size, AIN is asset intensity, AGE is firm age, LEV is leverage, CASH is free cash flow, TOP is ownership concentration, α is the intercept, β represents the regression coefficients, and ε is the error term.

The seven control variables were chosen because they were the most frequently cited determinants of corporate tax avoidance in the corporate tax avoidance literature, available for all firms in the sample period, and were not too numerous to over-parameterize the model but were sufficiently comprehensive to capture the financial capacity and governance incentives of firms. The selection of other potential controls (such as market competition, industry factors and macroeconomic shocks) was not included in the final specification, as they would not have been comparable across firms and would have reduced the number of degrees of freedom otherwise available due to the relatively small panel size, and could have caused multicollinearity. The model contained seven variables to control and analyze the specific financial and governance features of the firm. Firstly, Return on Assets (ROA) is an indicator of profitability and it is calculated by dividing net income by total assets. The higher the ROA, the less likely it is to incentivize tax avoidance because the higher financial performance indicates higher profitability (Armstrong et al., 2015). Secondly, Firm Size (Size) is the operational scale of the firm as measured by the natural log of total assets. Regulatory agencies are likely to be more interested in larger firms, and may take a more conservative approach to taxes. Third, Asset-to-Income Ratio (AIN) refers to the level of capital intensity (total assets / operating income). In asset-intensive companies, a high AIN could signal overly aggressive tax planning, or poor asset utilization (Syahputri, 2025). Fourth, Firm Age (AGE) is the maturity of the organisation, defined as the year that the firm was established minus the current year. Older companies might have more uniform governance and tax procedures (Alsmady, 2022). Fifth, Leverage (LEV) indicates financial risk, which is defined as total debt/total equity. Highly leveraged companies can use tax avoidance to deal with interest commitments and ensure cash flow. Sixth, Free Cash Flow (CASH) is internal liquidity and is defined as cash flow from operations minus capital expenditures. Profitable companies with a lot of cash on hand might not be as motivated to evade taxes (Edwards et al., 2016). Finally, Majority Ownership (TOP) is a dummy variable,

taking the value 1 if the firm has a controlling shareholder, and 0 otherwise. The influence of ownership concentration on tax behavior can be possible via central decision making (Alsmady, 2022).

The baseline estimation was based on a pooled OLS (common-effect) panel regression because the data are panel data (observations are firm-year level across the years 2018-2022). The classical OLS diagnostic tools reported in this study to support unbiased inference were multicollinearity (VIF), heteroscedasticity, serial correlation (Durbin-Watson statistic as a first order diagnostic in pooled residuals), and normality of residuals. Such procedures were widely suggested for pooled OLS/panel settings to guarantee reliable standard errors and hypothesis testing (Gujarati & Porter, 2009; Wooldridge, 2010).

Results and Discussion

This study's population consisted of 32 mining and energy companies that were listed on the Indonesia Stock Exchange in the year 2018 to 2022. Initially, 160 firm-year observations were identified. But 83 observations were excluded due to the inability to consistently obtain necessary ESG and financial information throughout the observation period. This restriction is due to a relatively low level of ESG disclosure by the mining and energy companies in Indonesia, especially at the beginning of the adoption of ESG reporting by companies, where ESG reporting was not compulsory and was not uniformly applied among companies. An extra 15 observations were removed due to their being identified as outliers that could disproportionately affect the regression estimates. Finally, using these selection criteria, the sample included 62 firm-year observations (see Table 1). The number of observations has been reduced to a considerable extent, but the final sample has complete and comparable information on all the variables that are included in the analysis, which increases the reliability of the regression estimates. Furthermore, the data availability issues that arise in emerging-market research are not uncommon, as disclosure processes are less set and formalized in emerging markets. Thus, using a smaller, but complete sample is preferred to keeping observations that contain missing or inconsistent data that can contain measurement error and bias in the empirical results.

Descriptive data of the study variables are presented in Table 2. The mean of the firms' size (SIZE) is 8.66, suggesting that most energy and mining companies in the sample have medium size. The sampled companies are smaller than companies in the energy sector around the world, where companies' asset logarithms are typically higher, which can affect their ESG practices and tax behaviour (Bae et al., 2018). The AGE (firm age) has an average of 26.21

years. The average ESG score, however, is only 0.05, indicating that ESG disclosure remains relatively limited among the sampled firms. This observation differs from prior studies suggesting that older firms are generally associated with more established governance structures and stronger ESG engagement (Alsmady, 2022).

Moreover, Free cash flow (CASH) is an average of 26.70 which means that most of the firms in the sample have large internal cash. The relationship between internal funds availability and financial constraints, as well as its effect on managerial activities and decisions such as tax planning have been supported by prior studies (Edwards et al., 2016). Also, the average value of Asset-to-income ratio (AIN) is 0.23. This means that assets account for about 23% of the income of the sampled firms, on average. The range of values observed is between -0.07 and 10.18, indicating that there is a high variation in asset intensity between companies. This variability could be attributed to differences in the scale of operations, production structure, and use of assets in the mining and energy business in Indonesia.

The sampled firms averaged an effective tax rate (ETR) of 0.02, which means that, on average, they paid around 2% of their pre-tax income in taxes during the period observed. While there is some degree of caution with the use of ETR values, the relatively low average-

Table 1. Sample Selection Process

Sample Selection Criteria	Observations
Initial firm-year observations	160
Less: The data for certain companies is not available for the years 2018-2022	83
Less: The data was removed because it was identified as an outlier	15
Final observations	62

Table 2. Descriptive Statistics

Variables	N	Maximum	Minimum	Mean	Std. Deviation
SIZE	62	4.00	12.00	8.66	1.88
AGE	62	4.00	53.00	26.21	12.00
CASH	62	19.00	31.00	26.70	2.34
AIN	62	-0.07	10.18	0.23	1.35
ESG	62	0.01	0.10	0.05	0.02
ETR	62	-0.34	0.09	0.02	0.05
TOP	62	13.54	79.79	49.37	15.68
ROA	62	-0.83	0.94	0.11	0.34
LEV	62	-0.98	0.98	0.34	0.35

values is in line with previous studies suggesting The opportunities a firm has for tax planning and tax avoidance tend to be greater in industries with greater resource intensity (Hanlon & Heitzman, 2010; Lee, 2025). Ownership concentration (TOP) averages 49.37%, indicating that a substantial proportion of shares is controlled by major shareholders. The minimum and maximum values range from 13.54% to 79.79%, suggesting considerable variation in ownership structures across the sampled firms. The sample firms' ROA average is 0.11, meaning that during the sample period they averaged 11% net income per asset dollar. The standard deviation is relatively large at 0.34 with minimum and maximum values of -0.83 and 0.94 suggesting there are a wide range of profits between firms. Lastly, Leverage (LEV) is 0.34 on average, indicating that debt financing is an important part of the capital structure of companies sampled. The leverage range (-0.98 to 0.98) also illustrates variations in financing choices and financial situations of companies in the mining and energy industry.

Furthermore, to assess the robustness of the regression model, several classical assumption tests were conducted, including tests for multicollinearity, heteroscedasticity, autocorrelation, and normality, as reported in Table 3. The multicollinearity results indicate that all independent variables have tolerance values above the recommended threshold (0.10) and VIF values below 10, suggesting the absence of multicollinearity. The heteroscedasticity test further shows that all variables exhibit significance values greater than 0.05, indicating that the variance of the residuals remains constant across observations. In terms of autocorrelation, the Durbin–Watson statistic of 2.01 falls well within the acceptable threshold, indicating no evidence of first-order autocorrelation. The normality test yields an asymptotic significance value of 0.08, exceeding the conventional threshold of 0.05 and suggesting that the residuals are normally distributed. These diagnostic tests are used together to confirm that the linear regression model appropriate for subsequent analysis.

Table 3. Classical Assumption Results

Variables	Multicollinearity		Heteroscedasticity	Autocorrelation	Normality
	Tolerance	VIF		Durbin Watson	Asymp. Sig.
SIZE	0.29	3.43	0.21	2.01	0.08
LEV	0.78	1.28	0.60		
ROA	0.63	1.60	0.07		
ESG	0.91	1.09	0.32		
AGE	0.87	1.15	0.13		
CASH	0.26	3.80	0.18		
AIN	0.81	1.23	0.05		
TOP	0.88	1.14	0.05		

Table 4. Regression Results

Variables	Predicted Sign	Coefficient (β)	t-value	p-value
Hypothesized Variable				
ESG	(-)	-0.29	-4.73	0.00
Control Variable				
SIZE		0.03	1.55	0.13
LEV		-0.01	-1.07	0.29
ROA		0.01	2.64	0.01
AGE		-0.00	-2.00	0.05
CASH		0.03	2.23	0.03
AIN		0.03	2.03	0.05
TOP		-0.01	-3.32	0.00
F-statistic	12.64 (0.00)			
Adjusted R ²	0.63			

Note: Dependent variable is Effective Tax Rate (ETR). The hypothesis is accepted with p -value < 0.050.

The regression results presented in Table 4 are statistically significant and satisfy all classical assumption tests. ESG performance is statistically significant (-0.290 ; p -value < 0.00) and is negatively related to ETR, indicating that firms with higher ESG scores tend to report lower effective tax rates. Given that a lower ETR reflects more aggressive tax behavior, the findings suggest that firms with stronger ESG performance are more likely to engage in tax avoidance. The analysis also reveals that ROA, CASH, and AIN exhibit positive and significant coefficients, implying that more profitable firms with substantial internal cash resources and higher asset intensity tend to report higher ETRs and therefore lower their levels of tax avoidance. In contrast, AGE and TOP shows a negative and statistically significant effect on ETR at the 5% significance level, suggesting that the older firms and the more concentrated firms with majority ownership of shareholders tend to report lower ETRs and engage in more aggressive tax planning activities. The effects of leverage (LEV) and firm size (SIZE) are not statistically significant. The overall results indicate that observed variables are among the important factors determining the outcome of corporate tax in the energy industry in Indonesia.

This non-aligned (rejected) finding may be due to several reasons. First, the average score of ESG in the sample is very low, which could suggest that ESG disclosure and implementation are still limited, and as such, may not be a reflection of substantive

governance improvements. Second, there is the possibility of some of the reporting on ESG becoming symbolic, which would lead to reputational coverage without actually leading to a decrease in scrutiny by stakeholders of tax practices (i.e., unintended “greenwashing” effects). Third, the regulatory framework and fiscal incentive regimes of the energy sector – including capital allowances and sector-specific tax treatments – may have a greater impact on the ETR result than the agency and reputational-cost arguments, reducing the strength of the compliance channel that is usually assumed by such arguments. These explanations are in line with the idea that both governance and the enforcement of those rules influence corporate tax activities (Desai & Dharmapala, 2006; Hanlon & Heitzman, 2010).

The size of the firm (SIZE) is not statistically significant ($p\text{-value} = 0.13$). Within the Indonesian energy industry, firm size can trigger two opposing signals which can offset each other and influence each other but on a statistically small scale. At the same time, larger companies are likely to be more visible, have more robust reputational risk profiles and be more highly regulated, which can lead to higher motivations for taking 'conservative tax positions' and avoiding tax-related practices that could be the subject of regulatory and public scrutiny. Conversely, larger companies have the potential of higher incentives to take 'conservative tax positions' and avoid practices that might be subject to regulatory or public criticism. This environment generally makes internal control, formal tax governance and external assurance (auditors and compliance systems) more robust and drives firms to higher levels of compliance. However, size also indicates higher organizational capacity, allowing larger firms to employ specialized tax professionals, more sophisticated tax planning systems and to negotiate transactions and project arrangements more efficiently within the legal framework. For a business with capital-intensive operations, intricate contracts and supply chains, the planning capacity can offset compliance pressures with tax timing strategies or structuring that is allowed for. Further, the variance in tax implications across energy sub-segments (upstream vs downstream, regulated vs market-based activities) can be a more important determinant of tax effects than scale effects, meaning that after controlling for ESG, profitability, and governance-related factors, firm size can contribute very little additional explanatory power to the mix. The interpretation of the non-significant result is that in this sector, “being large” is not a sufficient or specific condition of tax effects on the outcomes; it is possible that institutional pressures and governance signals in the sector can have impacts on the outcomes which are greater than the impact of “being large”.

Leverage (LEV) is also not significantly associated with ETR ($p\text{-value} p = 0.29$). A major reason relating to the sector is that capital intensity, project duration and financing

needs are the most important drivers of leverage in energy companies, and do not reflect conscious tax-shield optimisation. In this sector, creditor monitoring and covenants are typically used to reduce any tendency to opportunistic behaviour, and promote conservative reporting and risk management, a feature of debt which helps to reduce the incentive to use debt aggressively to minimise taxes. Furthermore, energy companies often enjoy large non-debt tax shields associated with asset-intensive investment structures (e.g., depreciation-related deductions and investment-related tax treatments) that decrease the incremental tax benefit from extra interest deductions and can weaken the leverage–ETR relationship. Leverage is also influenced by the regulatory and license-to-operate environment; businesses might prefer to adhere to the rules and regulations to ensure that they will have access to funding, licenses, and legitimacy, and thus choose to be a bit more leveraged to suit their investment requirements and risk appetite rather than for tax reasons. Finally, the mechanism from “higher debt” to “lower taxes” can be clouded by the heterogeneous financial conditions (e.g., restructuring pressure or profitability shock) faced by firms in a sample of firms with varying business models. In practice, the result indicates that classic capital-structure tax incentives appear to have a smaller effect than ESG signaling, profitability, and monitoring the governance/ownership in tax outcomes of the energy sector in Indonesia.

The results show that ROA and asset-to-income ratio (AIN) are important predictors of ETR ($p\text{-value} < 0.05$). The coefficient for both variables is positive, indicating that higher profitability and higher asset intensity are associated with lower tax avoidance (higher effective tax rate). This is in line with the approach of higher fixed asset exposure and stronger operating performance resulting in greater "transparency" and lower incentives (or opportunities) to engage in aggressive tax planning (Hanlon & Heitzman, 2010; Armstrong & Fung, 2025). Similarly, there is a positive and significant relationship between free cash flow (CASH) and the firm's need to avoid taxes to maintain cash ($p\text{-value} = 0.03$), suggesting that a firm's internal liquidity reduces pressure to engage in tax avoidance to maintain cash (Edwards et al., 2016). Firms with more concentrated ownership (TOP) are significantly negatively related to ETR ($p\text{-value} = 0.01$), and firms that are older (AGE) have a marginally negative relationship ($p\text{-value} = 0.05$), suggesting that higher tax avoidance is correlated with those who are older and have more concentrated ownership, perhaps because of entrenched decision making and the ability to take advantage of regulatory complexity. Last, SIZE and LEV are not statistically significant, demonstrating that other traditional factors do not clearly and directly influence the relationship between these factors and tax behavior. The

explanatory power of the model, measured by the adjusted R^2 , is still quite high, and all the VIF values are under 10, with no values above 10, which has resulted in no multicollinearity and therefore reliable estimates.

Conclusion and Suggestion

The current research focuses on ESG performance and the linkage between corporate tax performance and the ESG performance in energy companies listed in the Indonesian Stock Exchange (IDX) with the determinant of ETR. The regression results also show that ESG is significant and negatively related to ETR in this regression, confirming the negative correlation between them when ETR is used as an inverse proxy of tax avoidance. Other controls, such as several of those mentioned above (ROA, CASH, AIN, AGE, and TOP), are also important, while other controls (SIZE and LEV) are not. In other words, the importance of profitability, liquidity, capital intensity, maturity, and ownership structure in affecting tax outcomes is highlighted. The results showed that aggressive tax behavior might not be efficiently curtailed solely through ESG disclosure in environments where the implementation of ESG and enforcement is uneven. In the real world, ESG scores need to be measured alongside governance and fiscal transparency mechanisms, not taken for granted to be associated with better tax compliance. These findings also have implications for various stakeholders. For regulators and tax authorities, the results suggest that stronger ESG reporting requirements may improve corporate transparency and reduce aggressive tax behavior. ESG considerations could also be incorporated into fiscal policies through incentives for sustainable business practices, such as tax benefits for green energy investments or recognition programs for firms that demonstrate responsible tax compliance. ESG indicators may also be a proxy for ethical financial practice, including tax transparency, which is a growing concern of investors in risk evaluation and screening. For firms, engaging in ESG initiatives is not only a means of enhancing corporate reputation but also a signal of transparency, accountability, and fiscal responsibility, which can strengthen relationships with stakeholders and regulators while enhancing greater trust in the firm's long-term commitment to sustainable business practices.

Although the study has made significant contributions, it has certain limitations which are worthy of consideration. In the first place, the sample size, that is, the number of energy firms is relatively small (34), and this can affect the generalizability of the results for the sector and region. Second, the observed ESG index has low variation, which is possible because the adoption of sustainability practices is still in the early stages in Indonesia and this

could dampen the moderating effect of ESG. Third, the five-year time window might not be sufficient to observe long-term policy effects and behavior changes in a sector that is subject to regulatory and environmental change. The limitations suggest avenues for future research to broaden the scope to other industries, add longitudinal ESG scoring, and examine other mediating variables like institutional quality, board composition, or international ownership structures. These extensions would help to further understand the contribution ESG can make to corporate fiscal behavior in emerging markets and enrich policy and governance recommendations.

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Conflict of Interest / Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding Statement

This research received no external funding.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Approval Statement

Ethical review and approval were waived for this study because no sensitive personal data were collected.

Disclosure The Use of AI Technologies

During the preparation of this work, the author(s) used artificial intelligence (AI)-assisted tools for language editing, translation, and text refinement. After using these tools, the author(s) carefully reviewed, revised, and verified the content as necessary and take full responsibility for the accuracy, integrity, and final content of the publication.