

Sector-Specific Analysis of Corporate Governance in Ghana: Implications of Board Size, and Female Board Chair Leadership for Board Independence and Gender Diversity

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Abstract

This study provides a sector-sensitive examination of corporate governance in Ghana, focusing on how board size and female board chair leadership shape board independence and gender diversity among firms listed on the Ghana Stock Exchange. Using a firm-level panel dataset spanning 2011–2022, the analysis employs a Panel Seemingly Unrelated Regression (PSUR) framework to model the interdependent nature of governance outcomes and to isolate structural differences between financial and non-financial institutions. The results reveal that internal board architecture is a decisive determinant of governance quality. Across sectors, larger boards significantly enhance both board independence and gender diversity, reflecting their role in expanding the pool of monitoring and representational expertise. Female board chair leadership emerges as the most influential governance catalyst, strengthening board inclusiveness and autonomy, particularly within non-financial firms where regulatory oversight is less stringent. In contrast, ownership concentration, especially government and foreign ownership, tends to constrain gender diversity while promoting formal board independence, highlighting a persistent governance trade-off between control and inclusion. The study advances governance theory by demonstrating that leadership diversity and board configuration, rather than ownership structure alone, are the primary drivers of inclusive and effective boards in emerging markets. Practically, the findings suggest that firms can strategically strengthen governance by increasing board size and elevating women into board chair roles, while regulators should complement independence mandates with explicit diversity requirements to achieve balanced governance reform. Overall, the paper offers a rigorous and actionable framework for promoting both independent and gender-diverse boards within developing corporate environments.

Keywords: Corporate Governance, Board Gender Diversity, Board Independence, Board Size, Female Board Chair Leadership

INTRODUCTION

In the evolving landscape of corporate governance, the composition and structure of boards have emerged as critical factors influencing corporate performance and strategic direction. Amidst growing scrutiny, the roles of board independence and gender diversity, particularly the presence of women in board chair positions, have garnered significant attention (see, for example, Adams & Ferreira, 2009; Carter et al., 2010; Joecks et al., 2013; Post & Byron, 2015). These aspects are considered vital for enhancing decision-making processes, fostering innovation, inclusivity, and ensuring a balanced representation of interests within firms. The significance of these factors extends beyond compliance and ethical considerations, touching upon the core of effective decision-making and strategic orientation within firms (Bear et al. 2010; Warring & Ramsay, 2018). Thus, it is imperative to delve into the intricate relationship between board size, firm profitability, and their impact on board independence and gender diversity, with a particular focus on the variation across different sectors. The rationale behind this exploration is grounded in the hypothesis that more profitable firms or those with larger boards might exhibit distinct governance practices and approaches to diversity compared to their counterparts.

Despite the growing body of literature emphasizing the importance of board independence and gender diversity, there is a notable gap in understanding how board size and firm profitability influence these corporate governance attributes. Furthermore, the variation of these effects across different sectors remains underexplored. This gap presents a critical issue as it undermines the ability of stakeholders to formulate and implement effective governance strategies that align with the dual goals of enhancing board functionality and promoting gender diversity. Addressing this gap is essential for developing a more nuanced understanding of the mechanisms through which board size and profitability impact governance practices and diversity initiatives in financial and non-financial sector institutions.

The general objective of this study is to investigate the dynamics of board composition and firm performance by examining the effects of board size and firm profitability on governance practices, particularly focusing on board independence and gender diversity, across the financial sector and non-financial sector contexts of listed companies in Ghana. The specific objectives are to analyse the relationship between board size and board independence of listed firms in the financial sector and their counterparts in the non-financial sector; evaluate the impact of firm profitability on the presence of women in corporate boards, considering sector-

specific variations; and explore the interplay between board size, profitability, and sector type in shaping corporate governance practices, with a focus on board independence and gender diversity.

In line with the stated objectives, this study seeks to provide empirical answers to the following research questions within the Ghanaian context: Does board size significantly influence the level of board independence among listed firms, and does this effect differ between financial and non-financial institutions? To what extent does firm profitability affect the likelihood of appointing a woman as board chair? What sectoral patterns can be observed in the adoption of corporate governance practices relating to board independence and gender diversity across industries?

The significance of this study lies in the fact that it provides a comparative analysis between financial and non-financial institutions, which enhances the understanding of sectoral differences in governance practices. This aspect of the study fills a gap in the literature, as previous studies have not extensively explored this sector-specific governance dynamics. Again, the use of a robust econometric analysis is a methodological strength, allowing for the estimation of interconnected equations and accounting for potential correlations between the error terms of different equations, thus offering more efficient and accurate estimations. The study contributes to resolving inconsistencies in the literature regarding the effects of profitability, board size, independence, and gender diversity on corporate governance. For instance, it challenges the notion that profitability always enhances board independence or that larger boards necessarily improve diversity. The findings on female leadership's varying impact on financial and non-financial sectors add nuance to the current understanding of gender dynamics in governance.

The rest of the paper is structured as follows: Literature review, methodology, results and discussions, and conclusion.

LITERATURE REVIEW

Board size and board independence in sector-sensitive corporate governance

Board size and board independence are central design features of corporate governance because they condition a board's capacity to monitor management, provide expert counsel, and steer strategy under varying institutional and sector constraints. Board size captures the number of

directors, while board independence reflects the presence of non-executive/independent directors who are less encumbered by managerial ties. Their linkage is theoretically ambiguous: agency theory frames independence as a monitoring device that reduces agency costs and managerial opportunism, whereas resource dependence theory emphasises how larger boards can expand access to specialised expertise, external networks, and legitimacy, resources that may reinforce both oversight and advisory roles (Jensen & Meckling, 1976; Pfeffer & Salancik, 1978).

From an agency perspective, enlarging boards can strengthen monitoring *only* to the extent that growth increases the number and influence of independent directors and improves information access. Yet beyond some point, coordination frictions, slower deliberation, and free-rider incentives can erode “effective” independence even where formal independence appears high (Jensen, 1993; Dalton et al., 1999). Resource dependence scholarship, by contrast, predicts that larger boards can enable more independent oversight by broadening cognitive diversity and strengthening boundary-spanning links, especially valuable in complex or highly regulated settings, while strategic governance research reframes the issue as an optimisation problem: effective governance requires balancing breadth of expertise with decision-making efficiency (Hillman et al., 2000; Forbes & Milliken, 1999).

Empirical evidence mirrors these competing logics. In developed markets, smaller boards have been associated with stronger monitoring and higher valuation, consistent with coordination advantages (Yermack, 1996; Dalton et al., 1999). However, other studies show boards expand with organisational complexity and that expansion often coincides with higher independent representation, supporting a contingency-based resource dependence view (Coles et al., 2008; Adams & Mehran, 2012). This heterogeneity is intensified by sectoral governance regimes. In banking and other financial institutions, systemic-risk concerns and prudential supervision elevate the governance burden; evidence suggests board size and independence matter for performance and risk management, while overly large boards can still weaken monitoring despite nominal independence (Adams & Mehran, 2012).

Ghanaian evidence strengthens the case for sector-sensitive interpretation. For listed firms, board architecture has measurable market implications: board size is negatively associated with stock return volatility (Doku et al., 2023), and governance/ownership structures shape performance (Darko et al., 2016). Sectoral nuance also emerges within Ghana: in listed

manufacturing, board size may be performance-neutral while board independence is performance-enhancing (Aidoo et al., 2024), implying that independence delivers value when substantively empowered. In the financial sector, the Bank of Ghana's Corporate Governance Directive sets composition and independence thresholds, making independence partly policy-driven relative to non-financial institutions, where structures are more discretionary (Bank of Ghana, 2018). Finally, independence operates within a broader governance ecosystem: in Ghanaian financial institutions, it predicts governance disclosures, but its performance effects are conditional on ownership and other controls, and high non-executive counts do not always translate into effective monitoring (Aikins, 2023; Darko et al., 2016).

Gender board diversity under sector-specific governance pressures

The theoretical and empirical relationship between firm profitability and women's representation on corporate boards, particularly within the context of sector-specific governance pressures. The central proposition is grounded in a selection logic rather than a purely performance-effect view: profitable firms possess greater discretionary slack to broaden director search processes, invest in governance reforms, and attract scarce female board talent, thereby increasing the likelihood of appointing women directors and board chairs (Pfeffer & Salancik, 1978). From a legitimacy perspective, financially strong firms may also adopt gender-inclusive leadership as a visible governance signal to reinforce their reputational standing (Suchman, 1995). However, agency-based arguments caution that profitability can entrench managerial discretion and incumbency, potentially reducing incentives for board diversification when shareholder pressure is weak (Jensen & Meckling, 1976).

A critical issue discussed is endogeneity: women's board participation can be both a determinant and a consequence of firm performance. Evidence suggests that women directors enhance board monitoring intensity and governance quality, implying possible reverse causality in models that treat profitability as an antecedent (Adams & Ferreira, 2009). Meta-analytic findings confirm that the association between board gender diversity and financial performance is mixed and highly context-dependent (Post & Byron, 2015). Recent causal and quasi-experimental studies further demonstrate that the performance effects of women directors vary with institutional and sectoral environments, underscoring that observed profitability-gender links often reflect structural or policy-driven factors rather than universal mechanisms (Yang et al., 2019; Yami et al., 2025).

Empirical scholarship increasingly highlights sectoral heterogeneity. Cross-country studies identify industry membership and governance regimes as key determinants of women's board nominations, suggesting that board gender outcomes are shaped by institutional opportunity structures as much as financial capacity (López-Cabarcos et al., 2023; Michalička et al., 2022). In the financial sector, reputational scrutiny and regulatory oversight heighten the salience of gender diversity as a governance signal, potentially altering the profitability–diversity relationship.

Within Ghana, descriptive and policy-oriented evidence provides strong motivation for examining this link. The IFC/World Bank report documents persistent under-representation of women in Ghanaian board leadership, while the Ghana Board Diversity Index (2025) shows gradual improvements in overall female board participation but a decline in women's board chair representation (TheBoardroom Africa, 2025). Notably, companies chaired by women are significantly more likely to meet the 30% gender-balance benchmark, highlighting leadership as a lever for broader diversity outcomes. Sector-specific evidence also suggests that gender diversity interacts with risk governance and performance outcomes in regulated financial institutions, further supporting a sector-sensitive analytical framework (Dang et al., 2023).

Overall, the review of the literature establishes that profitability influences women's board representation through slack-resource, legitimacy, and signalling mechanisms, yet the direction and magnitude of this relationship are conditioned by sectoral governance pressures and institutional constraints.

Effects of board size, and sector type on board independence and gender diversity

Corporate governance scholarship increasingly treats board composition as an outcome of *joint* firm- and context-level forces rather than a fixed design choice. Accordingly, analysing board size and profitability as interacting determinants of board independence and gender diversity, while allowing effects to vary by sector, aligns with evidence that boards adapt to organisational complexity, external constraints, and performance signals (Boone et al., 2007; Linck et al., 2008).

Theoretically, agency logic predicts that independence strengthens monitoring and curbs managerial opportunism, but the monitoring value of adding directors is not monotonic: larger boards may dilute accountability through coordination costs and free-riding, weakening

effective independence even when formal independence rises (Jensen & Meckling, 1976; Jensen, 1993; Dalton et al., 1999). Resource dependence theory instead anticipates that larger boards expand informational resources, external ties, and legitimacy, features that can simultaneously support more independent oversight and widen nomination networks for women directors, especially where operations are complex and regulation is salient (Pfeffer & Salancik, 1978; Hillman et al., 2000; Coles et al., 2008). Complementarily, stakeholder and legitimacy perspectives suggest that independence and gender diversity serve as visible accountability signals, prompting firms to strengthen both when stakeholder scrutiny intensifies (Freeman, 1984; Suchman, 1995).

Empirically, this contingency view is consistent with findings that smaller boards can enhance monitoring and valuation, whereas larger boards often reflect higher advisory needs in complex firms (Yermack, 1996; Adams & Mehran, 2012). In Ghana, governance architecture carries measurable market implications: board size and independence jointly shape stock return volatility, and board/ownership structures matter for performance, implying that structural choices are consequential rather than cosmetic (Doku et al., 2023; Darko et al., 2016).

Profitability further conditions these relationships. Slack-resources and signalling arguments imply that profitable firms can broaden searches and invest in governance reforms that increase independent and female appointments (Post & Byron, 2015). Yet profitability may also entrench incumbents and managerial power, muting diversification incentives (Adams & Ferreira, 2009; Nguyen et al., 2020). In Ghana, ownership structure and firm size jointly shape governance capacity, with stronger structural effects in the financial sector (Adenutsi, 2024). Sector type, therefore, operates as a critical boundary condition: prudential oversight and systemic-risk sensitivities make banking governance partly policy-driven, given explicit board-size and independence prescriptions (Bank of Ghana, 2018), while non-financial firms face more discretionary governance choices. Recent Ghanaian evidence links gender diversity and ownership to bank stability, alongside national reports showing improving women's representation but persistent leadership gaps, especially outside finance (Adenutsi et al., 2024; IFC, 2018; TheBoardroom Africa, 2025).

The literature shows that board size, independence, and gender diversity are interconnected governance mechanisms shaped by firm performance and sectoral regulation. Agency theory stresses the monitoring role of independence but cautions that very large boards may weaken

oversight, while resource dependence and stakeholder theories highlight how larger, diverse boards enhance expertise and legitimacy. Empirical evidence, especially from Ghana's financial sector, confirms that these relationships are non-linear and policy-contingent, supporting a sector-sensitive framework for the methodology.

METHODS

Theoretical Framework

This study conceptualises corporate governance as a system of jointly determined institutional outcomes, where board independence and board gender diversity emerge endogenously from a firm's internal governance architecture, ownership structure, performance characteristics, and sectoral regulatory environment. Formally, the board is treated as an organisational mechanism that allocates monitoring power, representation, and control across heterogeneous stakeholders under institutional constraints.

Board Governance as a Joint Outcome System

Let each firm $i = 1, \dots, N$ observed over time $t = 1, \dots, T$ possess a latent governance structure G_{it} , which manifests through two observable and interdependent outcomes: $G_{it} = \{BIndep_{it}, BGDiv_{it}\}$, where $BIndep_{it} \in (0,1)$ denotes the proportion of independent (non-executive) directors; and $BGDiv_{it} \in (0,1)$ denotes the proportion of female directors. These outcomes are not independent design choices but arise from a common governance production function, reflecting overlapping theoretical mechanisms from Agency Theory, Resource Dependence Theory, Stakeholder Theory, and Institutional Theory

Governance Production Functions

Define two structural governance functions:

$$BIndep_{it} = f_1(\Omega_{it}, \Phi_{it}, X_{it}) + \varepsilon_{2,it} \quad (1)$$

$$BGDiv_{it} = f_2(\Omega_{it}, \Phi_{it}, X_{it}) + \varepsilon_{1,it} \quad (2)$$

where, *Ownership Structure Vector*, $\Omega_{it} = \{FOwn_{it}, GOwn_{it}, SShares_{it}\}$, captures control rights and power concentration, representing agency-based monitoring incentives; *Board Architecture Vector*, $\Phi_{it} = \{BSize_{it}, FBCL_{it}\}$, captures internal governance design, representing resource access, leadership signalling, and nomination dynamics, and *Firm & Institutional*

Controls, $X_{it} = \{F Profit_{it}, FSzie_{it}, Sector_{it}\}$, captures performance capacity and institutional environment.

Structural Interdependence and Error Correlation

Governance outcomes are subject to shared latent institutional shocks, such that, $Cov(\varepsilon_{1,it}, \varepsilon_{2,it}) \neq 0$. This reflects that unobserved factors (e.g. regulatory reforms, reputational crises, governance codes, political pressures) simultaneously influence both independence and diversity. Hence, governance outcomes form a bivariate structural system, not two independent regressions.

Reduced-Form Mathematical Specifications

The theoretical model yields the following linearised reduced forms, specified as Equations (4) and (5). This structure corresponds exactly to the PSUR system estimated for the empirics.

Theoretical Mechanisms Embedded in the Model

Agency Mechanism

Ownership concentration increases demand for independent monitoring, such that $\frac{\partial BIndep_{it}}{\partial \Omega_{it}} > 0$, but may suppress representational inclusiveness. Thus, $\frac{\partial BGDiv_{it}}{\partial \Omega_{it}} < 0$, reflecting control-driven nomination incentives.

Resource Dependence Mechanism

Larger boards expand director search space, $\frac{\partial BGDiv_{it}}{\partial BSize_{it}} > 0$, $\frac{\partial BIndep_{it}}{\partial BSize_{it}} > 0$, through network diversity and expertise pooling.

Leadership Signalling Mechanism

Female board chair leadership shifts nomination norms, $\frac{\partial BGDiv_{it}}{\partial FBCL_{it}} > 0$, $\frac{\partial BIndep_{it}}{\partial FBCL_{it}} > 0$, capturing both symbolic legitimacy and real governance reform.

Institutional Sector Effect

Regulatory regimes condition governance elasticities, $\frac{\partial G_{it}}{\partial X_{it}}|_{Sector=1} \neq \frac{\partial G_{it}}{\partial X_{it}}|_{Sector=0}$,

reflecting stronger prudential governance in financial institutions.

The Governance System Interpretation

The model implies that board independence and gender diversity are joint governance equilibria, produced by internal design variables (*BSize*, *FBCL*), moderated by ownership power structures, conditioned by institutional sector constraints, and subject to common latent shocks. Thus, governance quality is not reducible to a single dimension, but emerges from a

multivariate structural system, $G_{it} = F(\Omega_{it}, \Phi_{it}, X_{it}) + \varepsilon_{it}$, where $\varepsilon_{it} = \begin{bmatrix} \varepsilon_{1,it} \\ \varepsilon_{2,it} \end{bmatrix}$, $\Sigma = \begin{bmatrix} \sigma_{11} & \sigma_{12} \\ \sigma_{21} & \sigma_{22} \end{bmatrix}$,

with $\sigma_{12} = \sigma_{21} \neq 0$, justifying the PSUR estimator.

This mathematical framework formally establishes that board gender diversity and independence are not substitutes but co-produced governance outputs; leadership diversity (female chair) is a structural governance lever, not merely symbolic; ownership structures generate asymmetric effects: monitoring can improve without inclusion; and sectoral institutions reshape governance elasticities, validating a regime-sensitive model. The framework, therefore, extends classical corporate governance theory by modelling boards as endogenous institutional systems, rather than static compliance mechanisms.

Research Design, Sample, Data Sources, and variable operationalisation

The study employs a quantitative panel design using a balanced firm-year dataset from 26 Ghana Stock Exchange (GSE) listed companies observed over 2011–2022, comprising 11 financial institutions and 15 non-financial institutions. Financial institutions include commercial banks, insurance companies, and a trade finance company, while non-financial firms span produce buying, beverages, merchandising, publishing, manufacturing, mining, oil and gas, and food processing. Data were obtained from audited annual financial statements and certified annual reports available through firm databases and the GSE, with inclusion conditional on consistent data availability across the study window.

Board governance outcomes are captured by board gender diversity (BGDiv) measured as the percentage of females or women on the board of a firm listed on the GSE, and board independence (BIndep) measured as the proportion of non-executive directors on the board of a listed firm. Key explanatory variables include board size (BSize), which was measured as the number of directors on a board, and female board chair leadership (FBCL) proxied by a binary for which 1 if the board is chaired by a female or a woman, and 0 otherwise. Ownership structure indicators (FOwn, GOwn, SShares), performance (FProfit), firm size (FSize), and sector type (Sector) were the other explanatory variables. Foreign-owned firm was captured by a binary variable which equals 1 if the firm is controlled by foreigners, 0 otherwise; government-owned firm was captured similarly, a binary which equals 1 if the firm is controlled by the government, 0 otherwise; substantial shareholding was measured as the percentage of shares held by substantial shareholders (5% and above); firm profit was measured as the annual percentage change in return (profit before interest and tax divided by total assets); natural logarithm of total assets was the measure of firm size, while a dummy variable which equals 1 if a firm is a financial institution, 0 otherwise.

Econometric Strategy and Model Specification

The General Modelling Framework

Equation 3 represents the baseline panel-data model for estimating the set of variables encompassing corporate governance measures, board characteristics, and other firm-specific structures and performance indicators.

$$Y_{it} = \phi + \beta A_{it} + \beta \Phi_{it} + \beta X_{it} + \mu_{it} \quad (3)$$

In this case Y_{it} is an $n \times 1$ matrix of the dependent variable, which is either board diversity (*BGDiv*) or board independence (*BIndep*) of a sampled GSE-listed firm i in a specific year t ; A_{it} is an $n \times k_1$ matrix of corporate governance variables such as ownership and shareholding structures; Φ_{it} is a matrix of dimension $n \times k_2$ whose elements are measures of board characteristics (e.g., board size and female as the board chairperson); X_{it} is an $n \times k_3$ matrix of control variables such as firm profit, firm size, and sector of operation); μ_{it} is the idiosyncratic stochastic term; and $k_1 + k_2 + k_3 = k$ representing the total number of explanatory variables included in the final model. Equation 1 has been transformed into a variety of specifications on which pooled ordinary least squares (OLS) regressions have been employed for the purpose of empirical testing. The robust-cluster standard errors have been reported since it facilitates heteroskedasticity and serial correlation consistent standard errors.

The Empirical Panel Seemingly Unrelated (PSUR) Model

The Panel Seemingly Unrelated Regression (PSUR) model is an extension of the standard SUR model, designed to handle panel data. This model is particularly useful when dealing with multiple equations whose error terms are correlated across equations but not necessarily within the same time-period for a given equation. The use of a panel SUR model in this context, with the specified dependent and independent variables, allows for a comprehensive analysis of how these variables interact across different firms and over time. Given the dependent variables, independent variables, panel data characteristics, and the period mentioned, the panel-data specific SUR models are specified for two alternate explained variables as follows for each firm i over time t .

Empirical board diversity model

$$\begin{aligned} BGDiv_{it} = & \beta_{2,0} + \beta_{2,1}FOwn_{it} + \beta_{2,2}GOwn_{it} + \beta_{2,3}SShares_{it} + \beta_{2,4}BSize_{it} + \beta_{2,5}FBCL_{it} + \\ & \beta_{2,6}FPr ofit_{it} + \beta_{2,7}FSize_{it} + \beta_{2,8}Sector_{it} + \varepsilon_{2,it} \end{aligned} \quad (4)$$

Empirical board independence model

$$\begin{aligned} BIndep_{it} = & \beta_{1,0} + \beta_{1,1}FOwn_{it} + \beta_{1,2}GOwn_{it} + \beta_{1,3}SShares_{it} + \beta_{1,4}BSize_{it} + \beta_{1,5}FBCL_{it} + \\ & \beta_{1,6}FPr ofit_{it} + \beta_{1,7}FSize_{it} + \beta_{1,8}Sector_{it} + \varepsilon_{1,it} \end{aligned} \quad (5)$$

Here, $BDiv_{it}$ and $BIndep_{it}$ are the dependent variables for firm i at time t ; $FSize_{it}$, $FOwn_{it}$, $GOwn_{it}$, $SShares_{it}$, $FPr ofit_{it}$, $Sector_{it}$, $BSize_{it}$, $FBCL_{it}$ are the independent variables for firm i at time t ; $\beta_{j,k}$ represents the coefficient to be estimated for variable k in equation j ; and $\varepsilon_{j,it}$ is the error term for equation j for firm i at time t , which captures unobserved factors affecting the dependent variable.

A key justification for the empirical PSUR model is that the error terms ($\varepsilon_{1,it}$ and $\varepsilon_{2,it}$) across the two equations are correlated, hence using a PSUR model allows for more efficient estimation of the parameters by considering this correlation. This is crucial when analysing firm-level data, as shocks affecting one aspect of a firm's performance or behaviour (e.g., $BIndep$) might also affect other aspects (e.g., $BGDiv$). Secondly, by incorporating panel data (26 firms over 12 years), the model can account for both cross-sectional (between-firms) and time-series (within-firm over time) variations, and PSUR modelling improves the ability to

detect effects that may not be observable in purely cross-sectional or time-series data. Thirdly, PSUR model allows for different sets of independent variables to have varying impacts on each dependent variable. This flexibility is essential when the determinants of BGDIV and BIndep might interact with the independent variables differently due to underlying corporate governance features, board characteristics, managerial, or sectoral dynamics. Fourthly, including the sector as an independent variable and using panel data allows for the analysis of how sectoral differences and time trends influence the dependent variables. This is important for capturing industry-specific trends and the evolution of firm characteristics over time.

Overall, specifying a PSUR model for analysing the given variables allows for a nuanced understanding of how firm characteristics (size, ownership, profitability, etc.), sectoral distinctions, and governance structures (board size, presence of a woman chair) impact firm innovation behaviour (BIndep) and well-being or responsibility behaviour (BGDIV) while accounting for the complexities of panel data. This approach provides more accurate and efficient estimations by acknowledging the potential correlations across error terms of different equations, thereby offering richer insights into the dynamics at play.

The Panel Seemingly Unrelated Regression (SUR) model offers distinct advantages and disadvantages when compared to other panel econometric modelling techniques such as pooled Ordinary Least Squares (OLS), panel fixed effects, panel random effects, panel-corrected standard errors (PCSE), and system Generalised Method of Moments (GMM). The primary advantage of the Panel SUR over pooled OLS is its ability to account for the correlation between the error terms of different equations. This is particularly relevant when estimating multiple equations that are likely to be influenced by common unobservable factors. Pooled OLS, by contrast, ignores these correlations, which can lead to inefficient and potentially biased estimates if the unobserved factors affect the dependent variables differently (Zellner, 1962). Pooled OLS is straightforward and useful for single-equation models where cross-equation error correlations are not a concern. However, PSUR is superior when dealing with multiple interrelated dependent variables across panel data.

A crucial advantage of PSUR model over panel fixed effects lies in its efficiency gain from modelling the covariance structure across the equations. While panel fixed effects control for unobserved heterogeneity by allowing for individual-specific intercepts, it does not exploit the information contained in the covariance of the errors across different equations (Greene, 2018).

While fixed effects are preferable when the focus is on controlling for unobserved individual heterogeneity that could bias the estimated effects of observed variables, PSUR is chosen when the focus is on the relationships between multiple dependent variables and their shared influencers.

Like fixed effects, the Panel SUR model is more advantageous when the equations being estimated are interconnected through their error terms. Panel random effects assume that individual effects are uncorrelated with the regressors, an assumption that can be unrealistic in many economic applications. Panel SUR directly addresses the correlation between equations, providing more efficient estimates (Baltagi, 2005). Random effects are used when the unobserved individual effect is assumed to be uncorrelated with the independent variables, but PSUR is more appropriate for estimating multiple related outcomes.

Panel-Corrected Standard Errors (PCSE) adjust standard errors in panel data models to account for heteroskedasticity and autocorrelation within panels, but do not address the correlation across different dependent variable equations. Panel SUR, by modelling these correlations explicitly, can provide more precise estimates when the assumption of independent equations is violated (Beck & Katz, 1995). PCSE is useful for correcting standard errors in single equation models with panel data; nevertheless, PSUR is chosen for multi-equation models with correlated error terms.

System GMM is particularly powerful in addressing endogeneity and autocorrelation issues, especially in dynamic panel data models. However, it can be complex and sensitive to specification. Panel SUR offers a simpler alternative when the primary concern is the correlation of errors across equations rather than endogeneity or dynamic relationships (Arellano & Bover, 1995). System GMM is preferred in dynamic models where lagged dependent variables are used as regressors, and there is concern over endogeneity, but PSUR is beneficial for estimating multiple equations with correlated errors in a static context.

The Panel SUR model stands out for its ability to efficiently estimate multiple equations with correlated error terms, making it particularly useful in empirical research where such correlations are expected. It complements other panel data methodologies by providing a tool for analysing complex interdependencies between different dependent variables across panel data. While other methods may be more suitable for addressing issues, like unobserved

heterogeneity, endogeneity, or dynamics within panel data, the PSUR model offers a valuable approach for capturing the covariance structure across equations, leading to more accurate and insightful estimates.

Estimation approach and robustness strategy

Estimation proceeds with PSUR for the full sample and for sector-specific subsamples (financial vs non-financial). Robustness is assessed using pooled OLS, fixed effects, random effects, and panel-corrected standard errors (PCSE) specifications for the full sample and each sector subsample.

ANALYSIS

Prior to model estimation, diagnostic summaries were conducted to assess data completeness, variability, and potential outliers. The results show that the panel was balanced with 275 observations for each of the variables analysed. The pairwise correlation indices were statistically low, falling below 5.0 (except for -0.5919 in the case of firm profit and substantial shareholding). Given the panel structure and the risk of multicollinearity, pairwise correlations and variance inflation factors were computed to confirm that collinearity did not threaten inference. The empirical analysis was implemented in two stages. First, PSUR models were estimated for the full sample of 26 listed firms. Second, industry-specific PSUR estimations were conducted separately for financial institutions and non-financial firms to identify sectoral heterogeneity. Finally, robustness checks were performed using pooled OLS, fixed effects, random effects, and PCSE estimators for the full sample and each subsample. The results of the robustness tests are presented in Tables 2, 3, and 4 for listed financial institutions, non-listed financial institutions, and a combination of both (all listed firms), respectively.

FINDINGS

Table 1 presents the PSUR estimates for financial institutions, non-financial firms, and the pooled full sample. Across specifications, the system structure is empirically justified because the governance outcomes are jointly determined through correlated disturbances, as indicated by the reported residual correlation and the Breusch–Pagan test reported with the PSUR outputs.

Table 1: Estimated Results of the Panel Seeming Unrelated Regression

	<u>Financial Institutions</u>		<u>Non-Financial Institutions</u>		<u>All (Sampled Listed Firms)</u>	
	<u>BGDiv</u>	<u>BIndep</u>	<u>BGDiv</u>	<u>BIndep</u>	<u>BGDiv</u>	<u>BIndep</u>
Firm Size	-0.01559 (0.01094) -1.43	-0.03135 (0.01478) -2.12**	-0.01110 (0.01285) -0.86	-0.07498 (0.03361) -2.33**	-0.00499 (0.00726) -0.69	-0.06724 (0.01727) -3.89***
Government Ownership	-0.05757 (0.02997) -1.92**	0.17697 (0.04043) 4.38***	-0.10334 (0.04236) -2.44**	0.09391 (0.11078) 0.85	-0.11398 (0.02333) -4.77***	0.10 (0.04599) 2.27**
Foreign Ownership	-0.03576 (0.03035) -1.18	0.17760 (0.04102) 4.33***	-0.07495 (758) -1.99**	0.13554 (0.09829) 1.38	-0.05903 (0.02039) -2.90***	0.09703 (0.04887) 1.99**
Substantial Shares	0.41785 (0.10195) 4.10***	-0.36975 (0.113779) -2.68***	-0.03706 (0.05451) 0.68	0.406448 (0.14257) 2.85***	-0.08839 (0.04212) -2.10**	0.26762 (0.10094) 2.65***
Firm Profit	0.00198 (0.00243) 0.81	0.00189 (0.00328) 0.58	-0.00080 (0.00960) -0.08	0.00894 (0.02512) 0.36	0.00289 (0.0277) 1.04	0.00401 (0.00664) 0.60
Board Size	0.01735 (0.00656) 2.64***	0.02713 (0.00886) 3.06***	-0.00646 (0.0678) -0.95	0.08007 (0.01774) 4.51***	0.02741 (0.00442) 6.20***	0.06742 (0.01060) 6.36***
Female Board Chair Leadership	0.04124 (0.01881) 2.19**	0.02121 (0.00525) 4.04***	0.05249 (0.01125) 4.67***	0.80848 (0.02942) 27.48***	0.05167 (0.01041) 4.96***	0.77065 (0.02495) 30.89***
Sector					0.03991 (0.01655) 2.41**	0.06100 (0.03967) 1.54
Constant	-0.06710 (0.08048) 0.83	0.81417 (0.10876) 7.49***	0.43165 (0.11657) 3.70***	0.07015 (0.30489) 0.23	0.23097 (0.05944) 3.89***	0.23710 (0.14247) 1.66*
	<i>Observations</i>	<i>R-Squared</i>	<i>Observations</i>	<i>R-Squared</i>	<i>Observations</i>	<i>R-Squared</i>
<i>BGDiv</i>	132	0.3736	180	0.2607	312	0.663
<i>BIndep</i>	132	0.5935	180	0.8168	312	0.861
<i>Correlation of Residuals</i>	0.367**		-0.5195***		-0.4870***	
<i>Breuch-Pagan Test</i>	0.005		48.572***		46.735***	

Source: Author's estimates ***/**/* denotes significant at 1%, 5% and 10%

In the context of financial institutions, the results indicate that board size and female board chair leadership are positively associated with both board gender diversity and board independence, and while firm size, foreign ownership, and firm profit have no significant impact, government ownership undermines board gender diversity. Similarly, government ownership, foreign ownership, board size, and female board chair leadership enhance board independence, but firm size and substantial shareholding are negatively associated with this governance outcome.

For non-financial firms, whereas female board chair leadership promotes board gender diversity, government ownership and foreign ownership negatively impact board gender diversity, while substantial shareholding, firm size, board size, and firm profit were statistically insignificant. Again, female board chair leadership, board size, and substantial shareholding positively impact board independence, while firm size deters board independence, with government ownership, foreign ownership, and firm profit having no significant impact in this subsample.

In the pooled (full sample) estimation, ownership structures (government, foreign, or dominant shareholding) negatively impact board gender diversity, while board size, female board chair leadership, and sector characteristics (being a financial institution) promote board gender diversity. Except for firm size, which undermines board independence, and firm profit and being a financial institution, all the other explanatory variables (government ownership, foreign ownership, substantial shareholding, board size, and female board chair leadership) significantly promote board independence.

The robustness results in Tables 2–4 confirm the stability of the main PSUR findings in Table 1 across pooled OLS, fixed effects, random effects, and PCSE estimators. In financial institutions, board size and female board chair leadership consistently and positively influence both board gender diversity and board independence. In non-financial firms, female chair leadership remains strongly significant for both outcomes, while board size robustly strengthens independence. In the pooled sample, ownership concentration continues to reduce gender diversity but promotes board independence, replicating the core patterns in Table 1.

Overall, the direction and statistical significance of the principal variables remain largely unchanged across specifications. Any variations in coefficient magnitude do not affect substantive inference. The robustness analysis, therefore, reinforces the credibility of the main conclusion that internal board architecture, particularly board size and female board chair leadership, is the most stable determinant of inclusive and independent governance.

Table 2: Robustness Analysis of Listed Financial Institutions

	BOARD GENDER DIVERSITY				BOARD INDEPENDENCE			
	Pooled OLS	Fixed Effect	Random Effect	PCSE	Pooled OLS	Fixed Effect	Random Effect	PCSE
Firm Size	-0.01559 (0.01128) [-1.38]	0.10312 (0.02999) [3.44]***	-0.01559 (0.01128) [-1.38]	-0.01559 (0.00919) [-1.70]*	-0.03135 (0.01525) [-2.06]**	0.12137 (0.02956) [4.11]***	-0.02698 (0.01424) [-1.89]*	-0.03135 (0.01559) [-2.01]**
Government Ownership	-0.03757 (0.03086) [-1.22]	0.00000 (omitted) (omitted)	-0.03757 (0.03086) [-1.22]	-0.03757 (0.02669) [-1.41]	0.17697 (0.04171) [4.24]***	0.00000 (omitted) (omitted)	0.2149 (0.10368) [2.07]**	0.17697 (0.03513) [5.04]***
Foreign Ownership	-0.03576 (0.03131) [-1.14]	0.00000 (omitted) (omitted)	-0.03576 (0.03131) [-1.14]	-0.03576 (0.02326) [-1.54]	0.17760 (0.04232) [4.20]***	0.00000 (omitted) (omitted)	0.14673 (0.07436) [1.73]*	0.17760 (0.02948) [6.02]***
Substantial Shares	0.41785 (0.10519) [3.97]***	0.37406 (0.15137) [2.47]**	0.41785 (0.10519) [3.97]***	0.41785 (0.09322) [4.48]***	-0.36975 (0.14217) [-2.60]**	0.45696 (0.14921) [3.06]***	0.20298 (0.15458) [1.31]	-0.36975 (0.13979) [-2.65]**
Firm Profit	0.00198 (0.00251) [0.79]	-0.00009 (0.00239) [-0.04]	0.00198 (0.00251) [0.79]	0.00198 (0.00180) [1.18]	0.00189 (0.00339) [0.56]	-0.00297 (0.00235) [-1.26]	-0.00114 (0.00258) [-0.44]	0.00189 (0.00279) [0.68]
Board Size	0.01732 (0.00677) [2.56]**	-0.00240 (0.01056) [-0.23]	0.01732 (0.00677) [2.56]**	0.01732 (0.00482) [3.59]***	0.02713 (0.00915) [2.97]***	-0.01612 (0.00147) [10.97]***	0.07089 (0.01020) [6.95]***	0.02713 (0.00670) [4.05]***
Female Board Chair Leadership	0.04124 (0.00404) [10.21]***	0.06719 (0.04005) [1.68]*	0.04124 (0.00404) [10.21]***	0.04124 (0.00424) [9.73]***	0.02121 (0.00541) [3.92]***	-0.01225 (0.03948) [-0.31]	0.00437 (0.00017) [25.71]***	0.02121 (0.00358) [5.92]***
Constant	-0.06710 (0.08303) [-0.81]	-0.95976 (0.23701) [-4.05]***	-0.06710 (0.08303) [-0.81]	-0.06710 (0.05917) [-1.13]	0.81417 (0.11222) [7.26]***	-0.60263 (0.23363) [-2.58]**	-0.06731 (0.20176) [-0.33]	0.81417 (0.11380) [7.15]***
R-squared	0.1736	0.2157	0.5013	0.1736	0.3935	0.2098	0.1439	0.3935
Corr (u_i, X_b)	not applicable	-0.8848***	0.0000(assumed)	not applicable	not applicable	0.8138***	0.0000(assumed)	not applicable
F-statistic	not applicable	6.38***	not applicable	not applicable	not applicable	6.16***	not applicable	not applicable
Wald (χ²)	not applicable	not applicable	26.05***	59.54***	not applicable	not applicable	13.13***	362.85***
Hausman (χ²)	not applicable	448.24 {0.0000}***		not applicable	not applicable	144.42 {0.0000}***		not applicable

Source: Author's estimation

Note: ***/**/* denotes statistically significant at 1%, 5%, and 10% respectively

Table 3: Robustness Analysis of Listed Non-Financial Institutions

	BOARD GENDER DIVERSITY				BOARD INDEPENDENCE			
	Pooled OLS	Fixed Effect	Random Effect	PCSE	Pooled OLS	Fixed Effect	Random Effect	PCSE
Firm Size	-0.01110 (0.01315) [-0.84]	0.16360 (0.02448) [6.68]***	0.10602 (0.02167) [4.89]***	-0.01110 (0.01340) [-0.83]	-0.07495 (0.03439) [-2.18]**	-0.08690 (0.05819) [-1.48]	-0.08754 (0.05267) [-1.66]*	-0.07495 (0.01827) [-4.10]***
Government Ownership	-0.10334 (0.04333) [-2.39]**	0.00000 (omitted) (omitted)	-0.33251 (0.08775) [-3.79]***	-0.10334 (0.03371) [-3.07]***	0.09391 (0.11333) [0.33]	0.00000 (omitted) (omitted)	0.10851 (0.25718) [0.42]	0.09391 (0.06281) [1.49]
Foreign Ownership	-0.07495 (0.03844) [-1.95]*	0.00000 (omitted) (omitted)	-0.31420 (0.07884) [-3.99]***	-0.07495 (0.02926) [-2.56]**	0.13554 (0.10055) [1.35]	0.00000 (omitted) (omitted)	0.25033 (0.23131) [1.08]	0.13554 (0.04761) [2.85]***
Substantial Shares	-0.03706 (0.05576) [-0.66]	-0.42447 (0.17258) [2.46]**	-0.17194 (0.12012) [-1.43]	-0.03706 (0.02870) [-1.29]	0.40645 (0.1484) [2.79]***	1.34168 (0.41025) [3.27]***	0.90600 (0.31638) [2.86]***	0.40645 (0.09272) [4.38]***
Firm Profit	-0.00080 (0.00983) [-0.08]	-0.00959 (0.00672) [-1.43]	-0.00530 (0.00704) [-0.75]	-0.00080 (0.01247) [-0.06]	0.00894 (0.00270) [0.35]	-0.00476 (0.01597) [0.30]	-0.00433 (0.015917) [0.27]	0.00894 (0.00804) [1.11]
Board Size	-0.00646 (0.00637) [-0.93]	-0.00290 (0.00643) [0.45]	0.00340 (0.00653) [0.52]	-0.00646 (0.00540) [-1.20]	0.08007 (0.01814) [4.41]***	0.05095 (0.01593) [3.33]***	0.05537 (0.01495) [3.70]***	0.08007 (0.01153) [6.95]***
Female Board Chair Leadership	0.05249 (0.01151) [4.65]***	0.06719 (0.00824) [3.01]***	0.02914 (0.00866) [3.36]***	0.05249 (0.01128) [4.65]***	0.80848 (0.03009) [26.97]***	0.8812 (0.01960) [44.97]***	0.87912 (0.01956) [44.95]***	0.80848 (0.80848) [22.32]***
Constant	0.43165 (0.11925) [3.62]***	-0.81855 (0.22359) [-3.66]***	-0.32761 (0.17610) [-1.86]*	0.43165 (0.12950) [3.33]***	0.07015 (0.31190) [0.22]	-0.16830 (0.53152) [-0.32]	-0.02372 (0.44123) [-0.05]	0.07015 (0.18549) [0.36]
R-squared	0.2607	0.3050	0.2854	0.2607	0.8168	0.9299	0.9294	0.8168
Corr (u_i, X_b)	not applicable	-0.8893***	0.0000(assumed)	not applicable	not applicable	0.3675***	0.0000(assumed)	not applicable
F-statistic	not applicable	14.05***	not applicable	not applicable	not applicable	424.19***	not applicable	not applicable
Wald (χ²)	not applicable	not applicable	48.79***	485.91***	not applicable	not applicable	2104.44***	699.12***
Hausman (χ²)	not applicable	27.01{0.0000}***	not applicable	not applicable	not applicable	-7.88{0.0000}***	not applicable	not applicable

Source: Author's estimation

Note: ***/**/* denotes statistically significant at 1%, 5%, and 10% respectively

Table 4: Robustness Analysis of Listed Companies (The Full Sample: 11 Financial + 15 Non-Financial Firms)

	BOARD GENDER DIVERSITY				BOARD INDEPENDENCE			
	Pooled OLS	Fixed Effect	Random Effect	PCSE	Pooled OLS	Fixed Effect	Random Effect	PCSE
Firm Size	-0.00499 (0.00731) [-0.68]	0.12663 (0.01788) [7.08]***	0.05960 (0.01375) [4.33]***	-0.00499 (0.00644) [-0.77]	-0.06724 (0.01753) [-3.84]***	0.01500 (0.04046) [-0.37]	-0.03974 (0.02182) [-1.82]*	-0.06724 (0.01227) [-5.48]***
Government Ownership	-0.11138 (0.02371) [-4.70]***	0.00000 (omitted) (omitted)	-0.20773 (0.05661) [-3.61]***	-0.11138 (0.01753) [-6.35]***	0.10442 (0.05682) [1.84]*	0.00000 (omitted) (omitted)	0.09983 (0.04024) [2.48]***	0.10442 (0.03825) [2.73]***
Foreign Ownership	-0.05903 (0.02069) [-2.85]***	0.00000 (omitted) (omitted)	-0.13428 (0.05013) [-2.68]***	-0.05903 (0.01201) [-4.92]***	0.09703 (0.10243) [1.96]**	0.00000 (omitted) (omitted)	0.10642 (0.12442) [0.86]	0.09703 (0.02151) [4.51]***
Substantial Shares	0.06039 (0.04274) [1.41]	0.08034 (0.11357) [0.71]	0.05971 (0.08285) [0.72]	0.06039 (0.02952) [2.05]**	0.26762 (0.10243) [2.61]***	0.90816 (0.25696) [3.53]***	0.56361 (0.19303) [2.92]***	0.26762 (0.05349) [5.00]***
Firm Profit	0.002890 (0.00281) [1.03]	-0.00109 (0.00215) [-0.51]	0.00082 (0.00222) [0.37]	0.002890 (0.00176) [1.64]*	0.00402 (0.00674) [0.60]	0.00012 (0.00487) [0.03]	0.00073 (0.00486) [0.15]	0.00402 (0.00377) [1.07]
Board Size	0.00274 (0.00449) [0.61]	-0.00351 (0.00552) [-0.64]	0.00274 (0.00527) [0.52]	0.00274 (0.00254) [1.08]	0.06742 (0.01075) [6.27]***	0.03733 (0.01250) [2.99]***	0.04532 (0.01172) [3.87]***	0.06742 (0.00712) [9.47]***
Female Board Chair Leadership	0.05167 (0.01056) [4.89]***	0.02719 (0.00860) [3.16]***	0.03355 (0.00887) [3.78]***	0.05167 (0.01190) [4.31]***	0.77065 (0.02532) [30.44]***	0.8324 (0.01946) [42.77]***	0.82960 (0.01942) [42.71]***	0.77065 (0.04047) [19.04]***
Sector	0.03991 (0.01680) [2.38]**	0.00000 (omitted) (omitted)	-0.03224 (0.04207) [-0.77]	0.03991 (0.00970) [4.11]***	0.06100 (0.04026) [1.52]	0.00000 (omitted) (omitted)	0.05526 (0.01446) [3.82]***	0.06100 (0.03442) [1.77]*
Constant	0.23097 (0.06032) [3.83]***	-0.87468 (0.15750) [-5.55]***	-0.22072 (0.11060) [-2.00]**	0.23097 (0.05979) [3.86]***	0.23710 (0.14457) [1.64]*	-0.28585 (0.35635) [-0.80]	-0.00759 (0.25866) [-0.03]	0.23710 (0.09725) [2.44]**
R-squared	0.1630	0.2182	0.1915	0.1630	0.7609	0.8716	0.8706	0.7609
Corr (u_i, X_b)	not applicable	0.8601***	0.0000(assumed)	not applicable	not applicable	-0.2946***	0.0000(assumed)	not applicable
F-statistic	not applicable	14.49***	not applicable	not applicable	not applicable	381.64***	not applicable	not applicable
Wald (χ²)	not applicable	not applicable	49.38***	268.03***	not applicable	not applicable	1874.27***	788.11***
Hausman (χ²)	not applicable	39.61 {0.0000}***	not applicable	not applicable	not applicable	-16.48 {0.0000}***	not applicable	not applicable

Source: Author's estimation

Note: ***/**/* denotes statistically significant at 1%, 5%, and 10% respectively

DISCUSSION OF RESULTS

This study examined how board structure and ownership configuration shape board gender diversity and board independence among Ghanaian listed firms, and whether these relationships vary across financial and non-financial sectors. The results provide important insights into how governance operates in an emerging market context where ownership concentration, political influence, and institutional expectations interact with internal board dynamics. Overall, the evidence shows that internal board characteristics, especially board size and female board chair leadership, are key drivers of both inclusion and independence, while ownership structures can either constrain or reinforce these outcomes, depending on sectoral and institutional conditions.

Board size emerges as a central structural determinant of governance quality. In financial institutions, larger boards are associated with greater board gender diversity and stronger board independence. This supports the argument that increasing board size expands the pool of potential directors and allows firms to incorporate both monitoring capacity and diverse representation. In highly regulated financial sectors, where boards are expected to balance risk oversight and legitimacy, larger boards provide the structural flexibility to include women and independent directors simultaneously. The pooled results reinforce this pattern: across all listed firms, board expansion is consistently linked to improved diversity and independence. Thus, board size functions not merely as an administrative feature but as a strategic mechanism for strengthening governance inclusiveness and monitoring effectiveness.

Female board chair leadership also plays a powerful and consistent role. In financial institutions, firms led by female board chairs show higher levels of both gender diversity and independence. This suggests that female leadership at the apex reshapes board appointment norms and encourages the inclusion of both women and independent directors. In non-financial firms, female chair leadership is particularly influential in promoting gender diversity, indicating that where external regulatory pressures are weaker, leadership diversity becomes a critical internal catalyst for board inclusiveness. Furthermore, female chair leadership improves board independence in non-financial firms, showing that the governance impact of women's leadership extends beyond symbolic representation to strengthening oversight and board autonomy. These findings directly align with the study's objectives by demonstrating that gender-diverse leadership enhances both representational and monitoring dimensions of corporate governance.

Ownership structure presents a more complex picture. In the pooled sample, government ownership, foreign ownership, and dominant shareholding each undermine board gender diversity. This indicates that when ownership is concentrated, whether by the state, foreign investors, or large blockholders, diversity may not be prioritised in director selection. In such cases, controlling owners may appoint directors based on loyalty, alignment, or political networks rather than representational balance. The negative effect of government ownership on diversity is especially evident in financial institutions, where state-linked firms may rely on politically connected appointments, thereby limiting opportunities for women's inclusion. In non-financial firms, both government and foreign ownership similarly reduce gender diversity, suggesting that inclusion in less-regulated sectors is strongly shaped by who holds control rights rather than by firm size or performance.

By contrast, ownership effects on board independence reveal a different logic. In the pooled estimation, government ownership, foreign ownership, and substantial shareholding all promote board independence, while firm size undermines it. This implies that controlling owners may support the appointment of independent directors as a credibility mechanism to enhance monitoring, compliance, or legitimacy. Foreign investors and government stakeholders may have incentives to strengthen independence to reduce agency risks and demonstrate governance integrity to regulators and markets. However, the simultaneous negative effects of ownership on gender diversity show that owners may support monitoring-enhancing governance reforms while resisting representational change. In other words, independence and diversity do not always move together; they are shaped by different strategic priorities.

Sectoral differences further clarify this tension. In financial institutions, government and foreign ownership increase board independence, yet substantial shareholding reduces it. This suggests that dominant private shareholders in finance may prefer boards that align with blockholder interests rather than independent oversight. In non-financial firms, substantial shareholding instead enhances board independence, reflecting that dominant owners in these sectors may value independent directors to constrain managerial discretion. These contrasts underscore the importance of the study's sector-sensitive approach: identical ownership structures can produce different governance outcomes depending on regulatory intensity, risk exposure, and institutional pressures.

Firm size consistently deters board independence across both sectors and the pooled sample. Larger firms may experience greater managerial entrenchment or complexity that reduces the board's effective autonomy. This finding supports the research problem by indicating that organisational scale can weaken substantive independence even when formal structures are present. Profitability, meanwhile, plays a limited role. It does not significantly affect diversity or independence within sectoral models, but in the pooled sample, it supports board independence. This suggests that while firm performance alone does not drive governance change, more profitable firms may have resources or incentives to strengthen board monitoring and legitimacy.

The pooled findings also show that being a financial institution promotes board gender diversity and supports board independence. This indicates that sectoral governance regimes matter. Financial firms operate under stronger regulatory and reputational pressures, encouraging more visible inclusion and more professionalised board structures. Hence, sector type is not merely a control factor but an institutional environment that shapes how internal board attributes and ownership influences translate into governance outcomes.

Taken together, the results advance the underlying objectives of this study in three ways. First, internal board design, particularly board size and female board chair leadership, plays a decisive role in strengthening both gender inclusion and monitoring independence. These factors offer practical levers for improving governance outcomes even in constrained institutional environments. Second, ownership structures exert dual effects: while they can enhance board independence, they may simultaneously restrict gender diversity, highlighting a structural disconnect between monitoring reforms and inclusion reforms. Third, sectoral context significantly moderates these relationships, with financial institutions showing stronger alignment with institutional governance expectations, while non-financial firms remain more vulnerable to ownership-driven appointment biases.

Therefore, the study demonstrates that governance inclusiveness and independence are not automatic complements in Ghana's listed firms. Board expansion and female leadership foster both outcomes, but concentrated ownership, especially government and foreign control, may privilege independence over diversity. These insights contribute to understanding corporate governance in emerging markets by showing that leadership diversity can serve as a mechanism

for reform, and that the pathways to independence and gender diversity are shaped by distinct institutional and ownership incentives.

CONCLUSION

This study examined how board structure and ownership configurations influence board gender diversity and board independence among listed firms in Ghana, with a particular focus on sectoral heterogeneity between financial and non-financial institutions. The results demonstrate that internal board characteristics, especially board size and female board chair leadership, are the most consistent and influential drivers of governance quality. Larger boards provide structural space for both diversity and independence, while female leadership at the chair level enhances inclusive governance and strengthens the board's monitoring function.

In contrast, ownership structures exhibit mixed and sometimes opposing effects. Government and foreign ownership generally undermine board gender diversity but promote board independence, suggesting that controlling shareholders prioritise oversight and legitimacy over representational inclusiveness. This divergence highlights a central governance paradox: firms may adopt formal monitoring mechanisms without necessarily embracing gender-balanced leadership. The analysis further shows that firm size tends to reduce board independence, while profitability plays a limited role, indicating that governance reforms are driven more by institutional and structural dynamics than by firm performance alone.

Overall, the study concludes that achieving both inclusive and independent boards in Ghana's listed firms depends primarily on how boards are architected and led, rather than on who owns the firm. Female board chair leadership emerges as a powerful mechanism for promoting both diversity and independence, reinforcing the strategic importance of leadership diversity in strengthening corporate governance systems in emerging markets.

IMPLICATIONS

Theoretical Implications

The findings of this study make several contributions to the theoretical frameworks underpinning corporate governance research, particularly Agency Theory, Stakeholder Theory, and Resource Dependence Theory, which guided the conceptual orientation of the study. First, the strong positive influence of board size on both board gender diversity and board independence supports Resource Dependence Theory, which posits that larger boards enhance

firms' access to diverse skills, knowledge, and networks that improve governance capacity. In line with this theory, larger boards in Ghanaian listed firms appear better positioned to incorporate women and independent directors, thus strengthening representational legitimacy and monitoring effectiveness simultaneously. This also aligns with Agency Theory, as board expansion enhances oversight and reduces managerial dominance.

Second, the consistent governance-enhancing role of female board chair leadership extends both Stakeholder Theory and Agency Theory. Stakeholder Theory suggests that diverse leadership reflects broader societal interests and improves the firm's responsiveness to multiple stakeholder groups. The results indicate that female chair leadership not only improves gender representation but also strengthens board independence, suggesting that leadership diversity can reshape governance norms and monitoring dynamics. This supports the view that women leaders contribute both symbolic and functional value to corporate boards in emerging markets.

Third, the contrasting effects of ownership structures, where government and foreign ownership undermine gender diversity but promote board independence, refine Agency Theory's assumptions. While the theory predicts that concentrated owners enhance monitoring through independent boards, the results show that such owners may simultaneously restrict gender inclusion, thereby decoupling the monitoring and representational roles of the board. This provides new evidence that independence and diversity respond to different ownership incentives and institutional pressures, particularly in the Ghanaian context.

Finally, the sectoral evidence that financial institutions display stronger alignment between diversity and independence outcomes reinforces Institutional Theory, which explains how regulatory and legitimacy pressures shape governance practices. The results imply that firms operating in highly regulated environments adopt more inclusive and independent board structures as a response to institutional expectations, while firms in less-regulated sectors remain more sensitive to ownership power dynamics.

Overall, the study advances governance theory by demonstrating that internal board design and leadership diversity are more powerful determinants of inclusive governance than ownership structure alone, and that the pathways to diversity and independence are governed by distinct theoretical mechanisms.

Managerial and Policy Implications

From a managerial perspective, the results indicate that firms seeking to improve governance outcomes should prioritise board expansion and leadership diversity. Increasing board size enhances both gender diversity and independence, suggesting that organisations can strategically design their boards to balance competence, representation, and monitoring capacity. Moreover, appointing women to the role of board chair strengthens both inclusion and independence, highlighting the value of gender-balanced leadership for long-term governance effectiveness.

For investors and policymakers, the findings underscore the need to go beyond formal independence requirements and explicitly promote gender diversity within board appointment frameworks. While ownership concentration tends to enhance independence, it may simultaneously constrain diversity. Therefore, regulators such as the Ghana Securities and Exchange Commission and the Bank of Ghana should incorporate diversity-focused governance directives, particularly for state-owned and foreign-controlled firms.

Policy reforms that encourage transparent and merit-based board selection processes can help reduce the dominance of political or ownership-driven appointments and foster more balanced and effective boards. In doing so, the study supports broader national and global objectives on gender equity and inclusive leadership in corporate governance.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This study, though insightful, is not without limitations that open pathways for further inquiry. First, the focus on GSE-listed firms limits the broader applicability of the findings, particularly to privately held firms or firms operating in other emerging economies. Future research may extend this analysis to non-listed or cross-country African samples to strengthen comparative governance insights. Second, the use of quantitative secondary data constrains understanding of the internal dynamics and behavioural processes that shape board appointments and leadership influence. Subsequent studies could adopt qualitative or mixed-method approaches, including interviews with directors and nomination committees, to deepen institutional and contextual interpretations. Third, while the study identifies how ownership and board structure affect diversity and independence, it does not examine how governance outcomes translate into firm performance or risk stability. Future research should, therefore, explore the mediating or moderating role of board diversity and independence in influencing financial, social, or

sustainability performance. Finally, additional longitudinal studies are needed to track how board leadership and governance practices evolve as gender inclusion policies and institutional standards continue to develop across emerging markets.

Data Availability Statement: The data supporting this study are publicly available from the GSE website. Additional data may be obtained from the author upon request.

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