# Diversity Tax Nexus:
# An Investigation of Egyptian Listed Companies

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## Abstract

*This study examines the impact of board and audit committee diversity on tax avoidance, focusing on whether the presence of female board members, foreign board members, board size, CEO duality, and audit committee diversity (measured by the presence of female committee members) significantly affect tax avoidance in the Egyptian capital market. Thirty-four listed companies from EGX100 companies listed on the Egyptian Stock Exchange between 2015 and 2020. The paper uses GMM in the analysis of the impact of board and audit committee diversity on tax avoidance while controlling for firm size, leverage, return on assets, and external auditor. Findings indicate that the effective tax rates of the board and audit committee are lower, which results in a greater amount of tax avoidance. The results have a significant impact on policymakers interested in the determinants of and mechanisms to prevent tax avoidance. The implication is to exercise prudence when appointing female and foreign directors to the board of directors and to instead recommend their presence in audit committees in Egypt.*

***Keywords***: *Board Diversity, Audit committee Diversity, Tax avoidance, Egypt.*

## Introduction

In recent years, there have been international debates on the taxation policies of companies especially tax avoidance or aggressiveness and that of board diversity. It has been noted, in previous studies, that the composition of a company's board in terms of gender and professional background affects the company's taxation strategy, thus seeking to find out if having a diverse board might influence a company's tax evasion or aggressive tax practices.

This problem is especially pertinent in Egypt where there is increasing suspicion of tax corporate tax behavior. Egyptian companies have come under increased criticism for using most sophisticated tax planning schemes to ensure minimal tax payout causing arguments over tax law fairness and the amount of tax corporations pay to the country.

Recent studies of Badran (2024) for example, show that avoiding and aggressive taxation has become a norm amongst Egyptian businesses. However, there are such measures as tax evasion with the emphasis on reduction of taxes and gain of profits that are detrimental both to the economy and society.

Thus, in anticipation of such challenges, Egypt has introduced taxation policies and enforcement tactics that are expected to strengthen the corporate sector's governance to discourage tax evasive conducts. The usual measures-goal of strengthening tax regulations and its enforcement are in most cases not addressing the core

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issue-in addition to evasion there are ethics fundamentally altering income which should be the core business focus.

With those challenges, Egypt introduced a stricter set of tax protection policies and its enforcement, while emphasizing on corporate governance so that there will be measures to discourage avoidance of payment of proper tax liabilities on revenue earned. Tax avoidance has an impact not only financially, but also ethically directed practices, for instance shifting and enhancement of incomes and indeed corruption which based trust in society (Hudori & Mustikasari, 2020).

Although the Egyptian reality is like other societies, it is still in terms of the context where there are weak enforcement possibilities and changing patterns of governance. Therefore, the promotion of transparency, accountability and equal chances must be encouraged so that the tax system will be functional and promote stability over financial matters.

The issue of board and audit committee diversity is crucial in Egyptian tax literature as there is scant research regarding its impact on the level of tax avoidance practiced by companies in the country. However, potentially interesting relationships exist as previous work from other developing countries suggests. Moreover, international studies examining board characteristics offer inconsistent results, calling for more specific investigations.

According to the context of this study, it is distinct from previous research in that it is one of the first as it analyzes the direct impact of board and audit committee diversity on tax avoidance focusing entirely on the Egyptian market. While previous international studies have examined the correlation between board diversity and tax practices, such studies have not directly targeted Egypt. This is indeed an important gap, for Egypt is in transition with respect to its corporate governance practices and with respect to dealing with tax avoidance, enforcement, and transparency issues. Furthermore, the study provides a specific context in which the board's gender and professional diversity, among many other potential attributes, can affect a corporation's tax behavior, hence addressing an important gap in the literature.

## Research Objectives

In that regard, the core aims of this research includes examining the relationship that exists between the gender and ethnic diversities of the board and the audit committee with tax avoidance practices of companies operating in Egypt, Therein, the study seeks to examine how the existence of female directors, foreign directors, the board of directors size, the presence of CEO duality, and the diversity of the audit committee affects tax avoidance. More so, it attempts to establish the role of corporate governance mechanisms, such as board and audit committee diversity, on the firm level tax strategies of businesses in Egypt. The overall goal of this research is to augment comprehension of the factors leading to the avoidance of corporate tax liabilities in circumstances of enhanced corporate governance reforms in Egypt with a view of helping policymakers and practitioners to find ways of enhancing governance practices.

## Research Problem

The research problem addressed in this study is the lack of understanding of how board and audit committee diversity influences tax avoidance behaviors in Egyptian companies. Despite the growing concerns about aggressive tax planning in Egypt, there is limited empirical evidence exploring the role of diverse boards in shaping these tax strategies. Given the unique challenges of the Egyptian market, such as limited enforcement and evolving corporate governance standards, this study seeks to fill this gap and provide a deeper understanding of how board diversity may impact tax avoidance in the country.

Through an examination of 34 firms listed on the Egyptian Stock Exchange from 2015 to 2020, our findings reveal significant insights. An increase in female board members correlates positively with tax avoidance, suggesting their role is more advisory than supervisory in Egyptian-listed firms. Conversely, greater diversity in audit committees is associated with reduced tax avoidance, indicating their role in promoting oversight.

This paper is structured as follows: Section 2 reviews the relevant literature and develops hypotheses. Section 3 outlines the data and methodology used in the study. Section 4 presents the empirical results, followed by concluding remarks in Section 5.

## Theoretical Framework and Review of Previous Studies

Various empirical studies and theories suggest that a firm's tax strategies are influenced by the diversity within its corporate governance structures. This section synthesizes relevant literature to clarify how board and audit committee diversity shapes tax avoidance.

The "diversity of perspectives" hypothesis posits that decision-making processes improve when boards integrate a broader range of viewpoints. This diversity can lead to less aggressive tax avoidance by fostering more comprehensive discussions about tax strategies. For instance, research indicates that gender diversity on boards is associated with reduced tax avoidance, as diverse boards may prioritize ethical considerations and corporate social responsibility over aggressive tax practices (Jarboui et al., 2020; Budiman, 2023). Similarly, the presence of independent directors, who often bring diverse experiences and backgrounds, can further curb tax avoidance by enhancing governance and accountability (Budiman & Bandi, 2023; Hsu et al., 2018).

Audit committees also play a crucial role in this context. Committees composed of members from diverse professional backgrounds, particularly those with financial expertise, are believed to positively influence tax compliance. Research demonstrates a strong correlation between audit committees' competence and independence and reduced tax avoidance. This is because these committees are responsible for overseeing financial reporting and ensuring compliance with regulatory standards (Handoyo et al., 2022; Indayani, 2019; Primasari, 2023). Furthermore, the diversity within audit committees enhances their capacity to identify and challenge aggressive tax strategies, thereby increasing their effectiveness in preventing tax avoidance (Cahyati, 2023).

The "political connections" theory adds another layer to this discussion, suggesting that the political affiliations of board members and audit committees can influence tax avoidance behaviors. Studies reveal that firms with politically connected directors may engage in more aggressive tax avoidance, leveraging their connections to navigate regulatory environments (Alfandia, 2023). This dynamic underscore the complexity of how diversity manifests in governance structures and impacts tax strategies, as the benefits of diverse perspectives may be offset by politically motivated tax avoidance.

In conclusion, the relationship between tax avoidance and diversity within boards and audit committees is multifaceted. Diverse governance structures have the potential to reduce tax avoidance by fostering a culture of ethical decision-making and improving oversight. However, this relationship is complicated by the specific composition of these committees and the influence of political connections. To develop a deeper understanding of how diversity in corporate governance impacts tax strategies, future research should continue to explore these dynamics.

### *The impact of board and audit committee diversity on tax avoidance in the Egyptian context*

The relationship between board diversity and audit committee diversity is a topic of significant interest in corporate governance and financial practices, particularly within the Egyptian capital market. Numerous studies have highlighted the complex dynamics at play. For instance, Abdelfattah and Aboud (2020) examined how corporate governance, tax avoidance, and corporate social responsibility intersect in Egypt. Their study focused on the presence of family or foreign members on company boards as indicators of effective governance, offering insights into how board composition influences tax-related decisions.

Recently, the link between tax avoidance and diversity in boards and audit committees has attracted considerable attention, especially in emerging markets like Egypt. This analysis synthesizes recent studies to explore how diversity within these governance structures affects corporate tax strategies. It is hypothesized that diversity in audit committees, particularly gender diversity, contributes to improved oversight and reduced tax avoidance. For example, Riguen et al. (2021) demonstrated that the inclusion of women on boards correlates with lower levels of tax avoidance, promoting more ethical approaches to tax practices. Similarly, Jarboui et al. (2020) found that diverse perspectives in audit committees enhance scrutiny of financial practices, curbing aggressive tax strategies.

These findings are especially relevant in Egypt's unique regulatory and economic environment. The composition and expertise of audit committee members are often closely linked to their effectiveness in preventing tax avoidance. Research suggests that audit committees with a higher proportion of independent directors exhibit a stronger negative correlation with tax avoidance, as independent directors are less likely to face conflicts of interest that could encourage lenient tax practices (Damayanty, 2021). Thus, enhancing the independence and diversity of audit committees could be a viable strategy for reducing tax avoidance in Egyptian firms.

Robust corporate governance mechanisms, characterized by diverse and independent boards, also play a critical role in shaping tax behaviors. Organizations with such frameworks tend to engage less in tax avoidance, a particularly significant finding in Egypt, where corporate governance practices are still evolving (Tania & Mukhlasin, 2020). The inclusion of diverse viewpoints encourages thorough assessments of tax strategies, fostering ethical tax behavior and compliance (Karlinah et al., 2024).

The relationship between audit quality and board diversity is another key area of investigation. High-quality audits, often associated with diverse audit committees, can deter tax avoidance. Studies indicate that companies with diverse audit committees and strong audit quality are less likely to engage in aggressive tax practices, highlighting diversity's potential to enhance financial reporting integrity and audit committee effectiveness (Tahilia et al., 2022).

Beyond gender diversity, nationality and professional background also influence tax strategies. Boards with a diverse mix of nationalities are more likely to adopt conservative tax practices, as varied perspectives help navigate complex international tax regulations (Alshabibi et al., 2022). This is particularly relevant for multinational companies operating in Egypt.

While significant research has explored the relationship between tax avoidance and board diversity in various contexts, a notable gap remains in the Egyptian context. Egypt's distinctive socio-economic and regulatory environment may shape corporate governance and tax strategies differently than in developed markets. Existing studies, such as Riguen et al. (2020), highlight the impact of gender diversity on tax behavior, demonstrating that gender-diverse boards tend to reduce corporate tax avoidance by promoting ethical tax practices through increased scrutiny and diverse perspectives. However, studies specifically addressing this dynamic in Egypt are scarce.

The role of audit committees in corporate tax strategies is also crucial, particularly concerning their composition and diversity. While Hsu et al. (2018) found that audit committees' financial expertise is linked to greater tax avoidance, the influence of audit committee diversity on these dynamics in Egypt remains unclear. The current literature lacks sufficient exploration of how board and audit committee diversity intersect to shape tax avoidance strategies, representing a significant research gap in Egypt.

Corporate governance mechanisms have been shown to moderate tax avoidance in other regions. For instance, Aliani and Ali (2012) demonstrated that board independence and diversity significantly influence corporate tax planning in Tunisia, suggesting that similar dynamics may exist in Egypt. However, systematic investigations into the effects of board and audit committee diversity on tax avoidance within Egyptian firms remain limited, leaving critical gaps in understanding the interaction between governance and tax strategies.

The connection between tax avoidance and corporate social responsibility (CSR) adds another dimension to this discussion. Dakhli (2021) suggested that CSR activities might mediate the relationship between board gender diversity and tax avoidance, implying that diverse boards could promote socially responsible practices that influence tax strategies. However, the role of CSR in this relationship within Egypt remains largely unexplored, underscoring the need for localized research.

In summary, while the relationship between tax avoidance and diversity in boards and audit committees has been widely studied, significant gaps persist in the Egyptian context. The interplay between gender and nationality diversity, audit committee composition, corporate governance mechanisms, and cultural factors presents ample opportunities for further research. Addressing these gaps could provide policymakers, corporate leaders, and researchers with valuable insights, contributing to a more nuanced understanding of corporate tax behavior in Egypt.

***Based on the dentified research gaps, this study proposes to investigate the following hypotheses:***

- **Hypothesis 1**: Corporate tax avoidance is influenced by board diversity.
- **Hypothesis 2**: Corporate tax avoidance is influenced by audit committee diversity.

## Study Design:

***Study Methodology.***

This study employs a panel data analysis to explore the relationship between key variables over a specified period. The dataset comprises multiple observations across different entities, enabling the capture of both cross-sectional and time-series variations.

As an initial step, descriptive statistics will be calculated, including the mean, standard deviation, minimum, and maximum values for each variable. These summary statistics will provide valuable insights into the data distribution and highlight any notable variations or patterns. To complement this, a line plot will visually depict the general trends and behaviors of the variables over time, aiding in a clearer understanding of their temporal dynamics.

Following the descriptive analysis, the study will examine the linear relationship between tax avoidance and board diversity, while controlling for other explanatory variables. The Generalized Method of Moments (GMM), introduced by Arellano and Bond (1991), will be utilized due to its robustness in addressing violations of the normality assumption. GMM is favored over maximum likelihood estimation as it imposes fewer distributional assumptions, enhancing its applicability in empirical research. Specifically, system GMM will be applied, which improves efficiency by incorporating additional moment conditions and addressing potential issues such as heteroscedasticity and serial correlation.

To validate the robustness and reliability of the model, two essential diagnostic tests will be conducted: the Sargan-Hansen test for over-identification to assess the validity of the instrumental variables, and the Arellano-Bond test for autocorrelation to detect any serial correlation in the error terms.

***Study Community, sample and method of selection.***

The study community is comprised of all entities that were listed on the Egyptian Stock Exchange (EGX 100) between 2015 and 2020. Corporate tax practices were influenced by the implementation of a new anti-avoidance rule in 2014. Consequently, this time frame was chosen. Furthermore, the potential consequences of the COVID-19 pandemic in 2020 were considered, resulting in the exclusion of the years following

2020. A sample of 34 non-financial firms was selected from this community, representing a diverse range of sectors such as real estate, food and tobacco, tourism, pharmaceuticals, telecommunications, and more. A total of 204 observations from the firm's year were examined. The inclusion of firms was contingent upon the availability of complete data for the study period, while 66 firms were excluded because of incomplete data.

***Study Measures and Characteristics.***

The ratio of total cash taxes paid to pre-tax book income was employed to quantify tax avoidance, the primary objective of the study, in accordance with the methodology of Al Lawati and Hussainey (2021). The diversity of the board was evaluated using a variety of indicators, such as the number of foreign board members, the number of female board members, the size of the board, and the presence of CEO duality (in which the CEO also functions as the chairman). The presence of female members was used to measure the diversity of the audit committee, with a score of 1 indicating the presence of a female member and 0 indicating the absence of a female member. The study incorporated firm specific control variables, including profitability, leverage, firm size, and asset structure, all of which are recognized as influences on tax avoidance, to guarantee a comprehensive analysis as per Lanis and Richardson, (2018) and Lumanto et al., (2023).

The quality of external auditors was also analyzed as a control variable, with a particular emphasis on prominent audit firms that are less tolerant of aggressive tax practices due to potential legal risks and reputational concerns (Ng, 1978). The legal risk for auditors may increase if the board of directors holds them responsible for discrepancies in tax-related financial statements arising from aggressive tax avoidance practices (Donohoe and Knechel, 2014). Furthermore, the credibility of auditors may be compromised if tax authorities challenge an auditor's tax position, resulting in restatements. Prominent audit firms, known for their focus on reputational issues (DeAngelo, 1981), are expected to exhibit lower tolerance for clients' tax evasion. Auditors may face significant costs from their clients' tax fraud, including the risk of lawsuits, and reputational harm is further intensified when auditors are involved in preparing corporate tax returns. In such cases, auditors may even terminate audit contracts in subsequent years if tax authorities dispute the company's tax status.

***Study Data:***

The data utilized in this analysis is secondary data that was collected between 2015 and 2020. The Egyptian Stock Exchange (EGX) website and corporate annual reports were the sources of the information. The annual reports offered comprehensive insights into taxation, corporate governance, and firm-specific characteristics, while the EGX website provided general corporate and market data.

***Data Collection Tool:***

The corporate annual reports of the selected firms were the primary data collection instrument. These reports were instrumental in the measurement of the study variables, as they provided critical information on taxation, corporate governance practices, and firm-specific characteristics.

***Data Collection Method:***

The initial step in the data collection procedure was to identify eligible firms from the EGX 100 list for the years 2015 to 2020. Subsequently, the data completeness of the firms was assessed, and only those with complete records were included in the final sample. The data that was collected, which encompassed taxation, governance, and firm characteristics, was verified by conducting a cross-check between corporate annual reports and records from the EGX website. The authentication of foreign board members was conducted using their names, surnames, and physical appearance. The study guaranteed reliable analysis of tax avoidance practices among Egyptian corporations by implementing a meticulous collection and validation process that ensured resilient data quality.

### *Data Coding*

In this study, missing data will be addressed using appropriate imputation techniques to preserve the robustness and reliability of the analysis. Missing values are a common challenge in panel data, and the selection of the imputation method will be guided by the nature and pattern of the missingness. This careful approach is essential to minimize potential biases in the estimation process and ensure the integrity of the results. By employing suitable imputation techniques, the dataset will more accurately represent the true distribution of the variables, reducing the risk of erroneous conclusions arising from incomplete data.

***Table 1: Variable Measurement and Definition***

| Dependent Variable | Tax Avoidance (Total Cash Taxes Paid Over Pre-tax Book Income) | |
|---|---|---|
| Independent Variables | Board Diversity | Female Board Members (number of female members on board). |
| | | Foreign Board Members (number of foreign members on board). |
| | | Board Size (Total number of board members |
| | | CEO Duality (If it doesn't exist, a score of 0 is given, otherwise, 1). |
| | Audit Committee Diversity (measured in terms of the presence of female members, if they exist a score of 1 is given, otherwise 0). | |
| Control Variables | Firm Size (measured as of the log of total assets) | |
| | Leverage (measured as total debt divided by total assets) | |
| | ROA (measured as the Ratio of net income before extraordinary items plus interest expenses to total assets). | |
| | Asset Structure (measured as Fixed asset over total assets) | |
| | Audit (If the external auditor was a Big 4, then a score of 1 is given, otherwise 0). | |

## Data Analysis Method

### *Descriptive Statistics*

Table (1) describes the variables of this study's descriptive measures such as: mean, minimum, maximum, and standard deviation.

Tax avoidance ranges from a minimum of -4.50 to a maximum of 14.10, with a mean of approximately 0.21 and a standard deviation of 1.13. The number of female board members ranges from a minimum of zero to a maximum of 8, with a mean of approximately 1.04 and a standard deviation of 1.44. Similarly, the number of foreign board members ranges from a minimum of zero to a maximum of 9, with a mean of approximately 0.67 and a standard deviation of 1.72.

Board size ranges from a minimum of 4 to a maximum of 17, with a mean of approximately 8.28 and a standard deviation of 2.80. Firm size ranges from a minimum of 16.82 to a maximum of 25.34, with a mean of approximately 21.89 and a standard deviation of 2.17. Market leverage ranges from a minimum of -1,171.71 to a maximum of 28.62, with a mean of approximately -5.61 and a standard deviation of 86.08.

The return on assets (ROA) ranges from a minimum of -18.33 to a maximum of 0.93, with a mean of approximately -0.20 and a standard deviation of 1.90. Lastly, asset structure ranges from a minimum of 0.00 to a maximum of 15.78, with a mean of approximately 0.85 and a standard deviation of 2.14.

***Table (2): Descriptive Statistics of the Variables Overall***

| Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Tax Avoidance | 186 | -4.50 | 14.10 | 0.21 | 1.13 |
| Female Board Members | 186 | 0.00 | 8.00 | 1.04 | 1.44 |
| Foreign Board Members | 186 | 0.00 | 9.00 | 0.67 | 1.72 |
| Board Size | 186 | 4.00 | 17.00 | 8.28 | 2.80 |
| Firm Size | 186 | 16.82 | 25.34 | 21.89 | 2.17 |
| Market Leverage | 186 | -1171.71 | 28.6 | -5.61 | 86.08 |
| Return on Assets (ROA) | 186 | -18.33 | 0.93 | -0.20 | 1.90 |
| Asset Structure | 186 | 0.00 | 15.78 | 0.85 | 2.14 |

### *Correlation Analysis*

As for table (2), it can be concluded that there is no high correlation between explanatory variables as all correlation coefficients are less than 0.6.

***Table (3): Pearson's Correlation Coefficients***

| | Female Board Members | Foreign Board Members | Board Size | Firm Size | Market Leverage | Return on Assets (ROA) | Asset Structure |
|---|---|---|---|---|---|---|---|
| Female Board Members | 1 | | | | | | |
| Foreign Board Members | 0.108 | 1 | | | | | |
| Board Size | 0.529** | -0.062 | 1 | | | | |
| Firm Size | -0.209** | 0.109 | 0.154* | 1 | | | |
| Market Leverage | 0.001 | 0.026 | 0.008 | 0.033 | 1 | | |
| Return on Assets (ROA) | 0.085 | 0.049 | 0.146* | -0.002 | -0.005 | 1 | |
| Asset Structure | 0.099 | -0.091- | -0.065 | -0.321** | 0.001 | 0.015 | 1 |

** Correlation is Significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

### *System GMM*

The initial step in the analysis involves testing the linear relationship between tax avoidance and board diversity, while controlling for other explanatory variables. The Generalized Method of Moments (GMM) is employed as an alternative to static panel models, particularly in cases where the key assumption of normality for the error term (or dependent variable) is violated. In this study, the Jarque-Bera test was used to assess the normality assumption. The null hypothesis for the Jarque-Bera test posits that the data follows a normal distribution.

To further confirm this, the Shapiro-Wilk test for normality was conducted, with the results presented below:

***Table (4): Shapiro–Wilk W Test for Normal Data***

| Variable | N | W | V | z | Prob > z |
|---|---|---|---|---|---|
| Tax Avoidance | 186 | 0.240 | 106.490 | 10.701 | 0.000 |

Since the p-value (Prob > z) is 0.000, which is below the common significance level of 0.05, we reject the null hypothesis. This indicates that the tax avoidance variable significantly deviates from a normal distribution.

Given this violation of the normality assumption, GMM, introduced by Arellano and Bond (1991) and formalized by Hansen (1982), is a suitable alternative for estimation. GMM has become widely adopted in economics and finance due to its flexibility. Unlike maximum likelihood estimation (MLE), which requires full knowledge of the data's distribution, GMM relies solely on specified moments derived from the underlying model. Additionally, MLE can be computationally intensive, whereas GMM offers a more efficient estimation process. Another unique feature of GMM is its ability to test model specification when the number of moment conditions exceeds the number of parameters.

The original GMM estimator, known as difference GMM, eliminates fixed effects by differing the data. This approach utilizes the panel data structure to account for cross-sectional-specific effects and endogenous explanatory variables. Differencing the regression equation not only controls for fixed effects but also mitigates potential level effects. Both difference GMM and its enhanced version, system GMM, are particularly effective when the panel dataset includes many cross-sectional units (e.g., countries) and relatively few time periods (typically up to 20–25).

However, difference GMM has limitations in cases where time series are highly persistent. In such instances, the lagged levels of the series are weakly correlated with their first differences, resulting in weak instruments for the differenced equations. To address this issue, Arellano and Bover (1995) and Blundell and Bond (1998) introduced system GMM. This method improves upon difference GMM by incorporating additional moment restrictions, allowing lagged first differences to serve as instruments for level equations. System GMM estimates both differenced and level equations simultaneously, using distinct instruments for each, thereby correcting the biases inherent in the standard estimator.

### *Advantages of System GMM over Difference GMM*

- Incorporates additional moment conditions, enhancing efficiency.
- Provides greater robustness to heteroscedasticity and serial correlation.

Once the model is estimated, it is essential to evaluate its validity. Two key diagnostic tests are employed for GMM estimation:

1- **Sargan-Hansen Test:** This test assesses the validity of the instrumental variables by evaluating the over-identifying restrictions. The null hypothesis states that there is no over-identification. Failing to reject this null hypothesis indicates that the model is valid.

2- **Arellano-Bond Test:** This test checks for autocorrelation in the error terms. The null hypothesis posits no autocorrelation. Failing to reject this hypothesis confirms the model's validity.

### *First Model*

According to the above, the following two model is estimated,

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + + \sum_i \theta_i x_{it} + \varepsilon_{it} \dots (1)$$

Where:

- $Y_{it}$ = Dependent Variable (Tax Avoidance),
- $x_{it}$ = Explanatory Variables (Female Board Members, Foreign Board Members, Board Size, CEO Duality, Firm Size, Market Leverage, Return on Assets, Asset Structure, External auditor being from Big 4),
- $\beta_0$ = Intercept (Constant Term),
- $\theta_i$ = Slope Coefficients for $i^{th}$ Explanatory Variable,
- $\varepsilon_{it}$ = Error Term (with mean zero and constant variance).

***Table (5): Summary of the First Model***

| Dynamic Panel-data Estimation, Two-step System GMM | | | | |
|---|---|---|---|---|
| **Group Variable** | **CompanyID** | **Number of Observations** | **155** | |
| Time Variable | Year | **Number of Groups** | 31 | |
| Number of Instruments | 15 | **Observations per Group** | **Minimum** | 5 |
| Wald Chi2 (10) | 7866.110 | | **Average** | 5 |
| Prob > Chi2 | 0.000 | | **Maximum** | 5 |

The results are summarized in the previous table and according to these listed results, the p-value of the Wald Chi2 test equals 0.000 which is significant (less than 0.05). This means that there is at least one variable of the independent variables that has a significant effect on the tax avoidance.

It can be concluded that:

- The number of female board members and foreign board members both have a significant positive impact on tax avoidance at a 95% confidence level. These results align with Zudana et al. (2021), which supports the notion that female directors can influence corporate tax strategies, suggesting that their decision-making may lead to less aggressive tax avoidance.
- Board size has a significant negative impact on tax avoidance at a 99% confidence level. This finding is supported by Egbunike et al. (2021), which suggests that larger boards may lead to more complex decision-making processes that obscure accountability and oversight, ultimately facilitating tax avoidance strategies.
- Firm size has a significant positive impact on tax avoidance at a 99% confidence level. This is corroborated by studies such as Arnan & Kurnia (2022) and Utami & Supriadi (2023), which indicates that larger firms are more likely to engage in tax avoidance practices due to their greater resources and ability to exploit tax regulations effectively.

***Table (6): Coefficient of the First Model***

| Variable | Tax Avoidance |
|---|---|
| First Lag of Tax Avoidance | $-0.343^{***}$ (0.00637) |
| Female Board Members | $0.0160^{**}$ (0.00490) |
| Foreign Board Members | 0.0195 (0.02160) |
| Board Size | $-0.0333^{***}$ (0.01260) |
| CEO Duality | -0.0551 (0.06290) |
| Firm Size | $0.0625^{***}$ (0.01590) |
| Market Leverage | $0.000574^{***}$ (8.41e-05) |
| Return on Assets | $0.0172^{**}$ (0.00670) |
| Asset Structure | -0.008822 (0.00607) |
| External Auditor (Big 4) | -0.000293 (0.09030) |
| Constant | $-0.842^{***}$ (0.31200) |
| Observations | 155 |
| Number of CompanyID | 15 |

Standard Error in Parentheses

$^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.1$

- Market leverage has a significant positive impact on tax avoidance at a 99% confidence level. This is supported by Putri & Halmawati (2023), which demonstrates that firms utilizing debt financing are more likely to engage in tax avoidance activities.
- Return on assets (ROA) has a significant negative impact on tax avoidance at a 95% confidence level. Sari (2023) supports this finding, emphasizing that firms with lower profitability are more likely to seek ways to minimize their tax liabilities.
- There is no significant impact on tax avoidance from foreign board members, CEO duality, asset structure, or the external auditor being from the Big Four at a 90% confidence level, assuming all other independent variables remain constant. These findings are consistent with Sutrisno and Pirzada (2020). Recent studies consistently suggest that foreign board members, CEO duality, and the presence of external auditors from the Big Four do not significantly impact tax avoidance. However, the influence of asset structure and other factors may require further investigation.

In summary, these findings highlight the complexity of tax avoidance behaviors and suggest that other factors may play a more critical role in influencing corporate tax strategies.

The Arellano-Bond test suggests that there is no significant autocorrelation up to the second order in the residuals of the first model. Furthermore, the Sargan test indicates that the there is no overidentification problem which indicates the goodness of fit of the test.

***Table (7): Diagnostics Tests for the Second Model***

| **Arellano-Bond Test for AR(1)** | | **Arellano-Bond Test for AR(2)** | |
|---|---|---|---|
| **Z** | **Prob > z** | **z** | **Prob > z** |
| -1.10 | 0.272 | -0.94 | 0.349 |
| Sargan Test (not robust, but not weakened by many instruments) | | Sargan Test (robust, but weakened by many instruments) | |
| Chi2(13) | Prob > Chi2 | Chi2(13) | Prob > Chi2 |
| 2.67 | 0.446 | 1.83 | 0.176 |

***Second Model***

According to the above, the following two model is estimated,

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + + \sum_i \theta_i x_{it} + \varepsilon_{it} \ldots (1)$$

Where:

- $Y_{it}$ = Dependent Variable (Tax Avoidance),
- $x_{it}$ = Explanatory Variables (Audit Committee Diversity, Firm Size, Market Leverage, Return on Assets, Asset Structure, External Auditor Being one of the Big 4).
- $\beta_0$ = Intercept (Constant Term),
- $\theta_i$ = Slope Coefficients for $i^{th}$ Explanatory Variable,
- $\varepsilon_{it}$ = Error Term (with mean zero and constant variance).

The results are summarized in the previous table and according to these listed results, the p-value of the Wald Chi2 test equals 0.000 which is significant (less than 0.05). This means that there is at least one variable of the independent variables that has a significant effect on the tax avoidance.

Audit committee diversity has a significant negative impact on tax avoidance at a 99% confidence level. This finding aligns with Putri (2024), which indicates that a well-composed audit committee can effectively minimize tax avoidance. This supports compliance theory, which posits that stronger governance structures lead to better adherence to tax regulations.

Firm size has a significant positive impact on tax avoidance at a 95% confidence level. This is consistent with Arnan and Kurnia (2022), who

***Table (8): Summary of the Second Model***

| **Dynamic Panel-Data Estimation, Two-Step System GMM** | | | | |
|---|---|---|---|---|
| **Group Variable** | **CompanyID** | **Number of Observations** | **155** | |
| Time Variable | Year | **Number of Groups** | 31 | |
| Number of Instruments | 11 | **Observations per Group** | **Minimum** | 5 |
| Wald Chi2 (10) | 75.090 | | **Average** | 5 |
| Prob > Chi2 | 0.000 | | **Maximum** | 5 |

highlight that firm size is a critical factor in determining a company's tax avoidance strategies. Larger firms are more likely to engage in tax avoidance practices due to their greater resources and ability to exploit tax regulations effectively.

Market leverage has a significant positive impact on tax avoidance at a 99% confidence level. This result is supported by Nurrobani (2023), which indicates that firms utilizing debt financing are more likely to engage in tax avoidance activities. The interest payments on debt reduce taxable income, thereby incentivizing tax avoidance behaviors.

Return on assets (ROA) has a significant negative impact on tax avoidance at a 99% confidence level. This finding is consistent with Wiratno et al. (2021), which reinforces the notion that higher profitability leads to greater tax obligations, reducing incentives for tax avoidance.

Asset structure has no significant impact on tax avoidance, as supported by Djatnicka (2023), which suggests that asset structure may not be a critical determinant of tax avoidance.

There is no significant impact of the external auditor being one of the Big Four on tax avoidance, as indicated by Amalia and Ferdiansyah (2019). This research demonstrates that hiring external auditors from Big Four accounting firms does not significantly affect tax avoidance. These findings are reported with 90% confidence, assuming all other independent variables remain constant.

***Table (9): Coefficient of the Second Model***

| Variable | Tax Avoidance |
|---|---|
| First Lag of Tax Avoidance | $-0.482^{*}$ (0.263) |
| Audit Committee Diversity | $-0.648^{***}$ (0.238) |
| Firm Size | $0.0804^{**}$ (0.0343) |
| Market Leverage | $0.000532^{***}$ (8.86e-05) |
| Return on Assets | $0.00421^{***}$ (8.38e-05) |
| Asset Structure | 0.0138 (0.0237) |
| Audit | 0.546 (0.343) |
| Constant | $-1.404^{**}$ (0.697) |
| Observations | 155 |
| Number of CompanyID | 15 |

Standard Error in Parentheses

$^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.1$

## Conclusion and Recommendations

The Egyptian context reveals a multifaceted interplay of factors influencing corporate governance and tax behavior, particularly regarding board and audit committee diversity and tax avoidance. Findings from this study suggest that diverse audit committees and boards can significantly reduce tax avoidance practices by enhancing oversight and decision-making processes. Specifically, board composition-with an emphasis on the presence of foreign members and gender diversity-impacts tax strategies. Such diversity encourages a broader range of perspectives, potentially leading to more prudent tax planning and improved risk management (Budiman & Bandi, 2023).

These outcomes align with the idea that diversity fosters deeper discussions on corporate governance issues, including tax compliance and avoidance strategies.

However, the evidence does not uniformly support the notion that increased diversity directly results in reduced tax avoidance. The study indicates that the effectiveness of diversified audit committees and boards in mitigating tax avoidance may depend on other factors, such as firm-specific characteristics (Mnif, 2023). Thus, while diversity is an important consideration, it must be evaluated within the broader context of external influences on corporate governance.

## Recommendations

Given these findings, several recommendations can be made for Egyptian firms aiming to enhance their corporate governance practices and reduce tax avoidance:

To enhance corporate governance and improve tax oversight, companies should prioritize establishing diverse audit committees and boards. These committees and boards should reflect a broad range of professional backgrounds, genders, and experiences, as such diversity fosters more effective decision-making. A diverse leadership team can contribute to better management of tax strategies, ensuring that organizations are more accountable and transparent in their tax practices.

Investing in training and development is also crucial. Organizations should offer targeted training programs for board and audit committee members to improve their understanding of tax regulations and compliance requirements. By equipping them with the knowledge to navigate complex tax landscapes, companies can reduce the risk of non-compliance and make better-informed decisions regarding their tax strategies.

In addition, regulatory bodies in Egypt should take steps to promote diversity within corporate governance frameworks. Policies should be implemented that encourage the representation of women and other underrepresented groups on audit committees and boards. Setting standards for minimum representation would not only strengthen governance but also align with global best practices, creating a more inclusive and effective corporate structure.

The study has certain limitations. One significant constraint was the unavailability of data for some variables included in the model, which restricted the sample size to only 34 listed companies. Additionally, while the study could have examined a more recent period post-2020, the data collection was deliberately limited to the pre-pandemic period to exclude the impact of the COVID-19 pandemic. Future research focusing on the post-pandemic period may yield different insights within this context.

Thus, conducting ongoing research and monitoring is essential to assess the impact of board and audit committee diversity on tax avoidance. Continuous studies would provide valuable insights into the effectiveness of governance reforms, enabling companies to identify and adopt best practices. By tracking these developments, organizations can adjust their strategies to foster a more effective and transparent tax environment in Egypt.

In conclusion, fostering a culture of transparency and accountability can significantly help Egyptian firms navigate the complexities of tax compliance and avoidance, ultimately contributing to a more equitable tax system. Board and audit committee diversity offers a valuable opportunity to reduce tax avoidance in Egypt. However, it is essential to consider the broader corporate governance landscape and the unique contexts in which firms operate. By implementing strategies that enhance diversity and strengthen governance practices, Egyptian companies can not only improve tax compliance but also contribute to sustainable economic development, ensuring long-term prosperity for both businesses and the nation.

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