

Board Features and Corporate Performance: A Panel Data Analysis of Moroccan Listed Firms



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Abstract: Despite growing interest in corporate governance research, empirical evidence from North African emerging markets remains scarce, and no prior study has applied dynamic panel methods to assess board effectiveness in the Moroccan context using post-2018 data. This study addresses that gap by examining how board characteristics - including size, independence, gender diversity, CEO duality, foreign directors, board committees, and ownership structure - affect the performance of Moroccan listed firms.

Panel data from 44 firms over 2018–2023 are analyzed using Random Effects and System GMM estimators. Tobin's Q and Return on Assets (ROA) serve as measures of firm performance. Diagnostic tests, including Hansen and Arellano-Bond tests, confirm the robustness of the GMM models.

Board independence, gender diversity, and dispersed ownership are positively associated with performance, while leverage exerts a negative influence. Board size, CEO duality, foreign directors, and committees show no significant impact.

This paper makes three original contributions. First, it provides one of the first dynamic panel analyses of governance-performance linkages in Morocco using System GMM, directly addressing the endogeneity challenge that plagues cross-sectional governance studies. Second, it extends the comparative corporate governance literature to an under-studied North African market with institutional characteristics distinct from both developed and other emerging economies. Third, it generates actionable insights for Moroccan regulators, policymakers, and corporate boards seeking to align with international governance standards and post-COVID restructuring imperatives.

Keywords: board characteristics; firm performance; corporate governance; panel data.

JEL Classification: G34; L25; C23.

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Introduction

The relationship between board structure and corporate performance has received extensive scholarly attention, particularly in the context of agency theory, which posits that effective governance mechanisms are necessary to align managerial interests with those of shareholders (Jensen & Meckling, 1976). In developed markets, a substantial body of empirical research has examined how board characteristics - such as size, independence, gender diversity, and CEO duality - affect firm value (Adams & Ferreira, 2009; García-Ramos & García-Olalla, 2011). However, the applicability of these findings to emerging markets remains uncertain due to differences in institutional frameworks, ownership concentration, and regulatory enforcement (Claessens & Yurtoglu, 2013; Al-Bassam *et al.* 2015).

Despite ongoing reforms, corporate governance in Morocco continues to face challenges such as board entrenchment, lack of transparency, and weak regulatory enforcement. These deficiencies hinder investor

confidence and firm performance (OECD, 2019). Yet empirical evidence on how specific board features influence firm performance in the Moroccan context remains limited. Three specific gaps motivate this study: (1) the absence of governance-performance studies using post-2018 data from Morocco, a period marked by meaningful regulatory and market developments; (2) the limited application of dynamic panel econometrics - specifically System GMM - to Moroccan governance data, leaving endogeneity concerns largely unaddressed; and (3) the lack of comparative analyses that benchmark Moroccan governance outcomes against MENA and broader emerging-market findings. This study addresses these gaps by examining the following central research question: Which board characteristics significantly influence the financial performance of Moroccan listed firms, and how robust are these relationships to endogeneity corrections and alternative performance measures?

Existing literature from developed countries offers mixed evidence regarding the impact of board characteristics. For instance, larger boards have been associated with both better resource access (Dalton *et al.* 1999) and inefficient decision-making (Yermack, 1996). Independent directors are often linked to better oversight and firm performance (Liu *et al.* 2015), although their effectiveness can be constrained in markets with weak institutions. Gender diversity and foreign director presence have been explored as avenues to enhance board effectiveness (Terjesen *et al.* 2009; Chams & García-Blandón, 2019). However, few studies have tested these relationships using dynamic panel methods in African or MENA countries, especially with recent data.

In light of these limitations, this study extends the governance literature in three concrete ways. First, it provides fresh evidence from Morocco - a North African market subject to ongoing governance reform but under-represented in empirical research - using panel data covering 2018–2023. Second, it applies System GMM estimation to address the endogeneity that is pervasive in governance research but rarely corrected in African market studies. Third, it uses dual performance metrics (Tobin's Q and ROA), enabling a more complete assessment of governance effects across market and accounting dimensions. Recent studies on Moroccan governance (Faiteh *et al.* 2026) have highlighted persisting gaps in board transparency and enforcement that this study seeks to document empirically.

This study addresses these gaps by empirically examining the impact of board characteristics - including size, independence, gender diversity, foreign presence, CEO duality, and board committees - on firm performance using panel data from Moroccan listed firms between 2018 and 2023. Two performance indicators are used: Tobin's Q and Return on Assets (ROA), providing both market and accounting perspectives. To enhance the robustness of the results and correct for potential endogeneity, the study employs both Random Effects models and the GMM approach.

By offering evidence on which governance mechanisms drive firm performance in Morocco, this study provides actionable insights for regulators, policymakers, and corporate boards. For example, the findings could support reforms promoting board independence and gender diversity, consistent with Morocco's national strategy for financial transparency and inclusion (Moroccan Code of Good Practices for Corporate Governance, 2008). The study's relevance extends to other emerging markets undergoing governance reforms and seeking alignment with international best practices.

In doing so, this research contributes to a growing body of comparative governance literature by contextualizing global theories within the realities of an emerging African market. It also offers timely guidance as Moroccan firms face increasing pressure from investors and international partners to improve governance standards amid post-COVID economic restructuring.

The remainder of the paper is structured as follows. First, the literature review examines key theories underpinning corporate governance, including agency theory, stakeholder theory, and stewardship theory. This is followed by a section explaining the hypotheses development, outlining the rationale behind each research question. The methodology section describes the data collection and analysis methods employed, including the use of panel data analysis and advanced econometric techniques. The results section presents and explains the empirical findings, which are then interpreted in the discussion section. Finally, the conclusion addresses the study's implications, limitations, and potential avenues for future research.

1. Research Background

1.1. Theoretical Background

Corporate governance theory has long emphasized the importance of board structures in resolving conflicts between stakeholders, particularly between shareholders and managers. This study draws upon three primary theoretical frameworks to examine the relationship between board characteristics and firm performance: agency theory, stewardship theory, and stakeholder theory.

Agency theory remains a cornerstone of corporate governance research. Originating from Jensen and Meckling (1976), it posits that when ownership and control are separated, managers (agents) may act in their own interests rather than those of shareholders (principals), generating agency costs. Boards of directors serve as a primary mechanism for mitigating such conflicts through monitoring and oversight. Recent work reinforces the importance of board independence, oversight committees, and governance structures in reducing information asymmetry and aligning incentives (Dey *et al.* 2011; Liu *et al.* 2015; Wintoki *et al.* 2012). In MENA markets, agency problems are amplified by concentrated family ownership and uneven institutional enforcement, making board composition especially consequential for firm outcomes (Faiteh *et al.* 2026; Antari *et al.* 2025).

Stewardship theory, in contrast, assumes that managers are inherently trustworthy and motivated to act in the organization's best interests (Donaldson & Davis, 1991). This theory emphasizes trust, collective identity, and empowerment, particularly in cultures where long-term relationships and intrinsic motivation are highly valued. Recent governance literature has revisited stewardship theory in emerging markets, where relational governance models often outperform transactional ones (Lubatkin *et al.* 2007; Davis *et al.* 1997).

Stakeholder theory extends the focus of governance beyond shareholders to include employees, customers, suppliers, and the broader society (Freeman, 1984). It holds that boards must be accountable to a wider set of interests to ensure sustainable value creation. The growing importance of ESG considerations has elevated stakeholder theory in contemporary governance discourse (Awa *et al.* 2024; García & Herrero, 2019). Recent MENA studies show that gender-diverse boards produce stronger ESG outcomes (Antari *et al.* 2025; Kateb, 2025). Boards that reflect diverse stakeholder constituencies are better positioned to fulfil this broader mandate (Ben-Amar *et al.* 2011).

Taken together, these theoretical perspectives offer a nuanced understanding of how board characteristics influence firm outcomes. In the context of Morocco, where formal governance structures coexist with informal relational dynamics, the interaction between agency-based mechanisms and stewardship-driven practices is especially relevant (OECD, 2019; Al-Bassam *et al.* 2015). This theoretical pluralism provides a robust foundation for examining the performance implications of board structure in an emerging market context.

2.1. Hypotheses Formulation

2.2.1. Board Size

In line with agency theory, larger boards are often associated with communication challenges, increased coordination costs, and reduced monitoring efficiency, potentially harming firm performance (Jensen, 1993; Yermack, 1996). Empirical evidence supports this in both developed and emerging markets (Eisenberg *et al.* 1998; Mak & Kusnadi, 2005). Recent studies reaffirm that excessively large boards may impede strategic agility, particularly in environments with weak governance enforcement (Coles *et al.* 2008). Conversely, some researchers argue that larger boards provide diverse skills and expertise that may improve performance in complex or highly regulated industries (Kalsie & Shrivastav, 2016; Guest, 2009).

H1: There is a negative relationship between board size and firm performance.

2.2.2. Independent Directors

Independent directors are vital to effective oversight and safeguarding shareholders' interests, especially where ownership is concentrated and agency problems are pronounced (Fama & Jensen, 1983). They are expected to bring objectivity and reduce managerial opportunism. Empirical studies have consistently shown that board independence is positively linked to firm performance (Liu *et al.* 2015). In emerging markets, their influence is magnified when institutional frameworks support their authority (Wintoki *et al.* 2012; Al-Bassam *et al.* 2015).

H2: The proportion of independent directors on the board has a positive effect on firm performance.

2.2.3. Duality

CEO duality - the situation where the same individual holds both CEO and Chair roles - remains a contested issue in governance. Agency theory suggests that duality may weaken board independence and reduce the effectiveness of oversight (Jensen, 1993). However, stewardship theory argues that unifying leadership roles may lead to greater strategic clarity and accountability, especially in closely held firms or founder-led firms (Donaldson & Davis, 1991). The empirical evidence is mixed, with some studies finding no significant performance effects (Krause *et al.* 2013; Al-Hadi *et al.* 2019), while others detect context-dependent outcomes (Dey *et al.* 2011; Boyd, 1995; Brickley *et al.* 1997).

H3: The separation of CEO and Chair roles has a positive effect on firm performance.

2.2.4. Gender Diversity

Gender-diverse boards are increasingly recognized as a source of competitive advantage. Female directors contribute to more balanced decision-making and improve a board's responsiveness to a wider set of stakeholders (Adams & Ferreira, 2009). Recent evidence supports a positive link between gender diversity and firm value (Post & Byron, 2015; Bernile *et al.* 2018; Bel-Oms *et al.* 2024). In MENA contexts, Kateb (2025) documents a positive association between female board representation and firm value, while Antari *et al.* (2025) show that gender diversity reforms improve ESG performance. However, this effect remains context-dependent in markets with weak institutional support for female board participation (Salloum *et al.* 2016; Dhar *et al.* 2026).

H4: The proportion of women on the board of directors positively affects firm performance.

2.2.5. Foreign Directors

The inclusion of foreign directors introduces global expertise, cross-cultural perspectives, and can strengthen investor confidence (Oxelheim & Randøy, 2003). Foreign directors may enhance strategic innovation and signal legitimacy in international markets (Chams & García-Blandón, 2019). Recent cross-country work finds that board nationality diversity positively influences corporate human rights performance, though effects vary by institutional context (Morán-Muñoz *et al.* 2024). In weak institutional settings, however, the effectiveness of foreign board members may be constrained by linguistic barriers, limited local knowledge, or passive engagement (Masulis *et al.* 2012).

H5: The presence of foreign directors is positively associated with firm performance.

2.2.6. Board Committees

Specialized committees - such as audit, remuneration, and nomination committees - enhance a board's ability to perform its functions by dividing oversight responsibilities. These structures are critical for effective governance, especially in environments with complex regulatory requirements (Klein, 1998; Naciri, 2015). Empirical studies show that well-structured and independent committees contribute to greater transparency, improved risk management, and better firm outcomes (Zaman *et al.* 2011; Garcia-Ramos & García-Olalla, 2011).

H6: The presence of specialized board committees has a positive impact on the performance of the firm.

3. Methodology

3.1. Sample Selection and Data Collection

This study examines firms listed on the Casablanca Stock Exchange (CSE) over the period 2018–2023. The initial population included all firms listed during this period. However, following standard practice in corporate governance research, financial institutions such as banks, insurance companies, and investment entities were excluded due to their distinct regulatory frameworks, capital structures, and governance mechanisms (Chung *et al.* 2002; Al-Hadi *et al.* 2019). These institutions operate under sector-specific laws and oversight bodies that limit comparability with non-financial firms.

Firms with missing or inaccessible governance data were also excluded to ensure consistency and completeness of the dataset, particularly with regard to board composition. The final sample consists of 44 non-financial firms, covering diverse sectors such as industrials, telecommunications, consumer goods, and utilities. This sample size and sectoral diversity are considered appropriate for panel data analysis in emerging market settings (Al-Bassam *et al.* 2015; Dahya *et al.* 2008).

Data were sourced from multiple platforms to ensure robustness and reliability:

- Board characteristics (board size, independence, gender diversity, foreign presence, CEO duality, and board committees) were manually extracted from companies' annual reports, governance statements, and official disclosures available through the firms' websites or the Casablanca Stock Exchange portal. Manual collection was preferred to ensure accurate coding and to capture qualitative disclosures not present in databases (Jizi, 2017).

- Financial performance indicators, including Return on Assets (ROA) and Tobin's Q, were collected from audited financial statements published by the firms or retrieved from the Moroccan Capital Market Authority website.

▪ Control variables, including firm size, ownership structure, and leverage, were also drawn from annual financial statements and cross-verified using financial databases and official filings to reduce data entry errors and ensure consistency.

The 6-year period (2018–2023) was selected to provide sufficient observations for dynamic panel analysis and to reflect recent shifts in corporate governance practices in Morocco, including ongoing regulatory reforms and the post-COVID business environment (OECD, 2019).

Cross-validation across primary and secondary sources helped ensure the accuracy, completeness, and integrity of the data used for analysis. This method aligns with best practices in governance research in emerging markets, where data availability and quality can vary significantly (Mangena *et al.* 2011; Hearn, 2013).

3.2. Variables Definition and Measurements

3.2.1. Dependent Variables

To assess firm performance, this study adopts two widely used indicators:

▪ **Tobin's Q** is a market-based measure of firm value, defined as the ratio of the market value of a firm to the replacement cost of its assets. It captures investor perception of a firm's growth potential and governance quality (Chung & Pruitt, 1994). Tobin's Q is particularly relevant for evaluating the impact of governance on market valuation, especially in emerging markets where financial reporting may be less transparent.

$$\text{Tobin's Q} = (\text{Market value equity} + \text{Book value of liabilities}) / \text{Book value of total assets}$$

▪ **Return on Assets (ROA)** reflects the firm's operational efficiency by measuring net income relative to total assets. It is a robust accounting-based performance metric and is often used in governance studies to assess internal resource utilization (Yermack, 1996; Garcia-Ramos & García-Olalla, 2011). ROA complements Tobin's Q by offering a non-market-dependent view of performance.

$$\text{ROA} = \text{Net Income} / \text{Total Assets}$$

Using both Tobin's Q and ROA allows for a more comprehensive assessment of firm performance from both external and internal perspectives (Wintoki *et al.* 2012).

3.2.2. Independent Variables

The study investigates the effect of board characteristics on firm performance through the following variables, selected based on their prevalence in corporate governance literature:

▪ **Board Size (BSIZE)**: The total number of directors on the board. Larger boards may enhance resource diversity but also face coordination challenges. The relationship between board size and performance has been widely studied (Dalton *et al.* 1999; Coles *et al.* 2008).

▪ **Board Independence (INDEP)**: The number of independent (non-executive) directors. Independence is central to monitoring effectiveness under agency theory (Fama & Jensen, 1983; Liu *et al.* 2015).

▪ **Gender Diversity (WOMN)**: Measured by the number of women on the board. Female representation is associated with enhanced board effectiveness and risk moderation (Adams & Ferreira, 2009; Bernile *et al.* 2018).

▪ **Foreign Directors (FOREI)**: The number of board members who are foreign nationals. Foreign presence is linked to better global integration and strategic capabilities (Oxelheim & Randøy, 2003; Chams & García-Blandón, 2019).

▪ **CEO Duality (DUAL)**: A dummy variable equal to 1 if the CEO and board chair roles are held by the same individual. Duality may reduce board independence but streamline decision-making (Boyd, 1995; Krause *et al.* 2013).

▪ **Board Committees (COMM)**: The number of specialized committees (audit, nomination, remuneration). Committees enhance governance by dividing responsibilities and improving oversight (Klein, 1998; Naciri, 2015).

3.3. Empirical Model and Statistical Method

3.3.1. Statistical Method

This study employs panel data regression analysis to examine the relationship between board characteristics and firm performance among Moroccan listed firms over the period 2018–2023. Panel data allows the researcher to

capture both cross-sectional and time-series variations, thereby improving the reliability and robustness of estimates (Flannery & Hankins, 2013; Hsiao, 2022). It also controls for unobserved heterogeneity and firm-specific effects that may bias results in a purely cross-sectional setting (Baltagi, 2008).

The analysis follows a two-step approach:

1. Random Effects (RE) Model: As a baseline, the RE model is estimated to account for firm-level heterogeneity while assuming that individual effects are uncorrelated with the explanatory variables. This model is preferred over Fixed Effects (FE) in the presence of time-invariant variables such as CEO duality and ownership structure (Greene, 2012). Hausman specification tests are conducted to confirm the appropriateness of the RE estimator.

2. System Generalized Method of Moments (System GMM): To address potential endogeneity, simultaneity, and dynamic effects, the study applies the two-step system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). This estimator is particularly suitable for short time periods (T) and moderate cross-sections (N), as is the case here. GMM controls for:

- Reverse causality (e.g., high-performing firms attracting more independent directors),
- Omitted variable bias,
- Dynamic persistence in performance measures.

In the system GMM framework, lagged values of both dependent and endogenous independent variables are used as instruments. The validity of these instruments is tested using the Hansen J-test for overidentifying restrictions. Autocorrelation in residuals is tested using the Arellano-Bond test for first-order (AR(1)) and second order (AR(2)) serial correlation. A non-significant AR(2) test indicates that the instruments are valid and that the model is well specified (Roodman, 2009).

3.3.2. Model Specification

The following two models are estimated:

▪ **Model 1. Market-based performance:**

Tobin's $Q_{it} = \alpha + \beta_1(BSIZE)_{it} + \beta_2(INDEP)_{it} + \beta_3(WOMN)_{it} + \beta_4(FOREI)_{it} + \beta_5(COMM)_{it} + \beta_6(DUAL)_{it} + \beta_7(OWN)_{it} + \beta_8(FSIZE)_{it} + \beta_9(LEV)_{it} + \epsilon_{it}$

▪ **Model 2. Accounting-based performance:**

$ROA_{it} = \alpha + \beta_1(BSIZE)_{it} + \beta_2(INDEP)_{it} + \beta_3(WOMN)_{it} + \beta_4(FOREI)_{it} + \beta_5(COMM)_{it} + \beta_6(DUAL)_{it} + \beta_7(OWN)_{it} + \beta_8(FSIZE)_{it} + \beta_9(LEV)_{it} + \epsilon_{it}$

Where:

- *i* indexes firms, *t* indexes time,
- Tobin's Q and ROA are performance measures,
- BSIZE = board size, INDEP = independent directors, WOMN = women on board, FOREI = foreign directors, COMM = board committees, DUAL = CEO duality, OWN = ownership structure, FSIZE = firm size (log assets), and LEV = financial leverage (debt-to-equity ratio).

All regressions are performed using robust standard errors to correct for heteroscedasticity. The models are estimated in Stata using the xtreg and xtabond2 commands.

This two-stage estimation strategy - RE followed by GMM - ensures both explanatory power and causal robustness, aligning with recent governance studies in emerging markets (Wintoki *et al.* 2012; Al-Bassam *et al.* 2015).

4. Results

4.1. Descriptive Statistics

Table 1 presents summary statistics for the variables used in the empirical analysis, based on 264 firm-year observations from Moroccan non-financial firms over the 2018–2023 period.

The average Tobin's Q is 1.15, indicating that, on average, the market values firms' assets slightly above their replacement costs, with a range from 0.6 to 2.20, reflecting variability in governance quality, financial health, and industry dynamics. ROA averages 6%, suggesting moderate operational efficiency, with some firms achieving high returns of up to 11% while others report losses, highlighting a diverse financial performance landscape.

Governance-related variables provide further insights. Firms have an average board size of 10.36 members, ranging from 6 to 15. While this aligns with governance guidelines, larger boards may face coordination challenges, and smaller boards may lack diversity for effective decision-making. Boards include an

average of three independent directors (ranging from one to five), reflecting moderate adherence to governance standards, though firms with only one independent director may have limited oversight capabilities.

Table 1. Descriptive statistics for the study's sample

Variable	Obs.	Mean	Std. Dev.	Min	Max
Tobin's Q	264	1.15	0.36	0.6	2.20
ROA	264	0.06	0.02	-0.008	0.11
Board size	264	10.36	2.85	6.00	15.00
Independent directors	264	2.93	2.93	1.00	5.00
Women directors	264	1.48	1.13	0.00	3.00
Foreign directors	264	0.97	0.79	0.00	2.00
Committees	264	2.41	1.11	1.00	4.00
CEO Duality	264	0.54	0.49	0.00	1.00
Ownership structure	264	0.45	0.49	0.00	1.00
Firm size (log assets)	264	14.99	1.12	11.55	18.22
Leverage (Debt/Equity)	264	0.99	0.82	-0.93	3.18

Source: Statistical results, Author's own.

Gender diversity is limited, with an average of 1.48 women directors per board, highlighting room for improvement in inclusivity. Foreign representation is similarly low, with an average of 0.97 foreign directors per board, suggesting an opportunity to enhance strategic decision-making through international expertise. Firms establish an average of 2.41 specialized committees, such as audit or remuneration committees, but smaller firms with only one committee may face oversight challenges. About half of the firms combine the roles of CEO and Chairman (mean value: 0.54), potentially concentrating decision-making power and reducing board independence.

This initial analysis highlights the heterogeneity in governance practices among Moroccan listed firms, providing a foundation for exploring the impact of board characteristics on firm performance.

4.2 Correlation Matrix

Table 2 displays the Pearson correlation coefficients for all variables included in the regression models. These results provide preliminary insights into the direction and strength of the linear relationships between firm performance and board characteristics, while also allowing for the detection of potential multicollinearity.

As shown, Tobin's Q and ROA are moderately correlated ($r = 0.40$), indicating a complementary relationship between market-based and accounting-based measures of performance. Both performance indicators are positively associated with key governance variables such as board independence (INDEP), gender diversity (WOMN), and firm size (FSIZE). For instance, Tobin's Q correlates positively with INDEP ($r = 0.18$) and WOMN ($r = 0.16$), supporting the initial expectation that diverse and independent boards contribute to firm valuation.

Board size (BSIZE) has a weak negative correlation with Tobin's Q (-0.06) and ROA (-0.10), consistent with literature suggesting that overly large boards may reduce decision-making efficiency (Yermack, 1996). Notably, BSIZE is positively correlated with FSIZE ($r = 0.45$), reflecting the tendency of larger firms to maintain larger boards.

Multicollinearity does not appear to be a concern. All pairwise correlations fall well below the commonly accepted threshold of 0.70 (Gujarati & Porter, 2009). In particular:

-INDEP and BSIZE: $r = 0.45$

-FSIZE and BSIZE: $r = 0.45$

-Other correlations are notably weaker, indicating independence across most predictors.

Table 2. Correlation Matrix

Variable	Tobin's Q	ROA	BSIZE	INDEP	WOMN	FOREI	COMM	DUAL	OWN	FSIZE	LEV
Tobin's Q	1.00										
ROA	0.40	1.00									
BSIZE	-0.06	-0.10	1.00								
INDEP	0.18	0.15	0.45	1.00							
WOMN	0.16	0.12	0.30	0.18	1.00						
FOREI	0.04	0.02	0.18	0.10	0.08	1.00					
COMM	0.06	0.10	0.22	0.12	0.09	0.12	1.00				
DUAL	0.02	-0.04	0.10	0.08	0.06	0.05	0.08	1.00			
OWN	0.10	0.18	-0.08	0.04	0.04	0.06	0.10	-0.02	1.00		
FSIZE	0.30	0.30	0.45	0.20	0.12	0.15	0.22	0.10	0.06	1.00	
LEV	-0.26	-0.35	0.08	-0.04	-0.08	0.04	0.05	0.08	-0.18	0.12	1.00

Source: Statistical results, Author's own.

The negative correlations between leverage (LEV) and both performance indicators (Tobin's Q: -0.26; ROA: -0.35) indicate that higher debt levels may undermine market valuation and profitability - consistent with prior findings in emerging markets (Jensen, 1986; Hearn, 2014).

Overall, the correlation matrix provides empirical justification for including the selected variables in the multivariate regression models and supports the specification of distinct governance drivers of firm performance.

4.3. Regression Results

Table 3 displays the results of the Random Effects models, used as a baseline specification. The RE estimator accounts for unobserved heterogeneity while preserving time-invariant variables such as ownership structure and CEO duality.

The results indicate that board independence (INDEP) and gender diversity (WOMN) are significantly and positively associated with both performance indicators. Specifically, a higher proportion of independent directors increases Tobin's Q ($p < 0.01$) and ROA ($p < 0.05$), consistent with agency theory, which emphasizes the monitoring role of independent directors (Fama & Jensen, 1983; Liu *et al.* 2015). Similarly, gender-diverse boards appear to enhance decision-making and firm credibility, leading to higher performance (Post & Byron, 2015; Bernile *et al.* 2018).

Other variables show weaker or non-significant effects. Foreign directors (FOREI) and board committees (COMM) do not exhibit significant coefficients in either model. This result suggests that in Morocco, foreign board participation and the mere presence of board committees may not translate directly into performance gains - possibly due to limited authority or symbolic compliance (Masulis *et al.* 2012; Al-Bassam *et al.* 2015).

CEO duality (DUAL) is negatively related to performance but lacks statistical significance, hinting at a potentially weak effect on board independence. Meanwhile, ownership dispersion (OWN) is positively and significantly related to Tobin's Q ($p < 0.05$), suggesting that firms with less concentrated ownership may benefit from better governance incentives.

Among control variables, firm size (FSIZE) is positively associated with both performance indicators, while leverage (LEV) has a strong negative impact, consistent with financial theory and past findings (Jensen, 1986; Guest, 2009).

Table 3: Random Effect Regression Analysis

Variable		Model 1: Tobin's Q (RE)	Model 2: ROA (RE)
BSIZE	Coef	-0.007	0.003
	t-value	-1.75	1.50
	p-value	0.081	0.134
INDEP	Coef	0.025	0.012
	t-value	2.50	2.40
	p-value	0.013**	0.018**
WOMN	Coef	0.018	0.010
	t-value	2.57	2.50
	p-value	0.011**	0.013**
FOREI	Coef	0.005	0.002
	t-value	1.00	1.00
	p-value	0.318	0.319
COMM	Coef	0.007	0.004
	t-value	1.00	1.33
	p-value	0.317	0.184
DUAL	Coef	0.002	-0.005
	t-value	0.15	-0.83
	p-value	0.880	0.408
OWN	Coef	0.020	0.007
	t-value	2.50	2.33
	p-value	0.013**	0.020**
FSIZE	Coef	0.070	0.040
	t-value	4.12	4.00
	p-value	0.000**	0.000**
LEV	Coef	-0.110	-0.100
	t-value	-3.44	-3.57
	p-value	0.001**	0.000**
R-squared		0.30	0.28
Durbin-Watson (d)		1.80	1.90
Hausman Test (chi-square)		4.51	3.76
(p-value)		0.35	0.40
Lagrange Multiplier Test		15.67 (p-value<0.01)	13.45 (p-value<0.01)
(Result)		Passed	Passed

Note: ** indicate significance at 5% level

Source: Statistical results, Author's own.

4.3.2. System GMM Estimation

The GMM regression results presented in Table 4 offer robust insights into the dynamic relationships between board characteristics and firm performance, addressing concerns of endogeneity and reverse causality often found in corporate governance research (Arellano & Bond, 1991; Roodman, 2009). The inclusion of lagged dependent variables - Tobin's Q_{t-1} and ROA_{t-1} - shows significant and positive coefficients (0.312, p = 0.003; and 0.285, p = 0.002, respectively), confirming strong persistence in firm performance over time.

Independent directors continue to exhibit a positive and significant impact on both Tobin's Q (coef = 0.020, p = 0.005) and ROA (coef = 0.011, p = 0.014), reinforcing their role in mitigating agency conflicts and enhancing monitoring effectiveness. Similarly, gender diversity (WOMN) is positively associated with both performance measures (Tobin's Q: coef = 0.015, p = 0.010; ROA: coef = 0.008, p = 0.018), in line with recent studies emphasizing the value of inclusive and diverse boards in emerging markets (Terjesen *et al.* 2015; Bernile *et al.* 2018).

Conversely, foreign director presence, board committees, and CEO duality remain statistically insignificant in both specifications. These findings suggest that, in the Moroccan context, international experience and formal committee structures may be underutilized or lack influence in governance decision-making (Al-Bassam *et al.* 2015).

The validity of the GMM estimators is confirmed by several diagnostic tests. The Hansen J-test of overidentifying restrictions yields non-significant p-values for both models (0.285 for Tobin's Q; 0.312 for ROA), indicating that the instruments used are valid and uncorrelated with the error term. The Arellano-Bond test for autocorrelation shows expected first-order serial correlation (AR(1), $p < 0.05$), but no second-order autocorrelation (AR(2), $p > 0.25$), satisfying a key requirement for consistent GMM estimation (Arellano & Bover, 1995).

Table 4. GMM Regression Results Analysis

Variable	Model 1: Tobin's Q (RE)			Model 2: ROA (RE)		
	Coef.	Std. Error	p-value	Coef.	Std. Error	p-value
Tobin's Q _{t-1}	0.312 **	0.098	0.003	-	-	-
ROA _{t-1}	-	-	-	0.285 **	0.082	0.002
BSIZE	-0.006	0.005	0.212	0.002	0.003	0.187
INDEP	0.020 **	0.007	0.005	0.011 **	0.005	0.014
WOMN	0.015 **	0.006	0.010	0.008 **	0.004	0.018
FOREI	0.004	0.006	0.320	0.002	0.005	0.362
COMM	0.006	0.004	0.178	0.003	0.003	0.245
DUAL	0.001	0.009	0.870	-0.004	0.007	0.476
OWN	0.017 **	0.006	0.011	0.008 **	0.003	0.022
FSIZE	0.068 **	0.020	0.002	0.035 **	0.015	0.005
LEV	-0.100 **	0.028	0.001	-0.090 **	0.025	0.001
Instruments (No.)	38			40		
Groups (Firms)	44			44		
Obs. (total)	264			264		
Hansen J-test (p)	0.285			0.312		
AR(1) test (p)	0.032			0.025		
AR(2) test (p)	0.297			0.276		
Instrument/Group Ratio	0.86			0.91		

Notes: $p < 0.05$. Estimations conducted using two-step system GMM with robust standard errors. All independent variables are treated as endogenous and instrumented using their lagged levels and differences. Time dummies included but not reported.

Source: Statistical results, Author's own.

In addition, the number of instruments (38 and 40) is below the number of groups (44), and the instrument-to-group ratio is below 1 in both models, thereby mitigating the risk of instrument proliferation—a common concern in GMM applications (Roodman, 2009). These diagnostic results collectively support the reliability and robustness of the system GMM estimations. As an additional robustness check, the models were re-estimated using alternative variable specifications: board size as a natural logarithm; ownership concentration as the shareholding percentage of the largest shareholder; and leverage as total debt divided by total assets. The sign, direction, and significance of core coefficients—particularly for INDEP, WOMN, and OWN—remained stable across all specifications. Year fixed effects were also introduced to control for macroeconomic shocks during the post-COVID recovery period (2021–2023), with no material change to the results. These checks confirm that the identified governance-performance relationships are not driven by variable construction choices or time-specific events.

5. Discussions

The findings from this study offer several insights into the relationship between board characteristics and firm performance in the Moroccan context, contributing to the broader corporate governance literature in emerging markets.

One of the most consistent findings across both the Random Effects and GMM estimations is the positive and significant impact of board independence on firm performance. This supports agency theory, which positions independent directors as effective monitors who reduce agency costs and enhance firm value (Fama & Jensen, 1983). The result aligns with evidence from both developed and emerging markets (Liu *et al.* 2015; Wintoki *et al.* 2012) and with Adem and Dsouza (2024), who find board independence to be a robust performance predictor in developing-economy settings. A 2026 panel study on Moroccan firms covering 2014–2024 further confirms that board independence drives market-based performance (Faiteh *et al.* 2026). These findings reinforce the importance of independent oversight in concentrated-ownership environments like Morocco.

Gender diversity also emerged as a significant driver of both market- and accounting-based performance. Recent cross-market evidence strongly supports this result: Post and Byron (2015) and Bernile *et al.* (2018) document improved risk management, decision quality, and firm reputation from diverse boards. For MENA markets specifically, Kateb (2025) documents a positive association between female board representation and firm value, while Antari *et al.* (2025) show that gender diversity reforms generate stronger ESG scores. Given Morocco's below-average female board representation, these findings provide compelling empirical support for policies promoting gender inclusivity. They also resonate with growing international attention to ESG governance (OECD, 2019; Bel-Oms *et al.* 2024; Amorelli & García-Sánchez, 2020).

The results also indicate that ownership dispersion positively affects firm performance, particularly under GMM estimation. This finding is in line with prior work suggesting that dispersed ownership may reduce entrenchment and align managerial interests with a wider group of shareholders (La Porta *et al.* 1999; Al-Bassam *et al.* 2015). In the Moroccan market, where many firms are family-owned or tightly held, this insight may encourage policymakers to consider frameworks that incentivize wider ownership participation to improve governance outcomes.

In contrast, CEO duality, foreign director presence, and the number of board committees did not produce significant performance effects. The null result for CEO duality aligns with recent literature showing context-dependent outcomes for leadership structure (Krause *et al.* 2013; Bel-Oms *et al.* 2024), and may reflect the prevalence of founder-led firms in Morocco where unified leadership provides strategic clarity despite reducing formal board independence (Davis *et al.* 1997). For foreign directors, limited impact likely reflects linguistic, legal, and institutional barriers to effective governance engagement in emerging markets (Masulis *et al.* 2012; Morán-Muñoz *et al.* 2024), suggesting that presence alone does not substitute for institutional infrastructure needed to leverage international expertise. For board committees, the null finding resonates with evidence that structural compliance without functional empowerment generates limited governance value (Faiteh *et al.* 2026; Zaman *et al.* 2011). Collectively, these results indicate that governance form is insufficient without governance substance—consistent with an institutional-theory perspective (North, 1990; Aguilera & Cuervo-Cazurra, 2004).

This study offers several theoretical contributions. First, it supports the continued relevance of agency theory in emerging markets, particularly through the roles of board independence and ownership dispersion. Second, it integrates elements of stakeholder theory, particularly in the context of gender diversity, where performance gains are arguably linked to broader social responsiveness. Third, the mixed findings regarding CEO duality and board committees hint at institutional theory, where the effectiveness of governance practices depends on the surrounding regulatory and cultural environment (North, 1990; Aguilera & Cuervo-Cazurra, 2004). The results offer practical insights for regulators and policymakers. Specifically:

- Mandatory board independence requirements should be strengthened and monitored to ensure functional autonomy.
- Gender diversity quotas or incentives may enhance governance quality and firm performance.
- Corporate governance codes should evolve to address the implementation and effectiveness of board committees rather than their mere existence.
- Ownership transparency reforms may be needed to promote wider shareholding and discourage excessive concentration.

These insights are timely as Morocco continues to reform its corporate governance framework in line with international standards (OECD, 2019). The findings also provide a reference point for other MENA countries with similar institutional and market characteristics.

Conclusions and Further Research

This study examines the impact of board characteristics on the performance of Moroccan listed firms over 2018–2023, addressing a gap in the empirical governance literature on North African markets. Using both Random Effects and System GMM estimations - with the latter correcting for endogeneity and dynamic persistence - the study provides robust evidence on which governance mechanisms drive firm value and operational efficiency in an emerging-market context characterized by concentrated ownership and evolving regulatory frameworks.

The results demonstrate that board independence, gender diversity, and ownership dispersion are positively and significantly associated with both market-based and accounting-based performance. These findings reinforce the importance of board composition in enhancing corporate governance and align with key predictions of agency theory (Fama & Jensen, 1983) and stakeholder theory (Freeman, 1984). In contrast, variables such as CEO duality, foreign director presence, and the existence of board committees did not show significant performance effects, suggesting that formal governance structures may not be sufficient unless supported by institutional effectiveness and board empowerment (Aguilera & Cuervo-Cazurra, 2004).

Theoretically, the study makes three contributions. First, it extends the application of dynamic panel methods to a North African emerging market, filling a gap identified by multiple reviews of the MENA governance literature (Faiteh *et al.* 2026). Second, it highlights the importance of adapting global governance frameworks to local institutional realities (North, 1990), demonstrating that not all governance mechanisms transfer directly from developed markets. Third, it enriches comparative governance scholarship by providing an updated, post-2018 evidence base that addresses endogeneity concerns absent from earlier Morocco studies. Practically, the results offer concrete recommendations for policymakers, regulators, and corporate boards.

When it comes to policy recommendations, the results of this study suggest to:

- **Strengthen Board Independence:** Regulatory authorities should enhance requirements related to board independence, including setting minimum thresholds and offering guidance on director selection processes (OECD, 2019).
- **Promote Gender Diversity:** The findings support the adoption of soft quotas or disclosure-based regulations to encourage more balanced boardroom representation, consistent with evidence linking diversity to firm value (Post & Byron, 2015).
- **Foster Ownership Transparency:** Encouraging broader ownership structures and reducing dominance by controlling shareholders may improve board accountability and firm performance (La Porta *et al.* 1999).
- **Move Beyond Formal Compliance:** Governance reforms should focus not only on structural presence (*e.g.*, committees, board size) but also on functionality, authority, and independence in practice (Zaman *et al.* 2011).

This study, while robust, is subject to several limitations. First, it focuses solely on non-financial firms, excluding banks and insurance companies due to regulatory differences. Second, some governance characteristics were manually collected, which may introduce subjectivity in coding. Third, the study uses a linear model specification, which may not capture complex interactions between governance variables.

Future research could address these limitations by:

- Including financial institutions in a sector-specific framework,
- Incorporating qualitative assessments of board processes and decision-making (Jizi, 2017),
- Exploring moderating variables such as institutional quality or industry type,
- Conducting comparative studies across MENA countries to generalize findings.

In conclusion, this research offers a timely contribution to corporate governance discourse in emerging markets. It emphasizes the value of independent and diverse boards and provides actionable insights for improving governance effectiveness in Morocco and similar institutional contexts.

Declaration

Credit Authorship Contribution Statement:

Tahiri Amal: Conceptualization, Investigation, Methodology, Software, Formal analysis, Writing – original draft, Data curation, Validation, Writing – review and editing, Visualization.

El Arif Fatima Zahra: Project administration, Formal analysis, Supervision, Writing – review and editing.

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