

THE IMPACT OF BOARD DIVERSITY ON AGGRESSIVE TAX PLANNING IN GCC COUNTRIES: DOES THE DIGITAL TRANSFORMATION MATTER?

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Abstract

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In light of the growing concern of governments and society about aggressive tax behavior, which poses ethical questions and conflicts with their interests, this study is designed to investigate the relationship between board diversity and aggressive tax planning in commercial banks in the Gulf Cooperation Council (GCC) countries. It also examined the moderating effect of digital transformation on the former relationship. The study adopted 814 observations from GCC countries' banks from 2010 to 2020. Ordinary least squares (OLS) and generalized method of moments (GMM) were used to test the hypotheses. Normative (OLS) and dynamic (System-GMM) estimates indicate a consistent pattern whereby board diversity, specifically multiple memberships, gender diversity, and financial expertise, is linked to a significant decrease in the intensity of aggressive tax planning in GCC banks. These findings confirm that combining effective governance with digital transformation can constitute a dual strategy to enhance tax compliance, especially in emerging market environments experiencing rapid developments in digital infrastructure, such as the GCC countries.

Keywords: Board Diversity, Aggressive Tax Planning, Digital Transformation, GCC Countries

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1. INTRODUCTION

Aggressive tax planning has garnered increasing attention not only in political and academic circles but also among the general public, as the media has highlighted the tax avoidance practices of large

corporations such as Apple, Facebook, and Starbucks in this area (Karagiorgos et al., 2019). The study of Kovermann and Velte (2019) have shown that aggressive tax planning is prevalent in the global corporate sector, while other companies are committed to paying high tax rates annually.

This disparity raises questions about why some companies avoid taxes despite the legal opportunities available to reduce them. Previous studies also revealed the reason behind companies' behavior toward engaging in varying degrees of aggressive tax planning (Zhang et al., 2022). Companies may use aggressive tax planning strategies to redirect resources that could otherwise be transferred to the state for their development, reducing their cash outflows and enhancing net profits (Zhang & She, 2024). Aggressive tax planning refers to the strategies companies employ to reduce their tax liabilities through legal but ethically controversial methods. These practices can undermine competitiveness in markets and undermine revenues, particularly in countries that rely heavily on natural resources, such as the Gulf Cooperation Council (GCC) countries (Dowling, 2014). Furthermore, aggressive tax planning can be implemented in the GCC in two ways: legal tax planning, i.e., efforts to reduce a company's tax burden by exploiting loopholes in tax provisions. Second, unlawful tax planning is when a business breaks tax laws in order to lower its tax bill (Utaminingsih et al., 2022).

Board diversity is an important factor that may influence tax evasion practices, potentially curbing or encouraging aggressive tax strategies (Alotaibi & Al-Dubai, 2024; Muttaqi & Nur, 2025). Therefore, the relationship between board diversity and aggressive tax planning is controversial (Pavlou et al., 2025). Although board characteristics are a prominent issue on the international agenda of various institutions promoting ethical corporate practices in developed countries (Aliani & Zarai, 2012), there is a dearth of empirical research scenarios that investigate the impact of board diversity — in terms of leadership, size, multiple memberships, diversity of competencies, gender diversity, and financial expertise — on aggressive corporate tax planning (Sarhan et al., 2024). Furthermore, to date, the moderating effect of board characteristics, such as gender diversity, independence, and size, on aggressive tax planning has not been empirically studied (Sarhan et al., 2024). This fact creates a compelling research context for this study. In particular, corporate boards' aggressive tax planning stems from the desire to generate high residual profits after meeting tax obligations by mitigating the company's tax burden (Utaminingsih et al., 2022). Within the framework of agency theory, board diversity in terms of independence, size, and quality acts as a powerful check, reducing the propensity for aggressive tax planning by reducing executive opportunistic behavior (Pavlou et al., 2025). Furthermore, board diversity broadens the range of skills, information, and knowledge within the board, fostering a more profound understanding of and consideration of the interests and perspectives of diverse stakeholders. Consequently, companies with diverse boards are less likely to engage in aggressive tax planning practices (Elgharbawy & Aladwey, 2025).

Moreover, digital transformation has emerged as an influential organizational component that may reshape the relationship between board diversity and tax behavior. Studies have shown that digital transformation may mitigate or enhance the impact of board characteristics on tax planning trends,

depending on the level of interaction between traditional governance and digital technology (Zhang & She, 2024). In this regard, banks' commitment to digital innovations and technologies may significantly influence their aggressive tax planning behavior, particularly when faced with a tax environment and a strict digital transformation. Although corporate tax planning is legal, it is often viewed as a form of financial crime that involves the use of sophisticated strategies to minimize tax liabilities, raising serious ethical concerns and undermining public trust in financial institutions (Souguir et al., 2025). Furthermore, research by Zhang and She (2024) confirms that digital transformation has become a key means of enhancing transparency and tax compliance and reducing the opportunities for aggressive tax planning by accelerating the flow of information and its electronic analysis, which supports the role of diverse boards in monitoring and oversight. Therefore, this study looks at how board diversity affects a company's willingness to do aggressive tax planning and how digital transformation can change this connection when it is used as a moderating variable.

The rest of the paper is organized as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 presents the research methodology. Section 4 provides the data analysis. Section 5 discusses the main findings. Section 6 concludes the paper providing the implications, limitations, and future directions for study.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.2. Literature review

Taxes are an important resource that provides public budgets with the revenues needed to provide services and achieve economic justice. They also play a significant role in achieving community cooperation and driving sustainable development in all countries (Gribnau & Jallai, 2018). In recent years, tax behavior has received increasing attention from politicians and society, challenging the traditional view of businesses that consider taxes a cost that must be reduced. This is morally wrong since it goes against what is best for society as a whole (Scarpa & Signori, 2023). Taxes are one of the biggest issues businesses face when it comes to their finances, meaning they have little money available to distribute to shareholders as dividends (Pavlou et al., 2025). Companies use tax planning strategies to minimize these liabilities and maximize the company's financial resources. These strategies improve company performance and reduce financial risks (Gabrielli & Greco, 2023). Tax planning is a legal method of avoiding paying taxes with the goal of maximizing profits after deductions. On the other hand, abusive tax planning is the opposite of tax evasion and goes against the spirit of the law (van de Vijver & Cassimon, 2020). Aggressive tax avoidance is when people read the law very strictly and literally, take advantage of legal loopholes, tax issues that are not clear, and differences between tax systems in various countries (Scarpa & Signori, 2023).

The Organization for Economic Co-operation and Development estimates that global tax revenue losses are between US\$100 and US\$240 billion annually. However, Kovermann and Velte (2019) point out that companies' success in tax avoidance can benefit shareholders. This benefit depends on the quality of the company's governance system, which aims to ensure that investors receive the highest returns on their investments. This means that company governance can either make it harder or easier to use random tax tactics (Pavlou et al., 2025). It is a key part of figuring out and making sense of tax planning. Because of what was said above, corporate governance has become a hot subject in tax planning.

On the other hand, the concept of digital transformation has recently emerged as an infrastructure for changing business models within companies and has played a significant role in facilitating administrative procedures, reducing errors, and improving the accuracy of financial reports (Hamdy et al., 2025). It is a driver of economic development and plays a prominent role in consumption, production, investment, and employment (Han et al., 2023). Engagement with digital technology impacts many traditional processes and can reduce information asymmetries and prevent earnings manipulation activities (Wang & Hou, 2024). Oanh et al. (2025) indicate that digital transformation directly and positively impacts the quality of accounting information. Digital transformation enables companies to optimise and reorganize production factors by integrating digital resources and enhancing governance levels (Zhang & She, 2024). Furthermore, governments across the globe have invested significant effort in digitizing tax administrations, particularly through the use of e-invoices, digital payments, and other technologies that provide tax administrations with more data and make information relevant to corporate governance more transparent, significantly impacting tax planning decisions (Xie & Huang, 2023).

2.2. Hypotheses development

2.2.1. Leadership and aggressive tax planning

A chief executive officer (CEO) promoter means the CEO is the firm's promoter, "the founder of the firm or a member of the founding family" (Faleye, 2014; Jackling & Johl, 2009). The prior studies indicate that financial risk is likely to decrease when the CEO serves as the bank's promoter and is the sole executive member of the board (Javed et al., 2024; Ozdemir et al., 2022). This is consistent with agency theory, which contends that a leadership structure of this nature can reduce agency costs by harmonising the interests of management with those of shareholders (Panda & Leepsa, 2017). A CEO-promoter will likely understand the organization's strategic objectives, enabling cohesive and timely decision-making. This leadership configuration improves access to essential resources and external networks. The CEO, as the bank's promoter, can utilize relationships and expertise to enhance organizational stability and resilience (Wijethilake et al., 2015). The absence of additional executive members on the board may

restrict diversity in perspectives and strategies, essential for thorough problem-solving and sustained success (Torchia et al., 2015). The study shows that these leadership systems work in different ways. But this concentration of authority might also make it harder for independent scrutiny to happen, which could lead to worries about managers becoming entrenched and less accountable (Dirman, 2020). Therefore, although unified leadership can help lower financial risk right away, it might also need more ways to keep authority in check to lower the hazards of having too much power (Shattock, 2013). Given this backdrop, there is a need to understand the relationship between the CEO promoter and corporate tax avoidance, as tax management decisions now rest with the board. However, the studies that examined the relationships between CEO promoters and corporate tax avoidance are still limited and inconclusive. The legitimacy theory suggests that a CEO promoter may deter tax avoidance given the need for reputation on the part of the dominant person (Duan et al., 2018; Lanis et al., 2022). Thus:

H1: CEO leadership will affect aggressive tax planning negatively.

2.2.2. Board size aggressive tax planning

Resource dependence theory states that the board of directors acts as a bridge between the firm and its external environment. Furthermore, a larger board is expected to have better experience, skills, and knowledge; broader access to resources; and enhanced capabilities to address external opportunities (Hunjra et al., 2020). There is some evidence that the size of a board affects tax planning, although not all of it is clear. Shamil et al. (2024) discovered that larger boards were linked to better tax planning for a group of Canadian corporations. They said this was because the boards had more diverse points of view and better monitoring. Another study indicated that companies with larger boards in Indonesia have stronger tax governance and lower tax liabilities, and broader strategic input. Larger boards were also more likely to use tax methods that were organised and followed the rules (Iazzi et al., 2023). Our research suggests that a bigger board of directors is more diversified and can handle complicated and long discussions on money. Therefore, the study hypothesized that:

H2: Board size will affect aggressive tax planning negatively.

2.2.3. Multiple directorships and aggressive tax planning

Another characteristic of a board of directors is that directors may occupy positions on more than one board (multiple directorships). In particular, multiple directorships allow directors to be affiliated with other companies (Ahn et al., 2010). Prior studies reported that having multiple directorships increases the monitoring quality as more networks are expected to generate benefits due to the diffusion of needed resources (Fama & Jensen, 1983; Garg, 2013). Building from this perspective, these directors could help to attenuate agency costs

that are motivated by agency conflicts, and they may offer valuable insights, best practices, and strategic guidance gleaned from their experiences across different industries and organisations, which can help mitigate financial risks and identify growth opportunities (Ahn et al., 2010). Research has explored various aspects of this relationship, including financial performance, innovation, risk-taking, and strategic decision-making (Jackling & Johl, 2009). In this regard, multiple board members can also have a negative impact on tax evasion, as directors who hold positions on multiple boards come from diverse backgrounds, making them more effective in managing the companies they serve. This diverse background may enhance the director's ability to provide appropriate advice to management (Hillman & Dalziel, 2003). Therefore, multiple board memberships may provide a significant incentive to monitor and reduce aggressive tax planning due to the diversity of experience resulting from having held positions in other companies (Iazzi et al., 2023). Therefore:

H3: Multiple directorships will affect aggressive tax planning negatively.

2.2.4. Competency diversity and aggressive tax planning

In the effort of discharging superior board governance function, numerous studies suggest that the acumen of the board can function as a control mechanism, as their involvement is essential in recognizing risks that may jeopardize shareholder interests, thereby enhancing the board's oversight function (Jensen & Meckling, 1976; Sarwar et al., 2018). According to agency theory, banks ought to appoint independent directors who possess adequate expertise in the bank's principal financial operations to facilitate effective governance and oversight, as enhanced board competency would unequivocally reduce risk profiles (Minton et al., 2014). Given the importance of board competency, it is important to consider the relationship between board competency and aggressive tax planning. Legitimacy theory suggests that a more diverse board can balance the tax team's enthusiasm with ethical and reputational considerations (Elgharbawy & Aladwey, 2025). Furthermore, the diversity of experience and skills on the board generates broader perspectives on risk and compliance (Chaudhry et al., 2020). Based on the above, it can be argued that board competency enables it to accurately identify tax risks and constraints. Therefore:

H4: Competency diversity will affect aggressive tax planning negatively.

2.2.5. Gender diversity and aggressive tax planning

Recently, due to numerous corporate scandals, governments and policymakers in major countries have been working to enhance women's representation in corporate decision-making bodies. The European Commission has started to encourage long-term gender diversity in the governance structure of listed firms. For example, it wants to raise the number of women on boards of directors to 40% (Iazzi et al., 2023). Having a diverse board of directors helps organizations gain a better picture of their business so they can make better choices (Jiang

& Kim, 2015). Previous studies have shown that female directors effectively monitor the opportunistic behavior of other managers and make continuous efforts to improve the quality of financial reporting by identifying transactional errors in financial statements (Al-Matari, 2022). In the context of tax evasion, Utaminingsih et al. (2022) found that gender diversity had a significant negative impact on aggressive tax planning in Indonesian companies over the period 2015–2020. Jarboui et al. (2020) also found that the more women on the board, the less tax evasion. We propose that the reason for the negative association between gender diversity and aggressive tax planning is that boards with more women promote transparency and disclosure, place greater emphasis on compliance with laws and regulations, and pay greater attention to ethical and reputational risks. Accordingly, the study suggests:

H5: Gender diversity will affect aggressive tax planning negatively.

2.2.6. Board financial expertise and aggressive tax planning

The board of directors has members who hold a degree in one of the following fields: accounting, auditing, finance, or management. These members also have experience in accounting and administrative work (Sadaa et al., 2023). EL Ammari (2022) says that in an environment that changes quickly, financial professionals are more likely to underestimate risks than non-financial experts. Members who know a lot about money help the board do its job by improving their grasp of how to analyze financial statements (Mollah et al., 2021). However, previous studies have not examined the potential impact of financial expertise on aggressive tax planning. Salihu and Kawi (2021) examined the relationship between financial literacy on the board of directors and tax evasion; the financial expertise of all members remains unexplored. A board of directors with a large number of members with financial expertise may be more effective in performing its oversight duties; thus, monitoring and reducing aggressive tax evasion practices may reduce concerns regarding the legitimacy of the company. Therefore:

H6: Financial expertise will affect aggressive tax planning negatively.

2.2.7. Digital transformation as a moderating effect between board diversity and aggressive tax planning

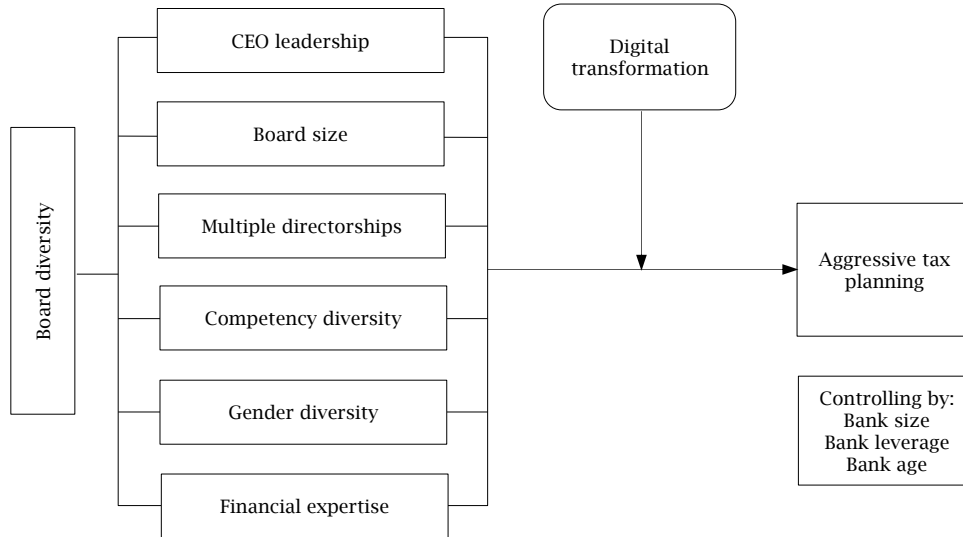
Agency problems arise from information asymmetry between management and investors, particularly regarding earnings (Bawuah, 2024). Conflicts of interest can cause management to implement tax practices that are inconsistent with shareholder preferences. Management uses tax planning to reduce the tax burden and maximize financial resources, which improves firm performance (Gabrielli & Greco, 2023). Aggressive tax practices exploit legal loopholes and uncertain tax situations (Scarpa & Signori, 2023). Board effectiveness plays an important role in reducing management's opportunistic incentives. Governance research shows that having a diverse board may greatly cut down on aggressive tax behavior (Pavlou et al., 2025). Also,

because aggressive tax planning is so complicated and difficult to understand, digital transformation may help make collecting, storing, and processing information better, which will make it more accurate and reliable (Xie & Huang, 2023). Digital transformation can also help lower the difficulties that arise between management and shareholders and push management to rethink the risks and

rewards of aggressive tax planning (Pavlou et al., 2025). So, digital change can have a big effect on judgments about aggressive tax planning. Given the preceding discussion:

H7: Digital transformation will interact with the relationship between board diversity and aggressive tax planning.

Figure 1. Theoretical framework



Source: Authors' elaboration.

3. DATA AND METHODOLOGY

3.1. Data collection

The study relies on listed companies in the six GCC countries (Kingdom of Saudi Arabia, Kuwait, Bahrain, Oman, the United Arab Emirates, and Qatar). The OSIRIS, ThomsonOne, and World Bank databases were used to obtain data on negative tax planning and corporate governance. Furthermore, published annual reports were used to collect data on digital transformation and any other missing data. Based on previous studies, we exclude non-financial companies and insurance companies due to the different characteristics of their financial statements (Klein, 2002). Non-financial companies and insurance companies are subject to different regulations, corporate governance rules, and other regulatory provisions than banks. Due to the differences in regulations and laws, and regulations between banks and other companies, this study excluded other companies to ensure consistency of observations (Alqatamin et al., 2017). Specifically, our study used banks listed in the six GCC markets for the period 2010 to 2020. The reason for choosing this period is that the GCC countries experienced significant growth in oil prices during 2010. Furthermore, in 2010, Arab markets recovered from the global financial crisis of 2008. The study was also paused until 2020 to avoid the negative effects of the COVID-19 pandemic, which has ravaged countries worldwide. The primary sample included 128 banks listed in the six markets. Islamic banks were excluded to reduce study bias, especially since Islamic banks have specific governance systems based on Shariah

law. A number of banks were also excluded due to data inadequacies. Therefore, the final sample for the study is 74 non-Islamic banks, resulting in 814 bank-year observations for the period 2010–2020.

3.2. Measurements

Aggressive tax planning: Aggressive tax planning is measured through the effective tax rate (ETR), consistent with prior research on the topic (Elgharbawy & Aladwey, 2025; Jarboui et al., 2020). According to Desai and Dharmapala (2006), the cash ETR is defined as the ratio of cash taxes paid to pre-tax accounting income. This study adheres to Watson (2015), who posits that cash-ETRs are commonly recognised in accounting literature as indicators of tax avoidance, as they encompass both permanent and temporary tax avoidance strategies. The cash-ETR is the ratio of a firm's total tax expense to its pre-tax income:

$$ETR = \frac{\text{Tax expense}}{\text{Pretax income}} \quad (1)$$

Board diversity: CEO leadership is measured using two measures: "CEO promoter", 1 if the CEO is the bank's promoter (founder of the firm or belongs to the founding family); else 0. Also, the CEO being the only employee, the study uses 1 if the CEO is the only employee (executive) sitting on the board, else 0 (Faleye, 2014; Jackling & Johl, 2009). Board size is measured using the total number of board members (Abbas et al., 2025). Multiple directorships is the proportion of directors on the board with directorships in other companies to the total number of directors on the board of the company

(Jamaludin et al., 2015). Gender diversity is measured by Blau's index. The range of Blau's index for gender diversity is from 0 if only one gender (male or female) is on the board of directors to 0.50 if an equal number of males and females is on the board of a company (Yousaf et al., 2021). Competency diversity is also measured using Blau's index. Five groups of expertise, which are financial, engineering, legal, management, and other expertise. The value of Blau's index for competency diversity ranges from 0 when only one expertise in the board to a maximum of 0.80 when all expertise is equally represented on the board (Ali et al., 2023). Financial expertise is measured using the number of board directors with financial expertise divided to total board members (Sadaa et al., 2023).

Digital transformation: The level of digital transformation is measured based on the frequency of terms related to digital transformation (e.g., artificial intelligence, blockchain technology,

cloud computing, big data, and digital technology applications) found in the banks' annual reports (Na et al., 2022; Wu & Liu, 2025). To solve heteroscedasticity, we used a logarithm for the frequency of terms related to digital transformation.

Control variable: Bank size is the logarithm of the bank's total assets during the year, financial leverage is the total liabilities divided by total assets, while the age is the number of years the bank has been in existence since its establishment until the last year of data collection (Ahmed, Ganesan, et al., 2021; Hazzaa et al., 2024; Sadaa et al., 2020).

3.3. Models

Using the following mathematical models, we can express the research regression equations:

$$ATP_{t,i} = \beta_0 + \beta_1 SIZE_{t,i} + \beta_2 LEVERAGE_{t,i} + \beta_3 AGE_{t,i} + \beta_4 CEO1_{t,i} + \beta_5 CEO2_{t,i} + \beta_6 BS_{t,i} + \beta_7 MD_{t,i} + \beta_8 CD_{t,i} + \beta_9 GD_{t,i} + \beta_{10} FE_{t,i} + \varepsilon_{t,i} \quad (2)$$

$$ATP_{t,i} = \beta_0 + \beta_1 SIZE_{t,i} + \beta_2 LEVERAGE_{t,i} + \beta_3 AGE_{t,i} + \beta_4 CEO1_{t,i} + \beta_5 CEO2_{t,i} + \beta_6 BS_{t,i} + \beta_7 MD_{t,i} + \beta_8 CD_{t,i} + \beta_9 GD_{t,i} + \beta_{10} FE_{t,i} + \beta_{11} DT_{t,i} + \beta_{12} CEO1 \times DT_{t,i} + \beta_{13} CEO2 \times DT_{t,i} + \beta_{14} BS \times DT_{t,i} + \beta_{15} MD \times DT_{t,i} + \beta_{16} CD \times DT_{t,i} + \beta_{17} GD \times DT_{t,i} + \beta_{18} FE \times DT_{t,i} + \varepsilon_{t,i} \quad (3)$$

where,

- *ATP* is aggressive tax planning;
- *SIZE* is bank size;
- *LEVERAGE* is bank leverage;
- *AGE* is bank age;
- *CEO1* is CEO promoter;
- *CEO2* is CEO only employee;
- *BS* is board size;
- *MD* is multiple directorships;
- *CD* is competency diversity;
- *GD* is gender diversity;
- *FE* is financial expertise.

4. DATA ANALYSIS

4.1. Descriptive statistics

Descriptive statistics indicate that the average aggressive tax planning is 0.019, meaning that the average tax avoidance in the GCC banks is 2%. Other averages were 1.58, 0.27, 0.083, 9.13, 0.165, 0.414, 0.068, 0.237, USD 6,287,388, 0.058, and 15.307 for *DT*, *CEO1*, *CEO2*, *BS*, *MD*, *CD*, *GD*, *FE*, *SIZE*, *LEVERAGE*, and *AGE*, respectively.

Table 1. Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
<i>ATP</i>	814	-0.019	0.164	-0.482	0.935
<i>DT</i>	814	1.58	0.794	0.000	2.882
<i>CEO1</i>	814	0.271	0.528	0.000	1
<i>CEO2</i>	814	0.083	0.229	0.000	1
<i>BS</i>	814	9.13	1.827	5	15
<i>MD</i>	814	0.156	0.183	0.000	8
<i>CD</i>	814	0.414	0.084	0.085	0.724
<i>GD</i>	814	0.068	0.082	0.000	0.215
<i>FE</i>	814	0.237	0.145	0.128	0.911
<i>SIZE</i>	814	6,287,388	18,579,105	52,549	148,728,721
<i>LEVERAGE</i>	814	0.058	0.433	0.000	0.235
<i>AGE</i>	814	15.307	6.183	1	38

Source: Authors' elaboration.

4.2. Variance inflation factor

The results in Table 2 indicate that all variables showed a variance inflation factor (VIF) less than 10, with the highest VIF value of 1.883 and the lowest tolerance value of 0.531 recorded in the gender diversity variable. Therefore, there is no problem of multicollinearity since all variables had VIFs less than 10 and a tolerance value less than 0.1 (Hair et al., 2014).

Table 2. Variance inflation factor

Variable	VIF	1/VIF
<i>GD</i>	1.883	0.531
<i>SIZE</i>	1.851	0.54
<i>MD</i>	1.784	0.561
<i>DT</i>	1.642	0.609
<i>BS</i>	1.385	0.722
<i>CD</i>	1.214	0.824
<i>BL</i>	1.154	0.867
<i>FE</i>	1.142	0.876
<i>LEVERAGE</i>	1.129	0.886
<i>AGE</i>	1.123	0.89
Mean VIF	1.431	

Source: Authors' elaboration.

4.3. Correlation matrix

Table 3 displays the results of the correlation matrix for board diversity, aggressive tax planning, and digital transformation.

Concerning the multicollinearity issue, it is observed that the highest correlation is at 0.825

between financial expertise and multiple directorship. All other correlation coefficients are within the range of -0.766 and 0.825, indicating that none of them is more than 0.9 (Hair et al., 2014). Consequently, there is no significant multicollinearity issue.

Table 3. Correlation matrix

Variable	ATP	DT	CEO1	CEO2	BS	MD	CD	GD	FE	SIZE	LEVE	AGE
ATP	1.000											
DT	-0.059	1.000										
CEO1	-0.383	0.598	1.000									
CEO2	-0.085	0.526	0.101	1.000								
BS	0.021	0.189	0.193	0.183	1.000							
MD	-0.078	0.731	0.098	0.714	0.162	1.000						
CD	-0.438	0.209	0.326	0.141	0.389	0.208	1.000					
GD	-0.063	0.291	0.124	0.652	0.490	0.618	0.098	1.000				
FE	-0.017	0.289	0.135	0.440	-0.437	0.825	-0.766	0.773	1.000			
SIZE	-0.213	0.118	-0.577	0.285	0.685	0.162	0.160	0.274	0.376	1.000		
LEVE	-0.084	0.308	-0.602	0.229	0.122	0.182	0.172	0.136	0.160	0.381	1.000	
AGE	0.014	0.194	0.314	0.048	0.636	-0.693	0.238	0.088	0.722	0.153	0.093	1.000

Source: Authors' elaboration.

4.4. Hypotheses test

To test the empirical relevance of the board of directors, diversity hypotheses, which are likely to exert a significant impact on bank aggressive tax planning, the study used ordinary least squares (OLS) as a basis for testing and also used generalized method of moments (GMM) estimation to deal with the endogeneity issue (Table 4). According to Khan et al. (2021), the GMM estimator is superior to other estimators (e.g., OLS, random effects, and fixed-effects) in dealing with unobservable heterogeneity and reverse causality substantially. In addition, prior research on board diversity has shown endogenous (Abiad et al., 2025). Therefore, the study adopted a GMM model to resolve any heteroscedasticity of residuals or endogeneity of the independent variables. However, although the GMM estimator is effective in resolving endogeneity problems, the possibility of under-specification of the instrument is present (Stock et al., 2002).

Therefore, we conducted a set of tests to examine the internal validity of the GMM instruments for the study. The Arellano and Bond (1991) test for first-order autocorrelation (AR1) and second-order autocorrelation (AR2) was calculated. Table 4 shows that the null hypothesis of no first-order autocorrelation (AR1) is rejected in all regressions. However, the second null hypothesis of no second-order autocorrelation (AR2) is not rejected. These results indicate that our first model is not subject to serial correlation and that the instruments are valid. Furthermore, the Hansen (1982) test was used to check for model over-specification. The test results indicate that the null hypothesis regarding the validity of the (external) instruments is not rejected in both models. Therefore, the model is considered valid and correctly specified, especially since these tests indicate that the tools are not related to the residuals (Alghemary et al., 2024; Roodman, 2009). The above arguments apply to the second model as well.

Table 4. Regression results on board diversity and aggressive tax planning

Variable	Labels	Model 1 H1-6	Model 1 H1-6
		OLS	GMM
Aggressive tax planning _{t-1}	ATV		0.1806** (0.0423)
CEO leadership	CEO1	-0.2468 (0.1820)	-0.3204 (0.1583)
	CEO2	-0.0842** (0.0155)	-0.0586*** (0.0003)
Board size	BS	0.0152 (0.1638)	0.0085 (0.2904)
Multiple directorships	MD	-0.0935** (0.0226)	-0.0791** (0.0271)
Competency diversity	CD	-0.2548 (0.1537)	-0.5105 (0.3275)
Gender diversity	GD	-0.0249*** (0.0000)	-0.0226*** (-3.0257)
Financial expertise	FE	-0.1042* (0.0620)	-0.0718* (0.0608)
Bank size	SIZE	-0.0798* (0.0638)	0.0385** (0.0377)
Bank leverage	LEVE	-0.3406 (0.1186)	0.3016 (0.1294)
Bank age	AGE	-0.0957* (0.0588)	-0.0603** (0.0395)
Time dummies	TIME	Yes	Yes
Country dummies	COUNTYY	Yes	Yes
Constant	CONS	0.5527 (0.4398)	0.7490 (0.5280)
Observations	N	814	814
Multicollinearity (Mean VIF)	VIF	1.43	
R-squared	R2	0.331	
F-statistic	FSS	11.6	
Hansen test (Chi-square, p-value)	HANSEN p		28.61 (0.2510)
H ₀ : Allerano-Bond test AR(1) (z, p-value)	AR(1) (p-V)		(0.0000)
H ₀ : Allerano-Bond test AR(2) (z, p-value)	AR(2) (p-V)		(0.381)

Note: *, **, and *** significant at 0.1, 0.05, and 0.01, respectively.

Table 4 shows that CEO-only employee, multiple directorships, gender diversity, and financial expertise had a negative impact on aggressive tax evasion. Meanwhile, CEO promoter, board size, and competency diversity had no significant impact. Furthermore, the GMM model

yielded results similar to the baseline model. Table 5 shows that technological transformation had a significant impact on the relationship between some board diversity indicators and aggressive tax evasion.

Table 5. Regression results on aggressive tax planning as a mediating

Variable	Labels	Model 2 H7	Model 2 H7
		OLS	GMM
Aggressive tax planning _{it}	ATP		0.1887*** (0.0000)
CEO leadership	CEO1	-0.1090* (0.0821)	-0.2304 (0.1593)
	CEO2	-0.0602** (0.0251)	-0.0806* (0.0693)
Board size	BS	0.0536 (0.2508)	0.0185 (0.3921)
Multiple directorships	MD	-0.0943** (0.0601)	-1.8151*** (-2.2903)
Competency diversity	CD	-0.2448 (0.1374)	-0.1625* (0.0811)
Gender diversity	GD	-0.0382*** (0.0000)	-0.0206*** (0.0000)
Financial expertise	FE	-0.0982** (0.0278)	-0.0738** (0.0288)
Digital transformation	DT	-0.0539** (0.0303)	-0.0281*** (0.0000)
CEO leadership*DT		-0.0728* (0.0641)	-0.0557** (0.0195)
Board size*DT		-0.0038*** (0.0000)	0.0052*** (0.0005)
Multiple directorships*DT		-0.1496* (0.0684)	-0.0783** (0.0214)
Competency diversity*DT		-0.0027*** (0.0000)	-0.0133*** (0.0039)
Gender diversity*DT		0.0102 (0.2637)	-0.3201 (0.1721)
Financial expertise*DT		-0.0084*** (0.0000)	-0.0075*** (0.0000)
Bank size	SIZE	-0.1394* (0.0756)	-0.1092* (0.0638)
Bank leverage	LEVE	-0.1138* (0.0622)	-0.0682** (0.0371)
Bank age	AGE	-0.0796** (0.0257)	-0.1183* (0.0661)
Time dummies	TIME	Yes	Yes
Country dummies	COUNTYY	Yes	Yes
constant	CONS	0.2930 (0.1493)	0.4092 (0.2103)
Observations	N	814	814
Multicollinearity (Mean VIF)	VIF	1.43	
R-squared	R2	0.526	
F-statistic	FSS	81.7	
Hansen test (Chi-square, p-value)	HANSEN p		21.96 (0.3348)
Allerano-Bond test AR(1) (z, p-value)	AR(1) (p-V)		(0.0000)
Allerano-Bond test AR(2) (z, p-value)	AR(2) (p-V)		(0.1846)

Note: *, **, and *** significant at 0.1, 0.05, and 0.01, respectively.

5. DISCUSSION

This study relies on agency theory as a key theoretical lens capable of explaining the relationship between predictors and aggressive tax planning. Agents may pursue arbitrary tax practices that are inconsistent with the aspirations of owners and creditors (Alkausar et al., 2023). Such practices cause the bank to lose the trust of stakeholders and the public. In addition, the positive theory suggests that agents and principals may share in adopting accounting practices that reduce and mitigate tax liabilities, especially since taxes have a direct impact on shareholders' profits (Tanko, 2025). Therefore, tax evasion practices are considered an important ethical issue that poses a challenge to stakeholders. Six hypotheses were developed to explain the relationship between board diversity and aggressive tax planning, as well as one hypothesis for the moderating effect of digital transformation.

The study concluded that some dimensions of board diversity are negatively and significantly associated with aggressive tax planning in banks listed in GCC countries, while others have not shown a significant impact. Specifically, the findings showed that CEO promoters negatively impact aggressive tax-making plans. This conclusion is consistent with the legitimacy theory, which refers to managers who have a favorable reputation and social capital and are often seeking to avoid

behaviors that could damage an enterprise's marketing reputation (Duan et al., 2018; Lanis et al., 2022). Nevertheless, over time, that effect may become only partial. The CEO's presence could potentially limit some competitive tax planning practices, but it might not completely eradicate them. The hypothesis that multiple directorships negatively correlate with aggressive tax planning also found support in the results. This argument is consistent with resource dependence theory, which maintains that managers with extensive networks and experience bring with them various experiences and knowledge that improve the control quality and reduce opportunistic tax behaviors (Ahmed, Ganesan, et al., 2023; Ahmed, Aldhaher, et al., 2021; Jiang et al., 2023). Gender diversity has shown a strong negative impact on aggressive tax planning, reinforcing previous evidence that the presence of women on the board increases transparency and compliance with laws and reduces aggressive tax planning risks. These outcomes are consistent with the studies by Jarboui et al. (2020) and Utaminingsih et al. (2022). The observed indicates an ethical consideration in tax planning decisions, where female members are inclined to prioritize a firm's reputation and steer clear of opportunistic behaviors that could adversely affect the firm's image (Al-Matari, 2022).

In the same context, the findings confirmed the negative association between financial expertise

and the aggressive tax plan between the Arab GCC Countries. Members with qualified financial experience possess the ability to comprehend and scrutinize the intricacies of financial reporting. Such an ability could enhance the limitation of aggressive tax practices (Mollah et al., 2021). Conversely, the results did not demonstrate statistical significance regarding board size, indicating that the increasing membership no longer affects enhanced control over aggressive tax intentions, as per Iazzi et al. (2023). Furthermore, Table 5 presents a significant finding regarding the moderating role of digital transformation in the relationship between board diversity and aggressive tax planning. Digital transformation also plays a moderating role in enhancing the influence of board diversity. Interactions among different dimensions of digital transformation and variables, including executive leadership, memberships, gender diversity, and financial expertise, indicate that digital transformation functions as a multiplicity mechanism for effective oversight. It decreases information gaps and increases openness, restricting management's potential to pursue aggressive tax tactics for executive capability. The hypothesis *H7* was strongly supported (Souguir et al., 2025; Xie & Huang, 2023). The result is consistent with agency theory, which suggests that technology can reduce opportunistic behaviors by improving transparency and internal control.

6. CONCLUSION

This study has important implications for regulators, governments, and other stakeholders. It helps regulators develop more responsive regulatory frameworks for the transformations of the digital economy. Furthermore, it provides policymakers with empirical evidence on the importance of board diversity as a tool to curb unethical tax practices. For governments, the findings may highlight concrete opportunities to enhance tax collection systems in more effective ways. Furthermore, the study encourages investors and stakeholders to

use the findings to assess potential future tax risks, particularly in light of the digital transformation. However, the results cannot be generalized to other sectors in the GCC, particularly since the sample was limited to commercial banks. Therefore, future researchers could expand the study to include other sectors, such as non-financial companies and Islamic banks. Researchers could also adopt qualitative approaches (such as interviews with executives and board members) alongside quantitative data to offer helpful conclusions about the impact of board diversity. Future researchers could also explore the potential interactions of the environmental, social, and governance paradigm, particularly since it is crucial in shaping banks' tax behavior.

The study examined the impact of board diversity on aggressive tax planning in GCC banks. It also examined the moderating effect of digital transformation on the aforementioned relationship. The study used a sample of 74 commercial banks spanning the period from 2010 to 2020. OLS estimations and the general matrix model were used to analyze the data. The results showed strong evidence that some dimensions of board diversity, such as multiple management positions, gender diversity, and financial experience, negatively impact aggressive tax evasion. Conversely, board size and talent diversity had no significant effects. Therefore, we can argue that not all forms of diversity can improve the effectiveness of boards in curbing aggressive tax evasion. The results also indicated that digital technologies enhance the effectiveness of diverse boards in reducing tax evasion. In other words, the integration of digital transformation with governance structures enhances information security, improves oversight mechanisms, and mitigates reputational and ethical risks associated with aggressive tax practices. In this regard, the study makes important contributions to the literature on board diversity and tax planning in the context of emerging economies. The study confirms that board diversity, along with digital transformation, plays a pivotal role in promoting responsible tax behavior among banks.

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