HOW BOARD DIVERSITY SHAPE TAX AVOIDANCE: EVIDENCE ON THE MEDIATING ROLE OF EARNINGS MANAGEMENT

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Abstract

Background: Corporate tax avoidance remains a significant challenge in Indonesia's fiscal system, reflecting managerial discretion and weak corporate governance. While prior studies mainly emphasize firm-level factors, limited research explores how board characteristics shape corporate tax decisions, particularly through earnings management mechanisms.

Objective: This research intends to examine the impact of board diversity, comprising gender diversity, board size, and educational background, on corporate tax avoidance, in addition to investigate the mediating role of earnings management in this relationship

Research Methods: The study uses 417 firm-year observations from 139 publicly listed manufacturing companies on the IDX from 2019-2021. The study utilizes panel data regression to evaluate direct and mediating effects, with firm size and year as control variables. Earnings management is quantified using the Modified Jones Model, while tax avoidance is represented by the Cash Effective Tax Rate (CETR)

Research Results: The findings shows that a higher percentage of female directors is associated with lower earnings manipulation and tax avoidance, consistent with more conservative reporting and compliance-oriented decisions..Conversely, educational background exhibits a positive relationship with tax avoidance, implying that financially literate boards may exploit tax planning opportunities. Board size shows no significant effect on either variable. Mediation analysis confirms that earnings management mediates the nexus between gender diversity and tax avoidance, but not for board size or educational background. Furthermore, firm size and the research year, affect earnings management but not tax avoidance.

Originality/Novelty of Research: This study enriches upper echelon theory by providing mechanism based evidence that earnings management serves as the channel through which board attributes translate into corporate tax avoidance in an emerging market setting.

Keywords: Board Diversity, Earnings Management, Tax Avoidance, Upper Echelon Theory, Corporate Governance

Introduction

One of the persistent issues in Indonesia is corporate tax avoidance, as evidenced by tax examination fines amounting to approximately Rp 1.92 trillion in 2022. Because corporate taxes are a major source of public revenue, tax avoidance weakens the government's fiscal capacity and raises concerns about compliance and fairness (Bogachov et al., 2024). Furthermore, taxation plays a crucial role in promoting balanced urban-rural development and mitigating disparities in economically disadvantaged rural regions

(Ávila-lópez et al., 2024). However, the effectiveness of taxation in supporting economic stability is often undermined by widespread corporate tax avoidance.

Tax avoidance serves as a managerial strategy aimed at retaining greater financial resources within the firm and maximizing shareholders' wealth (Wang et al., 2023). From a company perspective, taxation constitutes an extra cost element that decreases the firm's cash flow and, consequently, the returns to shareholders (Aburajab et al., 2019). Accordingly, the magnitude of firms' tax avoidance practices may depend on corporate governance characteristics, particularly the diversity of the board of directors.

Board of Directors (BOD) bears the primary responsibility for ensuring that corporate strategies align with ethical standards and long-term stakeholder interest (Wijayanti & Setiawan, 2023). In the contemporary business environment, organizations benefit from a more diverse boardroom, as diversity enhances the range of perspectives and insights, improves problem-solving and networking capabilities, and strengthens the firm's overall corporate images (Khatib et al., 2023). Board of Directors (BOD) diversity, encompassing aspects such as board size (Nguyen & Huynh, 2023; Nicolò et al., 2023; Sierra-Morán et al., 2024), gender diversity measured as the percentage of female directors, and directors' educational background (Campos-García & Zúñiga-Vicente, 2023; Kim & Kim, 2023; López-Cabarcos et al., 2023), and educational background (Al-Shammari, 2022; Al-Zaqeba et al., 2023; Lee et al., 2024) has been empirically associated with improved firm performance and a reduced likelihood of fraudulent behavior (Khatib et al., 2023).

Prior research on corporate tax avoidance is substantial, but much of it focuses on firm-level determinants or treats board characteristics as direct predictors, that do not explain the decision process through which board composition translates into tax outcomes (In Tishar & Hasanuzzaman, 2019; Rahman & Karim, 2016; Islam & Hashim, 2023; Mgammal et al., 2018; Wahab et al., 2017). This study contributes by shifting the emphasis from whether board composition matters to how it matters. Specifically, we test whether board gender diversity, educational background, and board size influence corporate tax avoidance through earnings management, positioning financial reporting discretion as the mechanism linking board attributes to tax behavior. The novelty therefore lies in providing mechanism-based evidence rather than proposing a new predictor. By doing so, the paper clarifies whether board characteristics affect tax avoidance primarily by shaping reporting discretion, rather than only through direct board attributes, rather than solely through direct governance effects.

Literature Review

Upper Echelon Theory

The application of upper echelon theory in assessing the correlation between board diversity and corporate tax avoidance remains limited (Khatib et al., 2019). According to upper echelon theory, variations in firm performance and organizational outcomes arise from the experiences, values, and personality traits of top executives who make strategic decisions (Ludigdo et al., 2025). According to Hambrick & Mason, (1984) executives are typically chosen because their backgrounds are perceived to equip them with the capabilities necessary to pursue actions that align with shareholders' strategic objectives. Organizational diversity tends to "spill over" from top management teams to other hierarchical levels, influencing the behavior and decision-making of functional and operational units (Tonoyan & Olson-Buchanan, 2023).

In this study, earnings management is positioned as a behavioral and accounting channel through which the board's attributes are translated into tax outcomes. Earnings management can be viewed as a board-level decision outcome, shaped by directors' characteristics in exercising discretion over financial reporting (Taleatu et al., 2020). These choices determine the extent of earnings management, which functions as an intermediate outcome of upper-echelon decision-making (Plöckinger et al., 2016). Once earnings management occurs, it can subsequently affect tax avoidance because discretionary reporting provides flexibility to shift or smooth accounting earnings, influence taxable bases, and obscure aggressive tax positions (Sharaf et al., 2026). Thus, board diversity is expected to influence tax avoidance indirectly by first affecting the board's propensity to allow or constrain earnings management, which then alters the opportunity set for tax-minimizing strategies (Yahaya et al., 2025).

Board Diversity

Board diversity denotes the varying attributes that characterize the composition of the board of directors (Mihai et al., 2021). It encompasses differences in demographic attributes, such as gender and educational background, as well as structural characteristics, including board size, which collectively shape the board's decision-making and governance effectiveness (Beji et al., 2021). Moreover, a diverse board facilitates stronger relationships with external stakeholders and signals the company's commitment to inclusivity and diversity values (Fernández-Temprano & Tejerina-Gaite, 2020).

Gender diversity, commonly measured by the percentage of female representation on the board of directors, has received increasing attention not only from scholars but also from regulatory and policy perspective (Behlau et al., 2024). Alongside gender, other dimensions such as board size and educational background have also been recognized as important components of board diversity, as they influence the board’s collective expertise, decision-making capacity, and strategic oversight (Asad et al., 2023). Board size denotes the total number of directors on a company’s board, representing a structural aspect of corporate governance that affects the board’s monitoring and strategic capabilities (Karagiannopoulou et al., 2025). Meanwhile, the educational background of board members enables a deeper understanding of complex business situations and supports more informed and effective strategic judgments (Sidki et al., 2024).

Earnings Management

Earnings management is undertaken to obtain certain economic or strategic advantages by altering the timing or recognition of revenues and expenses in financial statements (Ali et al., 2024). Such practices modify a company’s disclosed financial performance aimed at misleading stakeholders or affecting contractual agreements in favor of managerial objectives (Bui, 2024). In the Indonesian corporate context, earnings management is typically carried out by top management, specifically the board of directors (Aryani et al., 2024). Under Indonesia’s two-tier board structure, the board of directors plays an executive role in formulating and implementing corporate strategies, whereas the board of commissioners serves an oversight function, ensuring that managerial actions comply with governance principles and that adequate internal control systems are in place (Mardianto et al., 2024).

Earnings management functions as a managerial instrument to accomplish multiple objectives, including preserving family ownership influence, securing managerial incentives, and fulfilling market performance expectation (Itan et al., 2024). Earnings management by the board of directors may stem from internal motives, such as inflating reported earnings to increase stock prices or strengthen perceived firm performance, such as inflating reported earnings to increase stock prices or strengthen perceived firm performance, as well as external pressures related to market expectations, stakeholder confidence, taxation, and performance benchmarks (Mamatzakis & Bagntasarian, 2021). Board of directors often prefer accrual-based earnings management when regulatory of supervisory pressure is limited, as it can be executed without altering real operations (Attia et al., 2024).

Tax Avoidance

In the context of corporate taxation, tax avoidance is conceptualized as the managerial practice of leveraging regulatory loopholes to legally minimize tax payments and optimize after-tax earnings (Hossain et al., 2024). Although tax avoidance is legally permissible, it is often perceived as an unethical corporate practice that undermines the firm’s social responsibility and the government’s capacity to enhance public welfare (Elamer et al., 2024). Such practices weaken the functioning of the state, constrain the provision of public services, and hinder socio-economic development, ultimately exerting adverse effects on private sector activities (Amelio et al., 2025).

Investors often weigh the potential financial benefits of tax avoidance against its associated risks, recognizing that although such practices can enhance after-tax returns, they are generally viewed unfavorably by tax authorities and may expose firms to reputational and regulatory consequences (Qawqzeh, 2023). The perception of tax avoidance as both a profit-enhancing and ethically questionable strategy creates tension in managerial decision-making. The orientation of the board of directors can shape whether tax avoidance is pursued as a managerial strategy for profit maximization or constrained in favor of upholding corporate governance quality and ethical responsibility (Tran et al., 2023). Hence, understanding how board composition influences managerial judgment is essential to explain variations in corporate tax avoidance behavior across firms.

Hypothesis Development

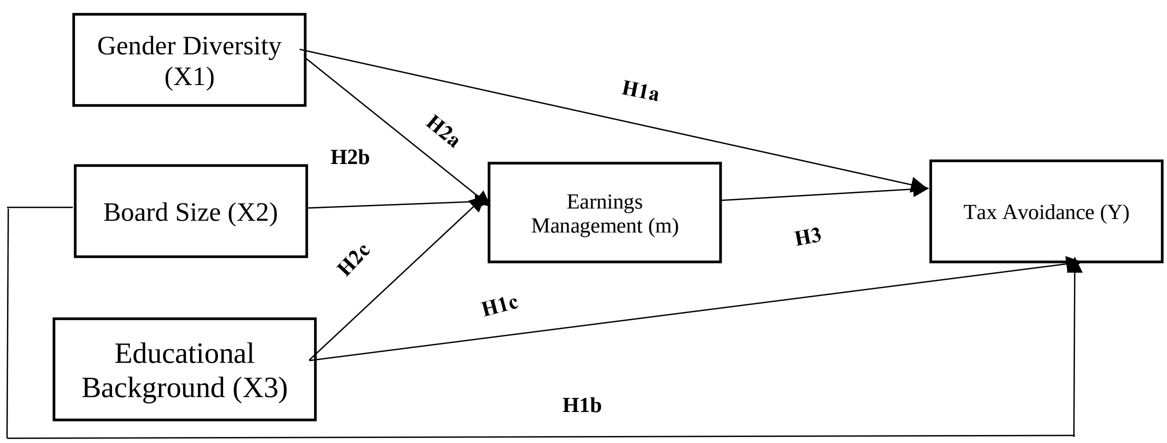

Figure 1 Conceptual Framework

Greater board gender diversity, measured as the percentage of female directors, is expected to be associated with lower aggressive tax avoidance, enhances ethical judgment in tax-related decisions and reduces the propensity for engaging in aggressive tax avoidance strategies (Elgharabawy & Aladwey, 2025). As upper echelon theory posits that top-level executives shape organizational outcomes through their personal values, experiences, and cognitive frameworks, gender diversity within the board of directors can introduce a broader range of perspectives that influence how companies interpret and comply with regulations (Basson & van der Spuy, 2025). This cognitive heterogeneity enriches deliberative processes within the board, as women directors tend to emphasize ethical responsibility, fairness, and long-term sustainability, thereby strengthening the firm's transparency and accountability mechanisms (Lerum, 2024). Empirical evidence suggests that women generally display higher levels of risk aversion, ethical awareness, and conservative judgment than men, traits that may shape corporate decisions concerning tax planning and avoidance practices (Giannarou & Tzeremes, 2025). Based on the above theoretical arguments and empirical findings, it can be inferred that boards with greater gender diversity tend to engage less in aggressive tax practices due to their stronger ethical orientation and risk-averse behavior. Therefore, the following hypothesis is proposed:

H1a: A higher percentage of female directors on the board of directors is linked to lower levels of aggressive tax avoidance

Board composition, measured by its total number of directors, is a crucial dimension of governance structure that needs to be optimized to guarantee the adequacy of oversight, accountability, and the effective performance of the board's various functions (Hoseini et al., 2019). An increase in board size may enhance the board's collective expertise and knowledge base by incorporating directors with varied professional experiences and educational backgrounds, thereby enriching the decision-making process (Issa & Bensalem, 2023). Accordingly, a larger board size tends to foster greater diversity in skills, professional experience, and educational background, which can contribute to improved oversight and a stronger commitment to tax compliance (Inneh et al., 2024). Consistent with upper echelon theory, the characteristics and composition of the board reflect the firm's collective cognitive framework that drives strategic outcomes. Accordingly, larger boards, by integrating broader expertise and perspective, are expected to enhance decision quality and reduce the tendency toward aggressive tax behavior (Puntaier et al., 2022). The broader range of insights within larger boards facilitates more rigorous discussions and ethical deliberations, enabling the board to identify and mitigate potential risks related to non-compliance and aggressive tax practices.

H1b: Board size positively influence tax compliance

The educational background of board members shapes their knowledge, cognitive orientation, and decision-making perspectives, which can reduce corporate engagement in tax avoidance and alleviate stakeholder concerns regarding business risk (Chen & Hao, 2022). The presence of directors with varied educational backgrounds provides a broader range of cognitive skills and analytical reasoning, enabling the board to evaluate complex issues more effectively and reduce the likelihood of risk-taking behaviors like aggressive tax avoidance (Khan et al., 2024). In line with upper echelon theory, a higher educational background enhances directors' cognitive frameworks and strategic reasoning, fostering prudent decision-making and reducing engagement in high-risk behaviors such as tax avoidance (Ali et al., 2022). Given that tax avoidance can lead to reputational losses, political costs, and heightened regulatory scrutiny, directors possessing educational backgrounds in economics and business are more inclined to adopt a risk-averse stance, thereby discouraging aggressive tax practices (Pan et al., 2024).

Board members with educational backgrounds in accounting, finance, or economics are more likely to carefully consider the tension between the potential gains and losses from tax avoidance, leading them to favor greater tax compliance and transparency (Lanis et al., 2021). Building on this perspective, such directors possess a deeper understanding of the long-term consequences of non-compliance, including reputational damage, regulatory sanctions, and political costs (Dyreng et al., 2023). Their tax knowledge equips them to design tax strategies that balance efficiency with ethical and legal considerations (Appiah et al., 2024). Consistent with upper echelon theory, the educational background of directors shapes their cognitive orientation and ethical judgment, guiding them toward decisions that minimize aggressive tax behavior. Therefore, the following hypothesis is proposed:

H1c: The extent of board members with educational background in accounting, finance, or economics is negatively associated with corporate tax avoidance

Female directors are often perceived to demonstrate greater ethical sensitivity and risk aversion, accompanied by a lower tolerance for opportunistic managerial behavior than their male counterparts (Zalata et al., 2022). Female directors help constrain earnings management by enhancing the quality of board deliberations, curbing opportunistic managerial behavior, and strengthening the board’s professionalism in evaluating financial reports and detecting irregularities in financial statements (Mensah & Onumah, 2023). Furthermore, female directors are more concerned with preserving their reputational capital and maintaining ethical integrity, therefore, they exhibit reduced engagement in earnings management practices (Mnif & Cherif, 2020). Such behavior indicates that gender diversity can influence the ethical tone and decision-making quality within the boardroom (Alves et al., 2024). Based on upper echelon theory, gender-based cognitive distinctions among directors are recognized, and female directors exhibiting greater effectiveness in mitigating managerial opportunism (Elzahar et al., 2022). Therefore, firms with higher percentage of female representation on their boards are expected to exhibit greater financial reporting integrity and lower level of earnings management (Yami et al., 2023).

H2a: Board gender diversity, measured as the percentage of female directors is negatively associated with earnings management

Board characteristics, such as board size, which denotes the total number of directors, are posited by upper echelon theory to be critical determinants influencing strategic decisions and shaping a firm's financial reporting behavior (Terbeck et al., 2022). From this perspective, a larger board implies the presence of directors with diverse backgrounds, experiences, and areas of expertise, which can enrich deliberations and enhance the quality of decision-making (Korphaibool et al., 2024). The presence of more directors increases the likelihood of detecting and constraining managerial opportunism, including earnings management practices. Moreover, a larger board facilitates broader engagement with external stakeholders, allowing the company to better understand their expectations, promote greater transparency, and enhance the quality of disclosed information, thereby reducing the incentive for earnings manipulation (Al Azeez et al., 2019).

H2b: Board size is negatively associated with earnings management

Boards composed of members with financial and accounting backgrounds possess greater familiarity with financial reporting frameworks and a deeper understanding of the preparation and interpretation of financial statements, thereby reducing earnings manipulation (Githaiga et al., 2022). Consistent with upper echelon theory, directors' knowledge and intellectual competence from the cognitive foundation for interpreting complex financial information and making ethical judgments, which in turn reduces the likelihood of engaging in earnings management (Fitriasari & Soewarno, 2024). From the investor perspective, firms with highly educated boards, particularly in finance, accounting, and economics, are perceived as more competent and trustworthy, which increases investor confidence and incentivizes the firm to maintain transparent and accurate financial reporting, further limiting earnings management practices (Gounopoulos et al., 2021).

Empirical studies indicate that firms with boards composed of directors who have finance, accounting, or economics education exhibit lower levels of earnings management (Githaiga et al., 2022; Mnif & Cherif, 2020; Zalata et al., 2022). The cognitive skills and ethical awareness associated with higher education enable directors to critically evaluate accounting choices, challenge aggressive reporting, and promote transparency in financial disclosures, while their professional background and expertise facilitate effective communication with stakeholders, further constraining earnings management practices (Issa & Bensalem, 2023). These factors collectively suggest that higher educational and professional qualifications of board members can constrain managerial opportunism in financial reporting

H2c: The educational background of the board of directors is negatively associated with earnings management

Earnings management allows management discretion in financial reporting to present stable performance, which may also affect taxable income and cash taxes (Mai et al., 2025). Management may engage in earnings management alongside tax planning to reduce the firm's tax burden, which can increase after-tax cash flows and potentially enhance shareholder value (Lestari et al., 2025). Because the lowest persistence is observed when firms combine aggressive tax planning with earnings management, this suggests the two behaviors are used jointly, implying a positive relationship between earnings management and tax avoidance (Chen et al., 2025). Evidence from Indonesian firms indicates that discretionary accruals are used alongside tax planning and are associated with lower cash taxes relative to pre-tax income (CETR), implying a positive link between earnings management and tax avoidance (Itan et al., 2024).

H3: Earnings management is positively associated with tax avoidance.

Previous research provides mixed findings on whether board gender diversity, measured as the percentage of female directors directly reduces tax avoidance, suggesting that intermediate mechanism may explain this relationship (Garcia-Blandon et al., 2022; Riguen et al., 2020; Sri Utaminingsih et al., 2022). One potential mechanism is earnings management, a managerial practice that alters reported financial performance and often accompanies tax-related opportunism (Bilal et al., 2023). From the perspective of upper echelon theory, the ethical and cognitive attributes of female directors not only constrain opportunistic reporting behavior but also shape broader corporate conduct, including compliance with tax regulations (Hoseini et al., 2019). Gender-diverse boards are more likely to foster transparent reporting cultures, reduce accounting manipulation, and promote ethical financial practices (Khatib et al., 2023; Yami et al., 2023).

When reported earnings more accurately reflect the firm's true economic performance, managers have fewer opportunities to shift income, defer expenses, or exploit discretionary accruals to minimize taxable income (Sánchez-Ballesta & Yagüe, 2021). Transparent financial reporting constrains the latitude for creative accounting that often serves as a tool for masking tax avoidance activities (Nguyen, 2021). Moreover, reduced earnings management enhances the credibility of financial statements, enabling regulators, investors, and other stakeholders to better assess the firm's tax position and compliance behavior (Lanis & Richardson, 2018). Therefore, it is expected that gender diversity reduces tax avoidance indirectly through its negative effect on earnings management.

H4a: The link between gender diversity on the board and tax avoidance is mediated by earnings management

Although a larger board can directly strengthen oversight and reduce aggressive tax avoidance, its influence may also operate indirectly through earnings management (Yahaya et al., 2025). According to upper echelon theory, a larger board of directors brings together a broader range of managerial expertise and perspectives, which enhances the quality of strategic decision-making and reduces the tendency toward opportunistic reporting behavior (Hoseini et al., 2019). Reduced earnings management enhances transparency and decreases the opportunity to disguise tax avoidance through accounting manipulation (Kalbuana et al., 2023). At the same time, the presence of multiple directors heightens reputational and accountability pressures, discouraging behaviors that could attract regulatory scrutiny or damage legitimacy (Abd Alhadi et al., 2021). In this sense, the association between the size of the board and tax avoidance is not only direct but also channeled through improved financial reporting quality. Firms with larger boards are thus expected to limit earnings management, which subsequently mitigate aggressive tax planning practices.

H4b: Earnings management mediates the connections between board composition in terms of size and tax avoidance

The educational background of board members can influence tax avoidance both directly and indirectly via earnings management. Directors with financial, accounting, or economic education possess the analytical competence to assess complex accounting treatments and recognize the implications of earnings manipulation for tax reporting (Khan et al., 2022). Drawing on upper echelon theory, such directors rely on their cognitive frameworks and professional judgment to promote ethical financial reporting and discourage opportunistic accounting practices (Fitriasari & Soewarno, 2024). Boards composed of financially literate members can detect inconsistencies in reported earnings and ensure compliance with both tax standards (Zalata et al., 2022). By reducing earnings management, they limit opportunities for concealing tax avoidance through discretionary accruals or timing adjustment (Al Lawati & Hussainey, 2021). Moreover, well-educated boards are more attuned to reputational risks and long-term value creation, prompting them to align financial reporting with transparent and lawful tax behavior (Rakia et al., 2024). Therefore, the influence of board members' educational background on tax avoidance operates in part through their capacity to reduce earnings manipulation.

H4c: Earnings management mediates the association between board members' educational background and corporate tax avoidance

Research Methods

This study investigates the mediating role of earnings management in the association between board diversity and tax avoidance in manufacturing companies listed on the IDX. The manufacturing sector is selected as the research context because it plays a vital role in driving Indonesia's economic growth and serves as a significant contributor to national tax revenues (Manihuruk et al., 2021). We employed a sample of 139 Indonesian manufacturing firms over the 2019-2021 period, yielding 417 firm-year observations. The period was characterized by the economic downturn associated with the COVID-19 pandemic, which provides a unique setting to analyze how board attributes affect corporate financial decisions and tax-related decisions under conditions of financial uncertainty.

The sample was obtained using a purposive sampling technique to ensure that the selected firms met specific criteria relevant to the research objectives and could appropriately represent the target population (Campbell et al., 2020). This approach allows for the inclusion of firms with complete financial and governance data during the observation period, thereby enhancing the reliability of the analysis. Specifically, the inclusion criteria required firms to have complete financial statements and governance disclosures for the 2019-2021 period, as well as data availability on board composition variables, such as gender diversity, board size, and educational background. Firms presenting financial statements in U.S. dollars or lacking access to annual reports were excluded to maintain data consistency and comparability across firms. By focusing on firms that satisfy these requirements, the purposive sampling approach enhances the internal validity and robustness of the empirical results, ensuring that the sample accurately reflects the population of Indonesian manufacturing firms listed on the IDX during the study period.

Table 1. Process of Research Sample Selection

	2019	2020	2021
Number of manufacturing firms listed on the IDX	184	196	214
Firms whose annual financial reports were inaccessible	(35)	(45)	(67)
Firms lacking complete data on board characteristics	(0)	(0)	(0)
Firms presenting financial statements in U.S. Dollars	(10)	(12)	(8)
Total Research Sample	139	139	139

Measurement of Variables

Table 2. Variable Measures

Dependent Variable	
Tax Avoidance	$\text{Cash ETR} = \frac{\text{Cash Taxes Paid}}{\text{Pre}-\text{Tax Income}}$ (Riguen et al., 2020)
Independent Variable	
Board Gender Diversity	$\text{Gender Diversity} = \frac{\text{Number of Female Directors}}{\text{Total Number of Directors}} \text{ x } 100\%$ (Riguen et al., 2020)
Board Size	Board Size = ln (Number of Directors) (Hoseini et al., 2019)
Board Educational Background	$\text{Educational Background} = \frac{\text{Economic Background Directors}}{\text{Total Directors}}\ x\ 100\%$ (Githaiga et al., 2022)
Mediating Variable	
Earnings Management	$DA_{it} = \frac{TA_{it}}{A_{it-1}} - \left(\beta_1 \left(\frac{1}{A_{it-1}}\right)\right) + \beta_2 \left(\frac{0REV_{it}}{A_{it-1}} - \frac{0REC_{it}}{A_{it-1}}\right) + \beta_3 \left(\frac{PPE_{it}}{A_{it-1}}\right)$ (Attia et al., 2024)
Control Variable	
Firm Size	Firm Size = ln (Total Assets) (Qawqzeh, 2023)
Year effect	$YEAR_t = \begin{cases} 1, & \text{if observation is in year } t \\ 0, & \text{otherwise} \end{cases}$ (Atif et al., 2019)

Panel data regression methodology is implemented to examine the influence of earnings management on tax avoidance practices (MacCarthy, 2021), as panel data estimation provides more accurate results by combining the strengths of using both time-series and cross-sectional data (Amidu et al., 2019). Data processing and analysis were conducted using Eviews 10 software, with an outlier test performed to prevent errors caused by extreme data (Field, 2013), followed by classical assumption tests consisting of multicollinearity and heteroskedasticity tests, and hypothesis testing to determine whether the proposed hypotheses were accepted or rejected.

Empirical Model

Model 1:

$CETR_{it} = \beta_0 + \beta_1 BGD_{it} + \beta_2\ BSIZE_{it} + \beta_3\ BDEGREE_{it} + \beta_4\ SIZE_{it} + \beta_5\ DUMMY_{it} + \varepsilon_{it}$ …………….(1)

Model 2:

$DAit = \beta_0 + \beta_1 BGD_{it} + \beta_2\ BSIZE_{it} + \beta_3\ BDEGREE_{it} + \beta_4\ SIZE_{it} + \beta_5\ DUMMY_{it} + \varepsilon_{it}$ ……………....(2)

Model 3:

$CETRit = \beta_0 + \beta_1 BGD_{it} + \beta_2\ BSIZE_{it} + \beta_3\ BDEGREE_{it} + \beta_4\ DA_{it} + \beta_5\ SIZE_{it} + \beta_6\ DUMMY_{it} + \varepsilon_{it}$ ...(3)

Results and Discussion

Table 3. Descriptive Statistics

Variable	Obs	Mean	Max	Min	Stdev.
BGD	417	0,13	0,6	0	0,17
BSIZE	417	4,59	11	2	2,05
BEDU	417	0,39	1	0	0,26
SIZE	417	28,36	33,54	25,05	1,59
EM	417	0,09	4,27	-4,30	1,16
CETR	417	0,25	5,73	-3,17	0,77

Source : Data processed by author

On average, Indonesian manufacturing firms exhibit CETR values that do not suggest extreme tax avoidance behavior, although substantial variation exists across firms. Since CETR reflects the proportion of actual cash taxes paid relative to pre-tax income, lower CETR values indicate higher levels of tax avoidance, while higher CETR values reflect greater tax compliance. CETR is therefore an appropriate proxy for tax avoidance because tax planning strategies are primarily designed to reduce or defer tax outflows rather than merely after accounting-based tax expense, making CETR more closely aligned with firms' real tax payment behavior and management discretion in tax planning decisions (Sikes & Verrecchia, 2025). CETR ranges from -3,17 (PT. Asiaplast Industry Tbk, due to negative pre-tax income and excess tax payments) to 5,73 (PT. Kimia Farma Tbk, due to delayed receivables and low pre-tax profits). Although CETR may yield extreme values when firms experience negative pre-tax income, prior literature recognizes that such outcomes reflect economic conditions and tax timing effects rather than measurement error, and thus do not invalidate CETR as an indicator of cash-based tax avoidance behavior (Sanoran, 2025). The mean earnings management (EM) is 0,09, exceeding the 7,5% threshold (Roychowdhury, 2006), with values ranging from -4,30 to 4,27, reflecting variation in discretionary accruals and earnings quality across firms. Standard deviations indicate substantial heterogeneity among companies.

Corporate governance characteristics also vary. Female representation on boards averages 13%, with some firms lacking female directors entirely. Board size differs by firm scale, and directors with backgrounds in economics, accounting, or finance are generally underrepresented, as seen in several firms including PT. Harapan Duta Pertiwi, PT. Lautan Luas Tbk, and PT Multiprima Sejahtera. These patterns highlight considerable variability in both tax behavior and governance among Indonesian manufacturing firms. The dataset applied in this research has fulfilled the criteria of multicollinearity, normality test, and heteroskedasticity test.

Hypothesis Testing

Table 4. Hypothesis Testing and Decisions

Hypothesis	Independent Variable	Dependent Variable	Mediating Variable	Coefficient (t-statistic)	Decisions
Direct Hypothesis					
H1a	Gender Diversity	Tax Avoidance	-	0.38 (6.58)***	Supported
H1b	Board Size	Tax Avoidance	-	-0.01 (-0.41)	Rejected
H1c	Educational Background	Tax Avoidance	-	-0.35 (-7.96)***	Partially Supported
	Firm Size	Tax Avoidance	-	-0.02 (-2.06)**	Positive
	Year Effect	Tax Avoidance	-	-0.13 (-7.46)***	Positive
H2a	Gender Diversity	Earnings Management	-	-0.17 (-2.49)***	Supported
H2b	Board Size	Earnings Management	-	0.04 (1.11)	Rejected
H2c	Educational Background	Earnings Management	-	-0.15 (-3.36)***	Supported
	Firm Size	Earnings Management	-	-0.01 (-1.56)	Negative
	Year Effect	Earnings Management	-	-0.01 (-4.43)***	Negative
Indirect Hypothesis					
H3a	Gender Diversity	Tax Avoidance	Earnings Management	0.34 (5.92)***	Supported

H3b	Board Size	Tax Avoidance	Earnings Management	-0.04 (-1.22)	Rejected
H3c	Educational Background	Tax Avoidance	Earnings Management	-0.23 (-4.58)***	Rejected

***: Significant at the level 0.01
** : Significant at the level 0.05
Source : Data processed by author

The coefficient of determination provides an assessment of the explanatory power of each regression model. In the direct-effect model (Substructural I), the adjusted R-squared is 0.2383, indicating that approximately 23.83% of the variation in tax avoidance is explained by board gender diversity, board size, educational background, firm size, and year effects, while the remaining 76.17% is attributable to other factors not included in the model; the model is nevertheless statistically significant, with an F-statistic of 25.8986 and a probability of 0.0000. In Substructural II, the adjusted R-squared is 0.1056, indicating that approximately 10.56% of the variation in earnings management is explained by the board characteristics, firm size, and year effects, with the remaining variation potentially reflecting other factors outside the model; the model is statistically significant with an F-statistic of 10.3945 and a probability of 0.0000. Meanwhile, the mediation model (Substructural III) has an adjusted R-squared of 0.1729, indicating that approximately 17.29% of the variation in tax avoidance is explained by board characteristics, earnings management, firm size, and year effects, while the remaining 82.71% is explained by factors outside the model; this model is also statistically significant, with an F-statistic of 14.8672 and a probability of 0.0000. Overall, the moderate explanatory power of these models is reasonable because tax avoidance and earnings management are multidimensional firm-level outcomes that cannot be fully explained by board characteristics alone. The findings therefore indicate that board characteristics provide a meaningful contribution to explaining variation in tax avoidance and earnings management, although other firm-specific, managerial, financial, and institutional factors may also play an important role.

Taken together, the findings contribute to the board-tax avoidance literature by showing how board attributes translate into tax outcomes. In particular, gender diversity, measured as the percentage of female directors, is associated with lower tax avoidance indirectly through lower earnings management, suggesting that reporting discretion is a key channel linking governance to tax behavior. By contrast, board size is not associated with either earnings management or tax avoidance, while financially educated boards exhibit lower earnings management but higher tax avoidance, indicating that expertise may shift discretion toward sophisticated tax planning rather than accrual manipulation.

H1a shows that board gender diversity is negatively associated with tax avoidance, firms with a higher proportion of female directors exhibit lower tax avoidance. This finding is consistent with Lanis & Richardson (2018) and Riguen et al. (2020). It also aligns with upper echelon theory, suggesting that directors' characteristics shape discretionary decisions under uncertainty, including tax-related behavior (Hoseini et al., 2019 and Inneh et al., 2024).

H1b indicates that board size is not significantly associated with tax avoidance, consistent with Novita & Herliansyah (2019) and Omesi & Appah (2021). In Indonesia's two-tier governance system, the board of directors primarily executes strategy rather than serving as an independent monitoring body (Widodo & Widarjo, 2024), which may explain why differences in board size do not translate into different tax decisions. This null finding is theoretically meaningful from an upper echelon perspective, suggesting that tax avoidance is shaped more by directors' cognitive attributes and expertise than by structural features such as the number of directors (Mchugh & Duane, 2025).

H1c shows a positive association between directors' financial educational background and tax avoidance, boards with more members educated in economics, accounting, or finance exhibit higher tax avoidance. This is consistent with Lerum (2024) and Riguen et al. (2020), suggesting that financially expert directors are better able to identify and implement tax planning opportunities. In line with upper echelon theory, the result implies that educational background shapes directors' cognitive frameworks and strategic judgment, which may facilitate more sophisticated tax strategies (Kalbuana et al., 2023 and Elamer et al., 2024).

H2a indicates that a higher percentage of female directors is associated with lower earnings management, consistent with Mensah & Onumah (2023); Mnif & Cherif (2020) and Zalata et al. (2022) but not with Peni & Vähämaa (2010). This may reflect greater compliance orientation and risk aversion among female directors, which constrains opportunistic reporting discretion. In line with upper echelon theory, the result suggests that executives' ethical values and risk preferences shape earnings management (Shaikh et al., 2025).

H2b shows that board size is not significantly associated with earnings management, consistent with Githaiga et al. (2022) and Karagiannopoulou et al. (2025). One explanation is that larger boards may face coordination and transparency challenges, whereas smaller boards may suffer from weaker independence, producing offsetting effects on reporting discretion (Tran et al., 2023; Khatib et al., 2023). From an upper echelon perspective, this suggests that earnings management is shaped more by directors' cognitive attributes, expertise, and ethical judgment than by the number of directors (Danso et al., 2024; Alkebsee et al., 2025).

H2c finds a negative association between directors' financial education and earnings management, indicating that financially educated boards are less likely to engage in accrual manipulation. A plausible explanation is that expertise improves interpretation of accounting standards and strengthens adherence to professional norms, limiting opportunistic discretion (Lerum, 2024). This supports upper echelon theory that executives' cognitive frameworks and values shape discretionary reporting outcomes (Omesi & Appah, 2021; Ludigdo et al., 2025).

H3 shows that earnings management is positively associated with tax avoidance, indicating that higher discretionary accruals are linked to lower cash taxes paid relative to pre-tax income (CETR). This suggests that directors may use financial reporting discretion in ways that align with tax planning objectives, supporting earnings management as a key behavioral channel connecting reporting choices to tax outcomes (Itan et al., 2024).

The mediation results support H4a, board gender diversity (percentage of female directors) is indirectly associated with lower tax avoidance through lower earnings management, indicating that female representation constrains earnings manipulation and subsequent tax avoidance. In contrast, earnings management does not mediate the effects of board size or directors' educational background on tax avoidance (H4b-H4c). Overall, these findings support upper echelon theory by highlighting managerial discretion in financial reporting as the key mechanism linking board attributes to tax outcomes, rather than structural board features alone (Paramayuda et al., 2025; Türegün, 2025).

Conclusion

Based on the results, this study concludes that board diversity plays an important role in shaping corporate tax avoidance behavior. A higher proportion of female directors is associated with lower levels of tax avoidance, reflecting women's greater compliance orientation and risk aversion, whereas board size does not significantly influence tax avoidance. In contrast, directors' educational background shows a positive association with tax avoidance, indicating that higher or specialized education may equip directors with the knowledge to engage in more sophisticated tax planning strategies. The findings further indicate that gender diversity and educational background contribute to reducing earnings management, as female directors tend to act more cautiously and educational diversity introduces alternative perspectives that constrain opportunistic financial reporting. Moreover, earnings management is found to mediate the relationship between board gender composition and tax avoidance, while no such mediating effect is observed for board size or educational background. To build on these findings, future research should address current limitations by focusing more specifically on directors with financial or accounting expertise and by extending the analysis across different industries or economic periods to assess how contextual factors, such as regulatory changes or post-pandemic conditions, shape the relationship between board characteristics, earnings management, and corporate tax behavior. Future studies could also examine under what conditions earnings management functions as a mechanism linking board characteristics to corporate tax avoidance, particularly by considering differences in industry characteristics, regulatory environments, and periods of economic uncertainty.

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Author's Contribution

The authors contributed to the conceptualization and design of the study, development of the research methodology, data collection, data analysis, interpretation of the results, and preparation of the manuscript. All authors reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Conflicts of Interest

The authors declare that there are no conflicts of interest that could have influenced the research, authorship, or publication of this manuscript.

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