

THE MODERATING ROLE OF BOARD GENDER DIVERSITY ON THE RELATIONSHIP OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE, CAPITAL INTENSITY TO TAX AVOIDANCE



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Abstract

This research explores corporate tax avoidance (TA) by assessing the roles of capital intensity (CI) and environmental, social, and governance (ESG) performance, while also considering board gender diversity (BGD) as a moderating factor within non-financial firms in ASEAN. The study is based on panel data from 185 companies observed over a five-year timeframe. The empirical evidence demonstrates that ESG engagement is significantly associated with variations in tax avoidance behavior, indicating that firms with stronger ESG commitments tend to adopt distinct tax strategies. Capital intensity is also identified as a key determinant, showing a stable and statistically significant relationship across all estimation models. To enhance analytical rigor, firm-level characteristics such as profitability (ROA), leverage (DER), and company size (FS) are included as control variables. Moreover, the findings reveal that board gender diversity strengthens the interaction between capital intensity and tax avoidance, highlighting the importance of governance structure in shaping corporate tax decisions. The study further observes a notable rise in tax avoidance activities among ASEAN firms during the COVID-19 period, both in immediate and extended horizons. These results underline the urgency for regulators to implement more robust ESG disclosure standards to improve transparency and ensure more effective tax supervision.

INTRODUCTION

Tax avoidance (TA) has emerged as a global concern, as it is widely practiced by multinational corporations such as Google, Amazon, IKEA, Starbucks, and Microsoft (Sumantri, et., al., 2024). Similar practices are also observed among companies operating in the ASEAN region, including Philip Morris and Adaro Energy. At the same time, the economic growth of ASEAN countries has been progressing rapidly and showing strong expansion (Hoang, et., al., 2023). This dynamic growth intensifies competition among firms, encouraging them to adopt various strategic approaches to maintain competitiveness, one of which is reducing tax obligations through tax avoidance practices (Duong & Huang, 2022).

Tax avoidance (TA) often creates a tension between governments and corporations. On one side, governments aim to maximize tax revenues to support public spending, while on the other side, firms attempt to minimize their tax obligations through various legal strategies (Firmansyah & Bahri, 2022). Among the many determinants of TA, this study focuses on two key factors, namely environmental, social, and governance (ESG) performance and capital intensity (CI). Both variables are frequently associated with tax avoidance behavior, as they may provide opportunities for firms to exploit regulatory gaps and reduce their effective tax burden (Yoon, et., al., 2021). From the perspective of legitimacy theory, corporate strategies are considered appropriate when they align with prevailing social norms and expectations (Lukman, 2024). In this context, ESG disclosure serves as a mechanism for firms to demonstrate accountability and gain societal approval. Strong ESG performance is often linked to improved access to financing and investment opportunities, which ultimately supports profitability and business expansion (Inawati & Rahmawati, 2023). Similarly, stakeholder theory emphasizes the importance of transparency in corporate ESG practices. Firms are encouraged to disclose ESG-related information to meet stakeholder expectations and enhance trust (Fuadah, et., al., 2022). By fulfilling these expectations, companies aim to increase firm value and sustain profitability over time (El-Deeb, et., al., 2023). Higher ESG performance can also expand firms' access to diverse funding sources, thereby strengthening their financial position. However, the relationship between ESG and tax avoidance is not straightforward. Some studies suggest that firms with high ESG performance may have greater incentives or opportunities to engage in tax avoidance practices (Zhang, et., al., 2021). This is partly because extensive ESG activities often require substantial costs, which can motivate firms to adopt tax planning strategies to offset these expenses (Sumunar & Djakman, 2020). Consequently, ESG performance may serve not only as an indicator of corporate responsibility but also as a strategic tool that indirectly facilitates tax avoidance.

Investment policies in fixed assets may serve as a strategic channel for firms to minimize tax burdens. This condition is closely associated with capital intensity (CI), where higher levels of fixed asset ownership lead to increased depreciation charges. As depreciation reduces taxable income, firms with greater capital intensity are more likely to benefit from lower tax obligations, thereby creating incentives for tax avoidance behavior (Firmansyah, 2022). The results of previous studies examining how ESG and CI impact TA are shown in Table 1.

Table 1. The result previous research on the effect of ESG and CI on TA

Variable	Country and Researchers	Result
ESG	Binhadab (2025); Yanto et al (2025); Lee (2024); Teja (2024); Duong & Huang (2022); Zhang et al. (2021);	+
	Amarna et al (2025); Sugimin et al. (2024); Jiang et al. (2024); Khlifi et al. (2024); Nurlaely & Dewi (2023); Hidayat & Zuhroh (2023); Yoon et al. (2021)	-
	Mukhtaruddin et al (2025a); Pratiwi & Yunita (2024); Ramadhan & Wadi (2024); Anggraini & Wahyudi (2022);	Na
CI	Yunira et al (2025); Wang et al. (2024); Apriani & Sunarto (2022); Putri et al. (2022); Rahma et al. (2022); Darsani & Sukartha (2021); Muhmad et al. (2020)	+
	Yahya et al (203); Suciarti et al. (2020);	-
	Hapsari (2025); Hendayana et al (2024); Aladwey (2022); Ulfa et al. (2021); Omesi & Appah (2021)	Na
	Zoebar & Miftah (2020)	

Table 1 presents a summary of prior empirical findings regarding the influence of environmental, social, and governance (ESG) performance and capital intensity (CI) on tax avoidance (TA). The evidence reported in previous studies remains mixed and, in many cases, contradictory. Several studies document that ESG performance is positively and significantly associated with tax avoidance, indicating that firms with higher ESG engagement may also exhibit greater involvement in tax minimization strategies. This condition suggests that, despite enhancing corporate reputation and strengthening a firm's public image, ESG activities may coexist with efforts to reduce tax payments, potentially reflecting opportunistic behavior. Conversely, other studies provide opposing results, suggesting that ESG performance does not necessarily constrain tax avoidance and may even be strategically integrated into corporate policies that facilitate such practices. These inconsistencies in empirical findings may stem from various contextual differences. In particular, variations across countries in terms of regulatory frameworks governing ESG disclosure, reporting standards, and enforcement mechanisms can significantly influence corporate behavior. Furthermore, the absence of a universally accepted ESG measurement standard, combined with differences in cultural, economic, and methodological approaches, may contribute to the divergent results observed in prior research (Mukhtaruddin, et., al., 2025).

Empirical studies examining the relationship between capital intensity (CI) and tax avoidance (TA) have produced inconsistent findings. Several studies report a positive and significant relationship, suggesting that higher levels of investment in fixed assets can serve as a strategic means for firms to minimize tax obligations (Apriani & Sunarto, 2022; Wang, et., al., 2024; Yunira, et., al., 2025). This strategy is closely linked to accounting treatments such as depreciation methods, as well as additional costs associated with the maintenance of fixed assets, which can reduce taxable income. In contrast, other studies identify a negative and significant association between CI and TA, indicating that increased investment in fixed assets may lead to higher overall expenses, thereby reducing net income without necessarily reflecting deliberate tax avoidance behavior (Darsani & Sukartha, 2021; Rahma, et., al., 2022). These differing results highlight the complexity of the relationship between capital intensity and tax strategies. The variation in findings may be attributed to several factors, including differences in industrial sectors, time periods of observation, and national tax environments. Each country operates under distinct tax regulations and rates, which can influence how firms utilize capital investment as part of their tax planning strategies.

Given the inconsistent and diverse findings in prior research, this study seeks to further investigate the impact of environmental, social, and governance (ESG) performance and capital intensity (CI) on tax avoidance (TA). To enhance the robustness of the analysis, several control variables are incorporated, including leverage, profitability, and firm size. In addition, this study differentiates itself from earlier research by employing the Book-Tax Difference (BTD) as a proxy for tax avoidance, whereas most previous studies have relied on measures such as the Effective Tax Rate (ETR) and Cash Effective Tax Rate (CETR). The focus on non-financial firms reflects their presence across a broad range of industries within the ASEAN region, including consumer goods, energy, and technology sectors. These industries are particularly relevant due to their close association with both tax avoidance practices and ESG-related issues. Furthermore, this study concentrates on five ASEAN countries, Indonesia, Malaysia, Thailand, Singapore, and the Philippines, selected based on their relatively large market capitalizations compared to other ASEAN members (OECD, 2024). In 2024, the market capitalization of ASEAN countries (in USD billion) demonstrates significant variation, with Indonesia leading at 881.47, followed by Singapore (609.65), Thailand (559.22), Malaysia (445.38), and the Philippines (333.81). In contrast, other ASEAN countries such as Vietnam (217.65), Cambodia (3.20), Myanmar (0.37), and Laos (0.04) show considerably smaller market sizes. These differences further justify the selection of the five countries as the primary focus of this study.

The incorporation of board gender diversity (BGD) as a moderating variable represents a key contribution of this study. Prior literature suggests that female directors are more risk-averse and exhibit greater diligence in decision-making processes. They are also more inclined to prioritize sustainability and ethical considerations, including ESG-related concerns, in corporate strategies. Consequently,

greater gender diversity at the board level is expected to strengthen governance quality and potentially mitigate aggressive tax avoidance behavior.

The results of this study offer valuable implications for policymakers, particularly in monitoring and regulating corporate activities related to ESG practices and fixed asset investments, as these factors influence the level of taxes paid by firms. In this regard, there is a need for clearer policies governing ESG components as well as standardized frameworks for assessing ESG performance. Additionally, appropriate implementation of depreciation methods and the treatment of fixed asset maintenance costs is essential to avoid distortions in reported profits that may lead to reduced tax liabilities. Tax avoidance practices can diminish government tax revenues, thereby constraining the state's ability to finance economic development. Although such practices are generally considered legal, they are often viewed as ethically questionable. Accordingly, this study addresses three main research questions: (1) how ESG performance influences tax avoidance, (2) how capital intensity affects tax avoidance, and (3) how board gender diversity moderates the relationship between ESG, capital intensity, and tax avoidance.

This study is grounded in four underlying theoretical perspectives, one of which is feminist theory. Feminist theory examines gender-based inequalities, particularly the disparities experienced by women in social, economic, and organizational contexts (Larson & Guy, 2024). Rather than positioning itself as opposition to men, feminism seeks to challenge and transform cultural norms and institutional structures that perpetuate discrimination, including those related to family roles and societal expectations. It emphasizes the elimination of oppression and the promotion of equal rights for women as a social group. At its core, feminism aims to achieve gender balance and equitable participation. Within the context of leadership, female leaders are often associated with higher emotional awareness, including a strong understanding of personal values, motivations, and interpersonal dynamics. This emotional intelligence enables them to integrate rational and relational considerations in decision-making processes. Women are also perceived as more transparent and respectful in planning and managerial activities. Furthermore, leadership styles commonly attributed to women tend to emphasize empathy, care, and inclusiveness, which are influenced by nurturing characteristics. Such leadership is often described as democratic, thoughtful, detail-oriented, and oriented toward collaboration and conflict resolution (Guha et al., 2025; Jing et al., 2022). These attributes suggest that greater female representation in leadership positions may contribute positively to organizational governance and decision quality.

The second theoretical foundation employed in this study is agency theory, which explains the relationship between principals and agents (Jensen & Meckling, 1976). In the context of taxation, firms act as agents seeking to maximize profits, while the government assumes the role of principal with the objective of enhancing public welfare through tax collection. A key assumption of agency theory is the existence of information asymmetry, where management possesses more detailed knowledge about the firm's operations compared to external parties, including tax authorities. This imbalance of information can create opportunities for conflicts of interest, particularly in tax-related decisions, thereby increasing the likelihood of firms engaging in tax avoidance practices (Tanujaya, et., al., 2022). Furthermore, agency conflicts arise because the objectives of the principal and agent are not fully aligned. While the government aims to optimize tax revenues, firms tend to minimize their tax obligations to improve financial performance (Anggun, et., al., 2021). This divergence of interests provides a theoretical basis for understanding why companies may adopt tax avoidance strategies.

The third theoretical perspective applied in this study is legitimacy theory, which emphasizes the importance of organizations continuously aligning their operations with prevailing social norms and expectations in order to maintain societal acceptance (Lukman, 2024). To secure legitimacy, firms are expected to demonstrate their commitment to environmental and social responsibilities, thereby gaining public trust and support. One of the primary mechanisms for achieving this legitimacy is through transparent disclosure of environmental, social, and governance (ESG) performance (Zuraida, 2021). Legitimacy theory highlights how organizations respond to societal values and expectations by adjusting their practices and communication strategies (Martens, et., al., 2023; Stephens, et., al., 2025). In this context, ESG performance serves as an indicator of how effectively a company communicates its responsibility toward sustainability-related issues. This study underscores the role of ESG

performance in strengthening corporate legitimacy within society. Firms that demonstrate greater environmental awareness and responsibility are more likely to gain positive recognition and support from stakeholders, thereby reinforcing their social acceptance (Ruan & Liu, 2021).

The fourth theoretical framework employed in this study is stakeholder theory, which explains how a firm's ability to accommodate and balance the interests of various stakeholder groups influences its long-term sustainability and financial performance. According to this theory, all stakeholders who are affected by corporate activities have the right to access information regarding decisions and actions taken by the firm (Freeman, 1984). Within this perspective, ESG performance reflects a company's efforts to integrate social responsibility with economic objectives, thereby reducing potential business risks (Sumunar & Djakman, 2020). Stakeholders contribute to the firm in multiple ways, including through social engagement that enhances corporate reputation, financial participation such as investment, and consumptive behavior through the purchase of products or services. These roles align with the core principles of stakeholder theory, which emphasize the importance of maintaining mutually beneficial relationships between the firm and its stakeholders (El-Deeb, et., al., 2023).

Environmental, social, and governance (ESG) has increasingly been recognized as a comprehensive framework for evaluating corporate sustainability and informing investment decisions (Hapsari, et., al., 2023; Karyani, 2022). Through ESG disclosure, companies communicate their strategies, performance outcomes, and risk management practices based on sustainability-related indicators. This disclosure serves as a mechanism for firms to build credibility and gain stakeholder trust by demonstrating the integration of ESG principles into their overall business operations (Alareeni & Hamdan, 2020). The adoption of ESG practices can generate benefits not only for companies but also for society at large, as it promotes long-term sustainability. Firms are considered sustainable when they are able to pursue profitability without compromising social welfare and environmental integrity (Yudhanto & Simamora, 2023). However, the relationship between ESG and corporate behavior is not always straightforward. Some firms with strong ESG performance may leverage this position strategically to enhance financial outcomes, including engaging in tax avoidance practices to maintain competitiveness (Zhang, et., al., 2021).

However, the relationship between ESG and corporate behavior is not always straightforward. Some firms with strong ESG performance may leverage this position strategically to enhance financial outcomes, including engaging in tax avoidance practices to maintain competitiveness (Zhang, et., al., 2021). The capital intensity (CI) ratio reflects the proportion of a firm's fixed assets relative to its total assets. These fixed assets generate tax advantages primarily through depreciation expenses. The extent of tax reduction depends on the type of assets owned as well as the accounting methods applied in recognizing depreciation (Darsani & Sukartha, 2021). In addition, the CI ratio illustrates the degree to which a company's operations depend on tangible assets, such as machinery, equipment, and production facilities. Firms may utilize these assets strategically as part of their tax planning efforts (Candraniawati, 2023). As the value of fixed assets increases, the associated depreciation expenses also rise, leading to greater opportunities for reducing taxable income and achieving tax savings (Firmansyah & Bahri, 2022; Suardikha, 2019).

In addition, the CI ratio illustrates the degree to which a company's operations depend on tangible assets, such as machinery, equipment, and production facilities. Firms may utilize these assets strategically as part of their tax planning efforts (Candraniawati, 2023). As the value of fixed assets increases, the associated depreciation expenses also rise, leading to greater opportunities for reducing taxable income and achieving tax savings (Firmansyah & Bahri, 2022; Suardikha, 2019). Diversity within a company's board of directors represents an important strategic asset that can enhance competitive advantage. In particular, board gender diversity (BGD) has been found to be positively associated with corporate performance (Isabel, et., al., 2026; Kabir, et., al., 2023; Sahu, et., al., 2025). Since organizational outcomes are closely linked to managerial decisions, diversity in leadership demographics plays a crucial role in shaping effective governance. Such diversity encompasses various dimensions, including age, gender, educational background, nationality, experience, and ethnicity. BGD, as one key aspect of board diversity, influences the dynamics of decision-making, including the presence of task-related disagreements and how these differences contribute to organizational

performance (Sambuaga & Felicia, 2024; Simionescu, et., al., 2021; Van Den Oever & Beerens, 2021; Yami, et., al., 2025). The increasing representation of women in top management positions also reflects broader progress toward gender equality and the reduction of discriminatory practices (Hing, et., al., 2023; Xu, 2024). Furthermore, prior studies indicate that BGD is associated with corporate tax behavior, including tax avoidance (TA). This relationship is often justified from both ethical and economic perspectives, as greater gender diversity may enhance governance quality and influence corporate decision-making processes (Adela, et., al., 2023; Garcia-blandon & Ravenda, 2024; Ruan & Liu, 2021).

Tax avoidance (TA) has become a significant issue due to its potential to reduce government revenue. Although TA is generally considered a rational corporate strategy that generates economic benefits through legitimate business decisions (Ariff, 2023; Kurniawati, 2024), it may still undermine the effectiveness of tax systems. Firms utilize tax avoidance as a lawful approach to minimize their tax obligations by taking advantage of gaps or ambiguities within existing tax regulations (Duhoon & Singh, 2023). Despite being legally permissible, such practices can negatively affect state income, particularly when widely adopted by large corporations. Governments are aware that firms often engage in strategic tax planning to reduce their tax burden (Novriyanti, et., al., 2020). These practices typically involve the use of available tax incentives, such as deductions, exemptions, and flexible interpretations of tax provisions (Stawati, 2020). While tax avoidance operates within the legal framework, it differs fundamentally from illegal tax evasion, as it does not involve direct violations of tax laws (Duhoon & Singh, 2023).

This study develops a theoretical framework to examine how capital intensity (CI) and ESG performance influence tax avoidance, while accounting for several control variables. In this framework, tax avoidance serves as the dependent variable, whereas CI and overall ESG performance are treated as independent variables. Additionally, firm size, profitability, and leverage are incorporated as control variables to provide a more comprehensive analysis of corporate tax behavior.

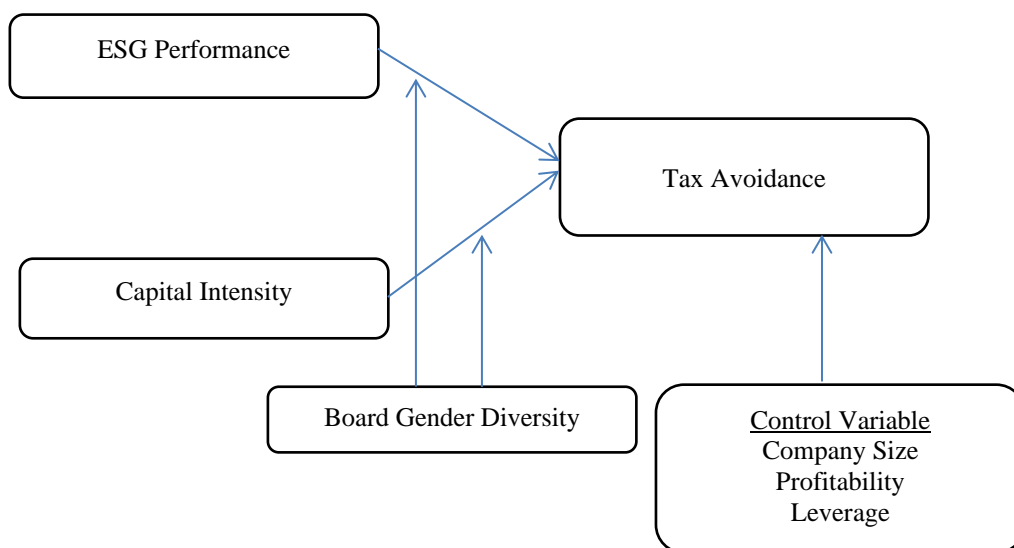


Figure 1. Theoretical Framework

This study proposes three hypotheses, each of which is elaborated in the following sections. Environmental, social, and governance (ESG) performance reflects a firm’s ability to implement its business strategy while creating sustainable long-term value. ESG performance is commonly evaluated using an ESG score, which captures the extent to which a company performs across environmental, social, and governance dimensions (E-Vahdati, et., al., 2022). From the perspectives of stakeholder theory and legitimacy theory, corporate success is not solely determined by financial performance but also by the firm’s ability to meet the expectations of various stakeholders, including investors, customers, and the broader society. The level of stakeholder trust plays a crucial role in ensuring a

firm's continuity and long-term sustainability (Sumunar & Djakman, 2020). In this regard, ESG disclosure serves as a tool to enhance transparency and improve access to external financing. A higher ESG score generally reflects stronger performance in governance practices, social responsibility, and environmental management. However, such performance may also provide firms with greater flexibility in financial decision-making, including the potential to engage in tax avoidance strategies. Empirical evidence from previous studies indicates that ESG performance significantly influences tax avoidance behavior (Duong & Huang, 2022; Nurlaely & Dewi, 2023; Mukhtaruddin, et., al., 2024; Sobhy & Megeid, 2023; Yoon, et., al., 2021; Zhang, et., al., 2021).

Capital intensity (CI) can be utilized by firms as a strategic means to minimize tax obligations. This mechanism arises because investments in fixed assets generate depreciation expenses, which reduce reported earnings and subsequently lower taxable income (Darsani & Sukartha, 2021). Consequently, the total tax payable by the firm decreases. Such practices may conflict with the government's objective of maximizing tax revenues to support public expenditure. From an agency theory perspective, this situation reflects a divergence of interests between the government and firms. While the government seeks to increase tax collection, firms aim to reduce their tax burden, and capital intensity becomes one of the channels through which this objective is achieved. Firms with higher levels of capital intensity tend to benefit from depreciation-related tax advantages, resulting in lower effective tax payments. Prior empirical studies provide evidence that capital intensity significantly influences tax avoidance behavior (Darsani & Sukartha, 2021; Muhmad, et., al., 2020; Putri, et., al., Pandansari, et., al., 2022; Rahma, et., al., 2022; Suciarti, et., al., 2020; Wang, et., al., 2024).

The inclusion of female members on corporate boards contributes to shaping distinctive organizational characteristics. Female leadership is often associated with a more participative and democratic management style, influenced by nurturing and relational traits (Larson & Guy, 2024). This presence encourages firms to adopt more careful and comprehensive approaches in planning and decision-making processes, particularly in areas related to ESG initiatives and fixed asset investments. Decisions concerning ESG activities play a crucial role in determining a firm's long-term sustainability, reputation, and overall performance. Likewise, investment in fixed assets has significant implications for future operational capacity and revenue generation. Ideally, both ESG engagement and capital investment are directed toward sustaining business growth rather than facilitating tax avoidance practices. Furthermore, female leaders are often characterized by strong commitment and persistence in achieving organizational objectives, which may contribute to more responsible and ethically oriented corporate decisions.

The hypotheses proposed in this study are as follows:

- H_1 : ESG performance affects tax avoidance
- H_2 : Capital Intensity Affects Tax Avoidance
- H_{3a} : Board Gender Diversity moderates the relationship between Environmental, Social, and Governance and Tax Avoidance
- H_{3b} : Board Gender Diversity moderates the relationship between Capital Intensity and Tax Avoidance.

METHOD

The population of this study comprises 3,634 non-financial firms listed on stock exchanges in five ASEAN countries, namely Singapore, Indonesia, Malaysia, Thailand, and the Philippines. However, a substantial number of firms (3,449) were excluded due to incomplete ESG data during the 2019–2023 observation period. ESG data prior to 2019 is limited, while data for 2024 has not yet been released. After applying the sampling criteria, a total of 185 companies were selected as the final sample. The distribution of the sample includes 16 firms from Indonesia, 38 from Malaysia, 8 from the Philippines, 50 from Singapore, and 73 from Thailand.

The data used in this study were obtained from Refinitiv Eikon and cover a sample of 185 firms over the 2019–2023 period. The dataset includes all variables required for the analysis, such as net income, ESG scores, fixed assets, total assets, the proportion of female representation in top

management, total debt, and total equity. Detailed definitions of each variable, along with their measurement approaches, are presented in Table 2.

Table 2. Presents the definitions and measurements of the variables

Variable	Definition	Measurement
Tax Avoidance (TA)	A lawful strategy used by firms to reduce tax liabilities by utilizing gaps or flexibility within tax regulations.	BTD = (Accounting income – Fiscal Income)/Total Assets
Environmental, Social, Governance (ESG)	An assessment of a firm’s performance based on disclosures related to environmental, social, and governance aspects.	ESG overall score from LSEG (Refinitiv)
Capital Intensity (CI)	A ratio reflecting the proportion of fixed assets relative to total assets, indicating how effectively assets generate income.	CI = (Fixed Assets/Total Assets)
Board Diversity (BGD)	The proportion of female members on the board compared to the total number of board members.	BGE = (number of women in boards/total number of boards
Firm Size (FS)	The scale of a company as measured by its total assets.	FS = Ln (Total Aset)
Profitability (ROA)	A measure of a firm’s ability to generate profit from its total assets.	ROA = (Net Income After Tax/Total Assets)
Leverage (DER)	A ratio indicating the extent to which a company finances its operations through debt relative to equity.	DER = (Total Debt/Total Equity)

This study employs three regression models to examine the relationships among the variables. The first model is designed to analyze the direct effect of ESG performance and capital intensity (CI) on tax avoidance (TA). The second model extends this analysis by incorporating control variables, namely firm size (FS), profitability (ROA), and leverage (DER), to provide a more comprehensive assessment. The third model further develops the framework by introducing board gender diversity (BGD) as a moderating variable, while still controlling for FS, ROA, and DER. The regression equations for each model are specified as follows:

This study uses three models. The impact of ESG and CI on TA is examined using the first model. Using FS, ROA, and DER as control variables, the second model examines how ESG and CI affect TA. Using FS, ROA, and DER as control variables and BGD as a moderating variable, the third model examines the impact of ESG and CI on TA. The following are the equations for each model:

$$BTD_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 CI_{it} + \epsilon \dots\dots\dots(1)$$

$$BTD_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 CI_{it} + \beta_3 FS_{it} + \beta_4 ROA_{it} + \beta_5 DER_{it} + \epsilon \dots\dots\dots(2)$$

$$BTD_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 CI_{it} + \beta_3 FS_{it} + \beta_4 ROA_{it} + \beta_5 DER_{it} + \beta_6 BGD + \beta_7 ESG_{it} * BGD_{it} + \beta_8 CI_{it} * BGD_{it} + \epsilon \dots\dots\dots(3)$$

RESULTS

The model estimation process in this study involves three specification tests, namely the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test. The Chow test results indicate a cross-section probability value of 0.0000, which is below the 0.05 significance level, suggesting that the Fixed Effect Model (FEM) is preferred over the Common Effect Model (CEM). However, the Hausman test produces a cross-section probability value of 0.34, exceeding the 0.05 threshold, indicating that the Common Effect Model (CEM) is more appropriate than the Random Effect Model (REM). Due to the inconsistency between the Chow and Hausman test outcomes, the Lagrange Multiplier test is conducted as an additional evaluation. The LM test yields a cross-section probability value of 0.3298, which is greater than 0.05, confirming that the Common Effect Model (CEM) is the most suitable model for this study. The detailed results of these model selection tests are presented in Table 3.

Table 3. The statistical testing result

Variable	Model 1			Model 2			Model 3		
	B	p-value	Sign	B	p-value	Sign	B	p-value	Sign
ESG	-0.0001	-7.4338	0.0000*	-0.0001	-5.6317	0.0000*	-2.9905	-0.6300	0.5288
CI	0.0183	9.9133	0.0000*	0.0084	15.4676	0.0000*	0.0186	5.1176	0.0000*
FS				0.0025	8.6358	0.0000*	0.0024	7.9677	0.0000*
ROA				0.3161	21.1599	0.0000*	0.3326	22.4708	0.0000*
DER				1.6205	0.0472	0.9624	-4.6705	-0.1284	0.8979
BGD							0.0008	6.6538	0.0000*
ESG*BGD							-1.2207	-0.0619	0.9507
CI*BGD							-0.0003	-2.5901	0.0097*
Constant		7.4952			-0.0616			-0.0852	
Adjusted R ²		0.1001			0.5170			0.7015	
F-statistic		52.4029			198.8366			272.3919	
Fp-value		0.0000*			0.0000*			0.0000*	

Dependent Variable: Tax Avoidance
*significant 0.05

Source: Data Processing, 2025

Model 1:

$$BTD = 7.4952 - 0.0001ESG + 0.0183CI$$

The results of the first model indicate that ESG and capital intensity (CI) jointly account for approximately 10% of the variation in tax avoidance (TA), while the remaining 90% is explained by factors not included in the model. ESG shows a negative relationship with TA, whereas CI exhibits a positive association. Furthermore, both ESG and CI are found to have a statistically significant effect on TA, both individually and simultaneously, thereby supporting Hypotheses 1 (H1) and 2 (H2). Overall, ESG and CI explain 10.01% of the variation in TA, with the remaining 89.99% attributed to other variables outside the scope of this study.

Model 2:

$$BTD = -0.0615 - 0.0001ESG + 0.0084CI + 0.0024FS + 0.3160ROA + 1.6200DER$$

The second model indicates that ESG, capital intensity (CI), and the control variables collectively explain 51.70% of the variation in tax avoidance (TA), while the remaining 48.30% is attributable to factors not included in the model. ESG demonstrates a negative association with TA, whereas CI and all control variables show positive relationships. The results further reveal that ESG, CI, and the control variables jointly have a statistically significant effect on TA. When examined individually, firm size (FS) and profitability (ROA) are found to effectively control the relationship between ESG, CI, and TA, whereas leverage (DER) does not exhibit a significant controlling effect. Overall, the inclusion of control variables increases the explanatory power of the model, with ESG and CI accounting for 51.70% of the variation in TA, while the remaining 48.30% is explained by other external factors.

Model 3:

$$BTD = -0.0852 - 2.9900ESG + 0.0186CI + 0.0023FS + 0.3325ROA - 4.6700DER + 0.0007BGD - 1.2200ESG*BGD - 0.0002CI*BGD$$

The results of the third model show that ESG, capital intensity (CI), the moderating variable, and the control variables collectively explain 70.15% of the variation in tax avoidance (TA), while the remaining 29.85% is attributed to factors not included in the model. ESG, leverage (DER), and the interaction terms (ESG×BGD and CI×BGD) exhibit negative relationships with TA, whereas the other variables demonstrate positive associations. In terms of moderation effects, board gender diversity (BGD) does not significantly moderate the relationship between ESG and TA, leading to the rejection of Hypothesis 3a (H3a). However, BGD is found to moderate the relationship between CI and TA, thereby supporting Hypothesis 3b (H3b). Overall, the inclusion of the moderating variable enhances the explanatory power of the model, with ESG and CI accounting for 70.15% of the variation in TA, while the remaining 29.85% is influenced by other factors beyond the scope of this study.

A sensitivity analysis was conducted to assess potential differences in the model's performance during and outside the pandemic period. This analysis incorporates the effects of ESG performance,

capital intensity (CI), firm size (FS), profitability (ROA), and return on equity (ROE). To distinguish between the two periods, a dummy variable was applied, where a value of 1 represents the pandemic period and 0 indicates the non-pandemic period.

Table 4. The Sensitivity Analysis

Variable	Short-run Coefficient	Long-run Coefficient	Sensitivity
C	-0.0025	-0.0767	30.86
ESG	0.0006	-0.0001	-0.25
CI	0.0146	0.0177	1.22
FS	-0.0107	0.0029	-0.27
ROA	0.3367	0.2295	0.68
DER	-0.0101	0.0004	-0.04
D_COV	-0.0004	0.0012	-3.00
BTD(-1)	-0.2618	0.4751	-1.81
Total	0.0667	0.6487	30.39
Total_cov	0.0663	0.6499	27.40

Source: Data Processing, 2025

The results of the sensitivity analysis for the period without the COVID-19 pandemic are presented in Table 4. The findings reveal that, in the short term, the Book-Tax Difference (BTD) of non-financial firms in the ASEAN region increased by 6.67%. An increase in BTD indicates a decline in tax avoidance (TA), suggesting that, in the absence of the pandemic, TA practices influenced by ESG, capital intensity (CI), firm size (FS), profitability (ROA), and leverage (DER) decreased in the short run. In the long term, BTD rose by 64.87% under non-pandemic conditions, reflecting the sustained influence of ESG, CI, FS, ROA, and DER. Similarly, during the COVID-19 pandemic, these variables also exhibited a long-term effect, with BTD increasing by 64.99%. The sensitivity values for TA were recorded at 27.40% during the pandemic period and 30.39% in the non-pandemic period. Since both values are below 50%, the model can be considered relatively insensitive to changes related to the COVID-19 pandemic. This finding also implies that tax avoidance behavior is not highly responsive to variations in the underlying assumptions or input factors examined in this study. The sensitivity analysis findings without the COVID-19 pandemic are shown in Table 4. The findings indicate a short-term 6.67% growth in the BTD of non-financial firms in the ASEAN region. The company's TA decreases as the BTD increases. This indicates that TA practices used by businesses in the ASEAN region and impacted by ESG, CI, FS, ROA, and DER rose by 6.67% in the short term in the absence of a pandemic. Long-term, in the absence of a pandemic, BTD increased by 64.87% due to the effect of ESG, CI, FS, ROA, and DER. All of the factors examined during the COVID-19 pandemic had a long-term impact on BTD, which increased by 64.99%. Sensitivity values for TA practice were 27.40% during the COVID-19 pandemic and 30.39% in the absence of the pandemic. The fact that both numbers are less than 50% suggests that the study model is insensitive to the occurrence of the COVID-19 pandemic. Additionally, this suggests that TA procedures are insensitive to shifts in inputs or presumptions about the impacting factors.

The proposed model is used to evaluate the sensitivity of firms' tax compliance behavior within ASEAN countries. The findings of the analysis are presented in the following table.

Table 5. The ASEAN region's tax compliance sensitivity analysis

Country	Mean BTD	Mean Coefficient	Constant	Std. Deviation	Difference	Meaning of BTD
					Mean Coefficient and Mean BTD	
Indonesia	-0.0176	-0.0176	-0.0767	0.0307	0.0000	Tend to be Less Tax Compliant
Thailand	-0.0015	-0.0014	-0.0767	0.1019	0.0001	Tend to be Less Tax Compliant
Singapore	0.0087	0.0087	-0.0767	0.0269	0.0000	Tend to be Less Tax Compliant
Malaysia	-0.0015	-0.0016	-0.0767	0.0415	-0.0001	Tend to be Tax Compliant
Philippines	0.0217	0.0214	-0.0767	0.0609	-0.0002	Tend to be Tax Compliant

Source: Data Processing, 2025

Based on the applied research methodology, Table 5 presents the long-term patterns of tax compliance among firms in the ASEAN region. The results indicate that companies operating in Singapore, Thailand, and Indonesia exhibit a relatively low level of tax compliance, suggesting a mild tendency toward tax avoidance (TA). In contrast, firms in the Philippines and Malaysia demonstrate a stronger inclination toward tax compliance. Indonesia, Thailand, and Singapore are among the ASEAN countries experiencing significant economic growth. As economic conditions improve, the level of business activity, particularly within the non-financial sector also increases. The sensitivity analysis of tax compliance suggests that this heightened economic activity intensifies competition among firms in these countries. Such competitive pressure may encourage companies to adopt tax minimization strategies, potentially leading to reduced tax payments. In this context, firms strive to maintain their profitability and market position, often seeking to avoid substantial declines in earnings that could result from higher tax obligations.

The findings for Malaysia and the Philippines present a contrasting pattern. Firms in both countries are characterized by a stronger long-term tendency toward tax compliance, with relatively lower levels of tax avoidance (TA). This condition is reflected in the positive difference between the mean Book-Tax Difference (BTD) and the mean coefficient, which remains below the standard deviation. Such outcomes may be attributed to effective tax governance in both countries, supported by efforts to enhance public awareness and compliance with tax obligations. These measures contribute to sustaining long-term economic development in Malaysia and the Philippines. Furthermore, the sensitivity analysis suggests that the model applied in this study is particularly suitable for capturing tax behavior in these two countries. This is indicated by the positive constant in the panel regression model, implying that tax avoidance decreases when the independent and control variables are held constant. Overall, the regression results are consistent with the sensitivity analysis, confirming that firms in Malaysia and the Philippines tend to exhibit higher tax compliance and lower engagement in tax avoidance over the long term.

DISCUSSION

The empirical results indicate that ESG performance has a significant negative effect on tax avoidance (TA) in both Model 1 and Model 2, thereby supporting Hypothesis 1 (H1). In this study, TA is proxied by the Book-Tax Difference (BTD), where a larger gap between accounting income and taxable income reflects a higher level of tax avoidance. Accordingly, an increase in BTD corresponds to a greater intensity of TA practices. The findings suggest that firms with stronger ESG performance tend to engage less in tax avoidance activities. Companies that demonstrate high ESG performance are more likely to adopt well-structured and responsible business strategies, which encourage compliance with tax obligations while maintaining long-term sustainability. From the perspective of stakeholder theory, ESG performance plays a crucial role in shaping corporate behavior, as firms are expected to fulfill their responsibilities toward various stakeholders (Freeman, 1984). When these responsibilities are effectively carried out, stakeholder satisfaction is enhanced (Mu, et., al., 2024). This perspective aligns with legitimacy theory, which emphasizes that firms must meet societal expectations to gain acceptance and maintain legitimacy. ESG performance, therefore, serves as a reflection of a firm's commitment to social responsibility. Furthermore, the implementation of ESG practices can influence corporate strategies aimed at meeting stakeholder expectations, while also strengthening trust among investors and customers through improved corporate reputation. Overall, the results of this study are consistent with the principles of stakeholder theory, legitimacy theory, and agency theory, all of which high

The findings of this study are consistent with prior research conducted by (Ariza, 2025; Diana, 2023; Indudewi, 2024; Jiang, et., al., 2024; Khlifi, et., al., 2025; Nurlaely & Dewi, 2024; Yoon, et., al., 2021). These studies suggest that firms may leverage strong ESG performance not only to enhance their corporate image but also as a strategic tool to engage in tax avoidance (TA). In this context, higher ESG performance may be associated with an increased likelihood of tax minimization practices, indicating that ESG initiatives could, in some cases, reflect short-term strategic behavior rather than a genuine

commitment to long-term sustainability. However, these results differ from other studies, such as those by (Baroroh, 2025; Duong & Huang, 2022; Lee, 2024; Teja, 2024; Zhang, et., al., 2021), which report an opposing relationship. According to this stream of research, firms with strong ESG performance tend to emphasize responsible management of ESG-related activities, thereby reducing the likelihood of engaging in tax avoidance. In addition, companies with higher ESG standards are more likely to adopt prudent and transparent business practices to maintain investor confidence and public trust.

The differences in findings may be partly explained by variations in the ESG data sources used. This study relies on ESG scores obtained from LSEG Data & Analytics, whereas other studies have utilized ESG ratings from Bloomberg. Differences in data providers may lead to inconsistencies in ESG measurement due to variations in evaluation criteria and scoring methodologies. In addition, discrepancies in empirical results may also arise from differences in tax systems across the countries examined. Previous studies have often focused on Indonesia, which applies a relatively complex progressive tax structure. In contrast, corporate tax rates across ASEAN countries vary, including Indonesia (22%), Malaysia (33%), Singapore (17%), the Philippines (25%), and Thailand (20%). Although Thailand's tax system is generally less complex than Indonesia's, it may still contain regulatory gaps that can be exploited for tax avoidance. Malaysia is known for its relatively competitive tax regime, while Singapore is widely recognized for having one of the most efficient and straightforward tax systems globally. Meanwhile, the Philippines applies a tax system that includes various exemptions, contributing to its complexity. These differences in tax frameworks across countries may contribute to the variation in research outcomes compared to prior studies, as firms operate under distinct regulatory environments that influence their tax behavior.

The inclusion of control variables in Model 2 indicates that firm size (FS) and profitability (ROA) effectively account for the relationship between ESG, capital intensity (CI), and tax avoidance (TA), thereby reducing potential estimation bias. In contrast, leverage (DER) does not exhibit a significant controlling effect. In Model 3, ESG performance is found to have no significant influence on TA, leading to the rejection of Hypothesis 1 (H1). This result suggests that ESG performance does not play a decisive role in shaping corporate tax avoidance behavior. Consequently, board gender diversity (BGD) is not found to moderate the relationship between ESG and TA, resulting in the rejection of Hypothesis 3a (H3a). These findings imply that ESG performance is perceived as part of a firm's long-term sustainability strategy rather than a mechanism for tax avoidance. Within this context, BGD does not strengthen or weaken the ESG TA relationship, as ESG initiatives are oriented toward responsible governance and sustainable value creation rather than short-term tax minimization.

The results of the second hypothesis test indicate that capital intensity (CI) has a positive and statistically significant effect on tax avoidance (TA) across all estimated models, thereby supporting Hypothesis 2 (H2). This finding suggests that firms with higher levels of capital intensity tend to exhibit greater tax compliance. A high CI reflects substantial investment in fixed assets, which is primarily driven by business expansion strategies and operational requirements rather than an intentional effort to engage in tax avoidance. This result is consistent with agency theory, which emphasizes the need to align the interests of firms and the government, particularly in ensuring that tax obligations are fulfilled to support public revenue and economic development. Based on the sample data, non-financial firms in ASEAN countries demonstrate relatively high capital intensity ratios, indicating significant investments in tangible assets such as factories, machinery, and equipment. These investments allow firms to utilize depreciation expenses associated with fixed assets as part of their tax calculations. Consequently, ASEAN-5 non-financial firms may benefit from allowable depreciation deductions, which can influence their overall tax obligations within the regulatory framework.

The findings of this study are consistent with prior research conducted by (Apriani & Sunarto, 2022; Darsani & Sukartha, 2021; Muhmad, et., al., 2020; Putri, et., al., 2022; Rahma, et., al., 2022; Wang, et., al., 2024; Yunira, et., al., 2025). These studies suggest that firms allocate substantial resources to fixed asset investments as part of their expansion strategies and operational development, with the expectation of generating higher future returns. However, contrasting evidence is reported by Yahya, et., al. (2023) and Suciarti, et., al., (2020), who find different relationships between capital intensity (CI) and tax avoidance (TA). Other studies indicate that firms with higher capital intensity

may be less inclined to engage in tax avoidance practices (Aladwey, 2022). The inconsistencies across findings may be explained by several factors, including differences in sample characteristics and observation periods. While earlier studies often examined broader categories of firms, this study focuses specifically on non-financial companies. Additionally, variations in corporate environments characterized by increasing complexity and dynamic market conditions may also contribute to differing results. Firms operating in highly competitive global markets face pressure to maintain profitability, and tax planning strategies are sometimes viewed as a means to reduce costs and enhance financial performance. One commonly observed approach is the use of transfer pricing practices to shift profits to jurisdictions with lower tax rates.

The results of Model 3 indicate that board gender diversity (BGD) strengthens and moderates the relationship between capital intensity (CI) and tax avoidance (TA), thereby supporting Hypothesis 3b (H3b). A higher proportion of female board members enhances the monitoring of corporate investment decisions, leading to more careful and thorough evaluation processes. As a result, investments in fixed assets are undertaken with greater prudence, ensuring that related tax treatments such as depreciation methods are applied in accordance with prevailing tax regulations. This improved oversight reduces the likelihood of firms engaging in tax avoidance practices associated with fixed asset management.

CONCLUSION

In Models 1 and 2, where tax avoidance (TA) is proxied by the Book-Tax Difference (BTD), firms with higher ESG performance appear more inclined to engage in tax planning practices. Although ESG disclosure reflects a firm's long-term commitment to sustainability and encourages compliance with regulatory frameworks, it may also coexist with strategies aimed at optimizing tax outcomes. The primary objective of ESG is to ensure that companies operate in a responsible, transparent, and sustainable manner. The findings suggest that firms with strong ESG performance tend to adopt well-structured business strategies, using ESG not only to enhance social responsibility but also as a mechanism for organizational development and reputation building. However, the presence of female board members focused primarily on ESG-related initiatives does not significantly weaken the relationship between ESG and tax avoidance. Instead, their role may reinforce corporate reputation without directly influencing tax-related decisions. Conversely, an increase in capital intensity (CI) tends to encourage firms to adopt tax minimization strategies. This occurs because companies can utilize depreciation expenses from fixed assets to reduce taxable income, with the magnitude of tax reduction depending on the depreciation methods applied. Moreover, when female board members possess financial expertise, they are more likely to support strategies that optimize financial reporting, including approaches that reduce reported profits and, consequently, lower tax obligations.

The findings of this study indicate that tax avoidance (TA) behavior among non-financial firms in ASEAN differed significantly between the pre-pandemic and pandemic periods. Compared to the period before the COVID-19 outbreak, the level of TA in ASEAN countries increased during the pandemic, both in the short term and in the long term. The sensitivity analysis indicates that firms in Singapore, Thailand, and Indonesia demonstrate a relatively higher propensity for tax avoidance. In contrast, companies operating in Malaysia and the Philippines show a lower tendency to engage in such practices. Therefore, the research model employed in this study appears to be more suitable for capturing the tax behavior of firms in Malaysia and the Philippines compared to other ASEAN countries.

The findings of this study provide important insights for the formulation of policies related to tax avoidance (TA). Corporate decisions concerning board gender diversity, fixed asset investments, and sustainability practices are shown to influence firms' tax behavior. As the authority responsible for tax regulation, the government is expected to design policies that limit opportunities for tax avoidance. In addition, establishing clear standards for ESG disclosure is essential to facilitate more effective monitoring and evaluation. The government should also consider principles of gender equality when determining policies related to board composition, ensuring adequate representation of women in corporate leadership.

This study has several limitations that should be acknowledged. First, the observation period is restricted to 2019–2023, which may limit the generalizability of the findings over a longer timeframe. Second, the sample size is relatively limited due to the large number of ASEAN firms that do not disclose ESG data. In addition, the focus on non-financial companies makes it difficult to generalize the results across different industry sectors. Therefore, future research is encouraged to expand the scope of analysis by including a broader range of firms across ASEAN countries. Further studies may also consider incorporating additional variables beyond financial factors that could influence tax avoidance (TA) behavior. These may include technological aspects, such as digital business models, digital tax administration, and innovation in digital systems, as well as individual characteristics of taxpayers, including cultural values, religious perspectives, and behavioral attitudes.

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