Board Characteristics and Market Valuation of Listed Construction and Real Estate Firms in Nigeria

Nnedu, Stanley Chinonso; Iroh, Cosmas Emeziem; Nnamdi Ugochukwu Otiko
Department of Accounting,
Veritas University, Abuja, Nigeria
Corresponding author: Stanley Chinonso
Nnedu | Email: nnedus@veritas.edu.ng
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Abstract
Board structure is often used as a visible sign of governance quality, but that does not necessarily mean that changes in board composition are quickly reflected in market value. This study examines whether board size, a board-independence proxy, CEO duality and female board representation are associated with a simplified Tobin's Q proxy among six listed construction and real estate firms in Nigeria between 2020 and 2024. The data form an unbalanced panel of 29 firm-year observations, with Ronchess Global Resources Plc joining the sample after its listing in 2021. Each board characteristic is estimated in a separate two-way fixed-effects model, alongside controls for audited firm size, return on assets and leverage. Since the analysis contains only six firm clusters, conventional clustered standard errors are supplemented with HC3 estimates and exact restricted Rademacher wild-cluster bootstrap tests. Holm adjustment is also applied across the four governance hypotheses. None of the board variables is statistically significant under the exact bootstrap tests. Female board representation has the largest coefficient in absolute terms ($\beta = -0.0108$). Its conventional clustered p-value is .048, but the exact p-value rises to .094 and the Holm-adjusted value to .375. The four board variables are also jointly insignificant (exact $p = .719$). Taken together, the results suggest that differences in board structure across firms should not be treated as evidence that short-run changes in formal board composition automatically lead to changes in market valuation.

Keywords: *corporate governance; board characteristics; market valuation; Tobin's Q; Nigeria*

Introduction

Board structure is one of the first things investors and regulators can observe about a firm's governance. Companies add or remove directors, change the balance between executive and non-executive members, separate or combine the roles of chair and chief executive, and sometimes increase female representation. What is less obvious is whether these changes are followed by a comparable movement in market value. That question is especially important in construction and real estate, where valuation also depends on project cycles, financing conditions, asset quality, regulatory approvals, property-market conditions and wider macroeconomic developments. Comparing one firm with another can therefore be misleading. A company with a different board may also differ in many other, more persistent ways. The issue examined here is narrower: when board structure changes within the same firm, does market valuation change as well after those persistent firm differences and common annual shocks are taken into account?

There are good theoretical reasons to expect boards to matter, although the expected direction is not always clear. Agency theory focuses on the board's monitoring role. An effective board can restrain managerial opportunism, reduce information asymmetry and protect shareholders when ownership and control are separated (Fama & Jensen, 1983; Jensen & Meckling, 1976). Resource dependence theory looks at a different side of the board, namely the expertise, legitimacy, financing access and external relationships that directors can bring to the firm (Hillman & Dalziel, 2003; Pfeffer & Salancik, 1978). These two perspectives do not always point in the same direction. A larger board, for instance, may bring wider experience while making coordination more difficult. More non-executive directors may strengthen oversight, but their formal status does not by itself guarantee independence. CEO duality may concentrate power, yet it can also simplify leadership. In the same way, a more gender-diverse board may broaden perspectives without necessarily producing an immediate valuation response. Empirical studies reflect this lack of a single clear expectation. Yermack (1996) and Guest (2009) link smaller boards with higher firm value, while Coles et al. (2008) show that larger boards may be useful in more complex organisations. Bhagat and Black (2002) find no consistent long-run performance benefit from greater board independence. Findings on female representation are equally mixed. Carter et al. (2003) report a positive association with Tobin's Q, whereas Adams and Ferreira (2009) show that the effect depends partly on the wider governance environment. Recent evidence has not settled the issue. Bui et al. (2024) report a positive governance-value relationship in Vietnam, Bagh et al. (2025) find value-enhancing effects in a large US sample, and Bukari et al. (2024) report positive relationships for several board characteristics in Sub-Saharan African manufacturing firms. In contrast, Bunyaminu et al. (2025) document negative market-value effects for a number of board attributes in Ghana. The Nigerian evidence is just as mixed. Sanda et al. (2010) associate smaller boards and separated leadership roles with stronger firm outcomes, while Shaba and Yaaba (2024) report higher Tobin's Q among firms with smaller and more independent boards. Sinebe (2024) reaches a different conclusion, finding no significant effect for board size or board independence but a positive effect for gender diversity. Other Nigerian studies also report results that change with the sector, performance measure, board characteristic and model specification (Bala et al., 2024; Isola et al., 2020; Ogunsola & Awe, 2023; Peters & Fred-Horsfall, 2024). Akinsola et al. (2025), for example, find positive valuation effects for several governance attributes in the financial sector. Evidence for construction and real estate is much thinner. Wokeh (2022) reports insignificant relationships between board size, board independence and net profit margin. The lack of consistency suggests that sectoral context and empirical design matter as much as the governance variable being tested. One reason for these mixed results is methodological. Pooled governance-value regressions combine differences between firms with changes that occur within the same firm over time. A firm may be consistently larger, more profitable, better financed, more visible to investors or organised around a different business model, and those same persistent characteristics may also be associated with its board structure. In that setting, a positive pooled relationship can appear even when a change in the board itself has little short-run effect on valuation. A similar problem arises when profitability or leverage is omitted, because movements in market value may then be attributed to governance when they are actually related to operating performance or financing risk. Recent Nigerian studies of firm value show why these controls cannot be ignored (Bala et al., 2024; Njoku & Lee, 2025).

The present study deals with this problem by concentrating on variation within firms. Board size, the proxy for board independence, CEO duality and female board representation are examined separately rather than combined into a single governance score. This is important because the four variables do not represent the same governance mechanism and theory does not predict that they should move firm value in the same direction. Audited firm size, return

on assets (ROA) and leverage are included as time-varying controls. Firm fixed effects account for stable company-specific characteristics, while year fixed effects capture shocks shared by the firms in a given year. Firm age is not included in the two-way fixed-effects model because it becomes mechanically collinear once both firm and year effects are introduced. The paper contributes in three ways. It adds recent evidence from a relatively small but distinctive part of the Nigerian market, where operating companies and real estate investment trusts appear in the same sector. More importantly, it separates changes within firms from persistent differences between firms, which makes it harder to mistake a simple cross-firm correlation for evidence of value creation. Finally, the analysis takes the small number of firms seriously. With only six clusters, standard large-sample inference can be misleading, so the paper also reports HC3 estimates, exact restricted wild-cluster tests and Holm-adjusted p-values. The central question is therefore quite specific: once firm fundamentals, persistent company characteristics, common annual shocks and the small-cluster problem are accounted for, do changes in observable board structure help explain short-run movements in market valuation?

Literature Review and Hypothesis Development

Theoretical Framework

Agency theory starts from the familiar problem created by the separation of ownership and control. Managers usually have more information about the firm than shareholders and may not always act in ways that fully align with owners' interests. Boards are expected to reduce that problem by monitoring executives, approving major decisions and limiting actions that can transfer value away from shareholders (Fama & Jensen, 1983; Jensen & Meckling, 1976). From this perspective, stronger outside oversight and a clearer separation of leadership roles can improve monitoring. Very large boards, however, may make collective action more difficult and encourage free-riding (Jensen, 1993). These concerns are also reflected in the Nigerian Code of Corporate Governance, which gives considerable attention to board composition, independence and leadership structure (Financial Reporting Council of Nigeria, 2018). Resource dependence theory offers a different, but complementary, view. Directors are not only monitors; they can also bring expertise, legitimacy, regulatory knowledge, access to finance and useful external relationships (Hillman & Dalziel, 2003; Pfeffer & Salancik, 1978). Those resources may be especially valuable in construction and real estate because projects are capital intensive and often depend on financing arrangements, approvals and relationships with several stakeholders. Taken together, the two theories make it difficult to assume that any one board characteristic is universally good or bad. The same feature can create benefits in one setting and costs in another, which is why the board variables are considered separately in this study.

Board Size and Market Valuation

Board size is the most direct measure of how many people are available to perform the board's monitoring, advisory and resource-provision roles. Agency theory suggests that the benefits of adding directors may eventually be offset by slower communication, weaker individual accountability and greater scope for coalition building or free-riding (Jensen, 1993). This view is consistent with the inverse board-size relationships reported by Yermack (1996) and Guest (2009). Resource dependence theory, however, points to a different possibility. Firms with complex operations may need a wider range of expertise, contacts and experience at board level. Coles et al. (2008) provide evidence that larger boards can be useful in such firms. Studies from Nigeria do not resolve the debate. Shaba and Yaaba (2024) report result that favour smaller boards, whereas Sinebe (2024) finds no significant relationship between board size and Tobin's Q. Wokeh (2022) also reports an insignificant

relationship with net profit margin among construction and real estate firms. Bala et al. (2024) show that the relevance of board size changes with the performance measure and interaction being considered. Given these competing arguments, there is no strong basis for imposing a positive or negative sign in advance. The hypothesis is therefore stated in non-directional form.

H_1: Board size is significantly associated with the market value of listed construction and real estate firms in Nigeria.

Board Independence and Market Valuation

Board independence is measured in this study as the proportion of non-executive directors on the board. The measure is best understood as a proxy for outside representation; it does not imply that every non-executive director satisfies the stricter regulatory definition of an independent non-executive director. Even so, the agency argument is straightforward. Directors who are not involved in daily management should, in principle, be better placed to question executives, protect shareholders and strengthen the credibility of major decisions (Fama & Jensen, 1983). The difficulty is that formal status does not always translate into genuine independence. A non-executive director may lack detailed firm information or may have professional, social or ownership ties that weaken the ability to challenge management effectively (Bhagat & Black, 2002). The empirical evidence again points in different directions. Shaba and Yaaba (2024) report a positive relationship with firm value, while Sinebe (2024) finds no significant market-valuation effect. In construction and real estate, Wokeh (2022) reports a negative but insignificant coefficient. Evidence from elsewhere in Sub-Saharan Africa is also mixed: Bukari et al. (2024) find a positive association, whereas Bunyaminu et al. (2025) report negative effects for some outside-board characteristics in Ghana. Agency theory still provides a basis for expecting a positive relationship, but the evidence suggests that having more outsiders on a board is not necessarily the same thing as having stronger independent oversight.

H_2: The board-independence proxy is positively associated with the market value of listed construction and real estate firms in Nigeria.

CEO Duality and Market Valuation

CEO duality exists when the chief executive also serves as board chair. From an agency perspective, that arrangement can weaken oversight because the executive being monitored also has greater influence over the board's agenda and information flow (Jensen & Meckling, 1976). Separating the roles is therefore commonly viewed as a way of strengthening checks and balances, and leadership structure is an important part of the Nigerian governance framework (Financial Reporting Council of Nigeria, 2018). There is, however, another side to the argument. A single leader may provide clearer authority and faster strategic coordination. Finkelstein and D'Aveni (1994) describe this tension well, treating duality as a double-edged arrangement rather than an automatically weak governance structure.

Empirical findings depend heavily on context. Sanda et al. (2010) report evidence that is broadly consistent with separating the two roles, while other Nigerian studies show that board effects can change with the valuation measure and the model being estimated (Bala et al., 2024). The agency concern remains the basis for the hypothesis in this paper: when leadership is concentrated, managerial entrenchment may increase and board challenge may weaken. A negative relationship is therefore expected, although the actual sign may differ across firms and circumstances.

H_3: CEO duality is negatively associated with the market value of listed construction and real estate firms in Nigeria.

Female Board Representation and Market Valuation

Female representation on boards may matter for several reasons. A more diverse board can bring different professional experiences, perspectives, networks and approaches to monitoring and stakeholder issues. Resource dependence theory suggests that this wider range of backgrounds can expand the information and external resources available to the firm. Carter et al. (2003) report a positive relationship between board diversity and Tobin's Q, while Huang (2024) finds recent international evidence linking higher female representation with firm value. Bukari et al. (2024) also report a positive relationship among manufacturing firms in Sub-Saharan Africa. Still, the relationship is far from uniform. Adams and Ferreira (2009) show that the effect of diversity depends on the wider governance setting in which the board operates. Bunyaminu et al. (2025) report negative market-value effects for several board characteristics in Ghana, while Peters and Fred-Horsfall (2024) find a negative but insignificant relationship between board gender diversity and market value in Nigeria and Kenya. Isola et al. (2020) further suggest that female participation may matter through its interaction with other organisational resources rather than through a simple direct effect. On theoretical grounds, a positive association remains plausible, but the available evidence also leaves room for a weak or negative estimate.

H_4: Female board representation is positively associated with the market value of listed construction and real estate firms in Nigeria.

Empirical Synthesis and Research Positioning

The literature does not point to a universal governance premium. Instead, the effect of board structure appears to depend on the institutional setting, the type of firm, the governance variable and the way firm value is measured. Positive relationships have been reported in Vietnam, the United States and parts of Sub-Saharan Africa (Bagh et al., 2025; Bui et al., 2024; Bukari et al., 2024). Nigerian studies, however, contain positive, negative and insignificant results across different sectors and models (Akinsola et al., 2025; Bala et al., 2024; Ogunsola & Awe, 2023; Shaba & Yaaba, 2024; Sinebe, 2024). This variation matters. What appears to be a governance effect may sometimes reflect deeper and more persistent characteristics of the firms being compared. This reading of the evidence shapes the empirical strategy used here. The four board variables are not compressed into one index because they represent different mechanisms and do not carry the same theoretical prediction. The models also control for changing firm fundamentals and common annual shocks before any movement in Tobin's Q is attributed to governance. Firm size captures differences in scale and financing capacity, although empirical results can depend on how size is measured (Dang et al., 2018). ROA captures current profitability, while leverage reflects financing risk and balance-sheet structure. Each governance variable is therefore examined in the same two-way fixed-effects setting, where the emphasis is on changes within firms rather than on pooled correlations across firms.

Methodology

Research Design and Data

The study adopts an ex post facto panel design covering six firms in the Nigerian Exchange Construction/Real Estate sector, Julius Berger, Ronchess, SFS REIT, UH REIT, UPDC Plc and UPDC REIT, over 2020–2024. Firms were retained where the listed-period records provided sufficient governance disclosures, market information and audited financial data to construct the variables required for the analysis. Five firms contribute observations for 2020–2024, while Ronchess enters the panel in 2021 following its listing on 17 December 2021 (NGX Regulation Limited, 2021). The resulting unbalanced panel contains 29 firm-year observations. Data were obtained from audited annual reports, corporate-governance

disclosures, market information and NGX filings.

Variable Measurement

Firm value is measured with a simplified Tobin's Q proxy, calculated as market capitalisation plus total debt, divided by total assets. The measure follows the broader market-value-to-assets approximation used in the Tobin's Q literature, while it is not presented as the exact debt construction proposed by Chung and Pruitt (1994). Table 1 summarises the definitions and measurement of all study variables.

Table 1. Variable definitions and measurement

Variable	Symbol	Measurement	Role
Firm value (simplified Tobin's Q)	TQ	(Market capitalisation + total debt) / total assets	Dependent variable
Board size	BS	Total directors at financial year-end	Focal governance variable
Board independence proxy	BI	Non-executive directors / total directors	Focal governance variable
CEO duality	CD	1 if CEO and board chair are the same person; 0 otherwise	Focal governance variable
Female board representation	GD	Female directors / total directors × 100	Focal governance variable
Audited firm size	SIZE	ln(total assets in Naira millions)	Control
Return on assets	ROA	Post-tax profit or REIT net-income equivalent / closing total assets × 100	Control
Balance-sheet leverage	LEV	Total liabilities / total assets × 100	Control

Note. ROA uses closing total assets for cross-firm consistency. For REITs, the audited net-income/post-tax earnings equivalent is used consistently within each entity.

Model Specification and Estimation

To avoid over-parameterising the small panel, each board characteristic is estimated separately with the same financial controls and firm and year fixed effects. Firm age is omitted because it is collinear with the two-way fixed effects (Baltagi, 2021; Wooldridge, 2010). For k ∈ {BS, BI, CD, GD}, the model is specified as:

$$TQ_{it} = \alpha_i + \lambda_t + \beta_k BOARD_{k,it} + \gamma_1 SIZE_{it} + \gamma_2 ROA_{it} + \gamma_3 LEV_{it} + \varepsilon_{it} \quad (1)$$

where TQ is the simplified Tobin's Q proxy for firm value; BOARD denotes the focal board characteristic; SIZE, ROA and LEV are the control variables; α_i and λ_t capture firm and year effects, respectively; and ε_{it} is the error term.

The models are estimated by OLS with firm and year fixed effects and firm-clustered standard errors. Given only six firm clusters, exact restricted Rademacher wild-cluster-

bootstrap tests provide the primary inference, with HC3 estimates as a sensitivity check (Cameron & Miller, 2015; MacKinnon et al., 2023). Holm's (1979) adjustment is applied across the four governance hypotheses. Robustness checks include a joint model, winsorised ROA and leave-one-firm-out estimates. Estimation was performed in Python using statsmodels 0.14.6.

Results

Descriptive Statistics and Preliminary Analysis

Table 2 describes the 29 firm-year observations. The simplified Tobin's Q proxy averages 1.025, with a median of 0.941 and values between 0.646 and 1.668. Boards contain roughly ten directors on average. Non-executive directors make up 51.6% of board membership, CEO duality appears in 48.3% of the observations, and women account for an average of 21.2% of directors. Firm size varies considerably, which is not surprising given that the sample brings together large operating companies and smaller REITs.

ROA shows the widest spread among the financial controls. Its average is 1.01%, but the values range from -70.35% to 26.12%. The large negative observation was checked against the audited source data and is not a spreadsheet error. Leverage averages 33.62% of total assets and ranges from 2.03% to 86.49%, showing substantial differences in financing structure across the firms. Since one extreme profitability observation can have a noticeable influence in a small sample, the robustness checks also re-estimate the models after winsorising ROA.

Table 2. Descriptive statistics

Variable	Mean	Median	Std. dev.	Minimum	Maximum
TQ	1.025	0.941	0.284	0.646	1.668
BS	9.586	10.000	1.637	7.000	12.000
BI	0.516	0.530	0.062	0.400	0.600
CD	0.483	0.000	0.509	0.000	1.000
GD	21.232	21.220	6.444	10.700	34.370
SIZE	10.062	9.883	1.585	7.950	13.703
ROA	1.009	3.461	16.343	-70.355	26.123
LEV	33.619	19.932	29.215	2.032	86.488

Note. n = 29 listed-firm observations. SIZE = natural logarithm of audited total assets in Naira millions; ROA and LEV are percentages.

Table 3 presents the pooled Pearson correlations and centred variance inflation factors. Tobin's Q has its strongest simple correlation with audited firm size (r = .757), followed by leverage (r = .449), board size (r = .372) and the proxy for board independence (r = .317). These figures are descriptive. Because they combine variation within firms and differences between firms, they should not be read as causal relationships. The highest VIF is 2.89 for leverage, while the remaining predictor VIFs are also below 3. On this basis, there is no evidence of severe multicollinearity among the observed regressors before the fixed-effect indicators are added.

Table 3. Pooled correlations and variance inflation factors

Var.	TQ	BS	BI	CD	GD	SIZE	ROA	LEV	VIF
TQ	1.000								—
BS	0.372	1.000							2.66
BI	0.317	0.174	1.000						1.45
CD	0.173	-0.009	-0.279	1.000					1.20
GD	0.166	-0.100	-0.302	0.148	1.000				1.29
SIZE	0.757	0.649	0.291	0.024	0.125	1.000			2.38
ROA	0.150	-0.089	0.042	-0.020	-0.115	0.019	1.000		1.07
LEV	0.449	0.736	0.301	0.130	-0.086	0.661	-0.121	1.000	2.89

Note. Pairwise Pearson correlations are shown on and below the diagonal. VIFs are calculated for the seven observed predictors before fixed-effect indicators are added.

Two-Way Fixed-Effects Results

The four main fixed-effects estimates are reported in Table 4. For board size, the coefficient is small and very imprecise (β = 0.0038; cluster 95% CI [-0.1159, 0.1234]; exact wild p = .906), so H1 is not supported. The coefficient on the board-independence proxy is positive (β = 0.3784), but the confidence interval is wide and the exact p-value is .531; there is therefore no support for H2. CEO duality is also positive rather than negative (β = 0.0465), although the estimate remains weak and imprecise (cluster 95% CI [-0.1308, 0.2238]; exact wild p = .469). H3 is consequently not supported. Female board representation produces the clearest signal in the table, but it is not robust to the small-cluster test. The coefficient is negative (β = -0.0108), and the conventional firm-clustered result gives a 95% confidence interval of [-0.0216, -0.0001] with p = .048. That result looks statistically significant at the usual 5% level. Once the six-cluster structure is handled with the exact wild bootstrap, however, the p-value increases to .094; after Holm adjustment it rises further to .375. The estimate also runs in the opposite direction to H4. On the primary inferential criterion, H4 is therefore not supported. This difference between the conventional and exact tests is important because it illustrates how fragile statistical significance can be when the number of clusters is very small.

The coefficients on firm size, ROA and leverage are not statistically significant in any of the four primary models. They are nevertheless retained because the purpose of the controls is not limited to producing significant coefficients. They help account for changes in financial conditions that might otherwise be mistaken for an effect of changing board structure.

Table 4. Primary two-way fixed-effects estimates

Statistic	Model 1: BS	Model 2: BI	Model 3: CD	Model 4: GD
Focal board coefficient	0.0038	0.3784	0.0465	-0.0108
Firm-clustered SE	0.0465	0.6343	0.0690	0.0042
Cluster 95% CI	[-0.1159, 0.1234]	[-1.2522, 2.0090]	[-0.1308, 0.2238]	[-0.0216, -0.0001]
Cluster p	.939	.577	.530	.048

Statistic	Model 1: BS	Model 2: BI	Model 3: CD	Model 4: GD
Exact wild p	.906	.531	.469	.094
Holm-adjusted wild p	1.000	1.000	1.000	.375
SIZE coefficient	0.0181	0.0619	-0.0158	0.1926
ROA coefficient	0.0009	0.0006	0.0013	-0.0013
LEV coefficient	0.0002	0.0012	-0.0005	0.0030
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R^2 (including FE)	0.891	0.894	0.894	0.924
Adjusted R^2	0.796	0.802	0.802	0.858
Incremental within R^2	0.024	0.051	0.054	0.322
Observations / firms	29 / 6	29 / 6	29 / 6	29 / 6

Note. Dependent variable: simplified Tobin's Q proxy. Each model includes one focal board attribute plus SIZE, ROA, LEV, firm fixed effects, and year fixed effects. Exact wild-bootstrap p-values enumerate all 64 Rademacher cluster sign patterns. Holm adjustment is applied across the four focal governance hypotheses.

Robustness and Sensitivity Analysis

Table 5 summarises the main hypothesis decisions and the sensitivity checks. When all four board variables and the three financial controls are entered together, the governance variables are jointly insignificant under the conventional firm-clustered test ($F = 1.787$, $p = .269$) and under the exact wild-cluster joint test ($p = .719$). The exact coefficient tests in the joint model also provide no evidence of a robust governance relationship, and the HC3 results leave all four board coefficients statistically insignificant. The broad conclusion is therefore not simply a consequence of estimating the board characteristics one at a time.

Changing the treatment of the profitability outlier does not materially alter the findings. After ROA is winsorised at the 5th and 95th percentiles, the exact p-values are .938 for board size, .438 for the board-independence proxy, .500 for CEO duality and .063 for female board representation. The coefficient on female representation is also negative in every leave-one-firm-out regression, ranging from about -0.0137 to -0.0074. Its exact p-values, however, range from .063 to .250. The negative sign is fairly persistent, but the strength of the evidence depends on which firms remain in the sample. For that reason, the result is better treated as suggestive than as a robust finding. Firm and year effects are kept in the models because the research question concerns changes within firms, not simply average differences across them. In the joint model, both sets of effects are jointly important under the conventional clustered tests. This also explains why the high overall R^2 values in Table 4 should be interpreted carefully. Much of the model fit comes from the firm and year intercepts rather than from the governance variables themselves. The incremental within variation associated with the focal governance variable and the financial controls ranges from about 2.4% in the board-size model to 32.2% in the female-representation model. Even so, the governance coefficients remain too imprecise to support the hypotheses under the exact small-cluster tests.

Table 5. Robustness tests and hypothesis decisions

Test / hypothesis	Result	Inference
H_1: Board size	β = 0.0038; exact p = .906; Holm p = 1.000	Not supported
H_2: Board-independence proxy	β = 0.3784; exact p = .531; Holm p = 1.000	Not supported
H_3: CEO duality	β = 0.0465; exact p = .469; Holm p = 1.000	Not supported
H_4: Female representation	β = -0.0108; exact p = .094; Holm p = .375	Not supported
All four board attributes jointly	Cluster F = 1.787, p = .269; exact joint p = .719	Joint null not rejected
HC_3 sensitivity	All four board coefficients remain statistically insignificant	Primary conclusion unchanged
ROA winsorised at 5th/95th percentiles	Exact p: BS .938; BI .438; CD .500; GD .063	Primary conclusion unchanged
Leave-one-firm-out gender models	GD coefficient remains negative (approximately -0.0137 to -0.0074); exact p = .063-.250	Suggestive, not robust

Note. Exact p-values are from restricted Rademacher wild-cluster-bootstrap tests with six firm clusters. Holm-adjusted p-values control the family-wise error rate across H1–H4.

Discussion

Board Size

The board-size result provides no reliable evidence that adding or removing directors is followed by a contemporaneous change in Tobin's Q once firm effects, year effects and the financial controls are taken into account. This differs from the negative valuation relationships reported by Yermack (1996), Guest (2009), and Shaba and Yaaba (2024), but it is closer to the insignificant findings of Sinebe (2024) and Wokeh (2022). The confidence interval is also wide and includes potentially meaningful effects in both directions. It would therefore be too strong to conclude that board size does not matter. What the data show is more limited: within this five-year panel of six firms, there is no stable short-run relationship that can be estimated with confidence. A likely reason is that simple headcount says little about how a board actually works. The expertise of individual directors, the effectiveness of committees, access to information, attendance and the quality of boardroom discussion may matter more than the number of seats around the table. Board size also changes infrequently, which leaves relatively little within-firm variation over a five-year period. In some companies, the extra expertise and connections that come with another director may offset the coordination problems emphasised by agency theory. If those forces differ from firm to firm, a common average effect may be difficult to detect.

Board Independence

The coefficient on the board-independence proxy is positive, but it is far too imprecise to support the expected monitoring premium. This contrasts with Shaba and Yaaba (2024) and Bukari et al. (2024), but is closer to the results of Bhagat and Black (2002), Sinebe (2024), and Wokeh (2022). An important qualification is that the variable measures the proportion of non-executive directors. It does not directly measure whether those directors are independent in the stronger substantive or regulatory sense. A board may therefore have a high proportion

of outsiders without necessarily providing stronger independent challenge.
Effective independence depends on much more than a director's formal title. Relevant sector experience, access to timely information, the authority of board committees, ownership concentration and relationships with controlling shareholders can all shape how freely a director can question management. These issues may be particularly important in capital-intensive firms and REITs. Since the present dataset does not capture those qualitative dimensions, the coefficient should be interpreted as evidence about non-executive representation rather than as a definitive test of genuine board independence.

CEO Duality

CEO duality carries a positive coefficient even though H3 expected a negative relationship. The estimate is weak, however, and its confidence interval covers both positive and negative values. The result therefore offers no support for H3, but neither does it show that combining the two roles creates value. Finkelstein and D'Aveni's (1994) description of duality as a double-edged arrangement is useful here. Concentrating leadership can create entrenchment problems, yet it can also produce clearer authority and faster coordination. The data do not show which of these mechanisms, if either, dominates among the sampled firms.
There is also a measurement issue. A binary duality variable records whether the CEO and chair positions are formally combined, but it says little about how power is actually distributed within the board. Committee structures, ownership concentration, founder influence, succession arrangements and the authority of other senior directors can all alter the practical effect of duality. A simple one-zero indicator may therefore miss much of the governance process that agency theory is concerned with.

Female Board Representation

Female board representation is the only governance variable that reaches the 5% level under conventional clustered inference. Even that result becomes uncertain once the exact six-cluster test and multiple-testing adjustment are applied. The coefficient is -0.0108, with a conventional p-value of .048, an exact p-value of .094 and a Holm-adjusted p-value of .375. The negative sign differs from the positive findings of Carter et al. (2003), Huang (2024), Bukari et al. (2024), and Sinebe (2024), but is closer to the insignificant negative result of Peters and Fred-Horsfall (2024) and some of the negative board-attribute estimates reported by Bunyaminu et al. (2025). The leave-one-firm-out analysis keeps the sign negative, although the statistical evidence changes noticeably as firms are removed.
This pattern should not be interpreted as evidence that appointing female directors reduces firm value. Board appointments are not random. They may follow earlier performance problems, governance reforms, succession changes or regulatory pressure. The effect of greater representation may also take time to appear, and small changes in board composition may be insufficient to alter board behaviour in the short run. Adams and Ferreira (2009) show that diversity outcomes depend on the wider governance setting, while Isola et al. (2020) find that female participation can matter through interaction with other organisational resources. The safer interpretation is that this sample does not provide robust evidence of an immediate positive valuation relationship; it does not establish a causal penalty from gender diversity.

Financial Controls, Firm Heterogeneity and Interpretation of Null Results

Audited firm size, ROA and leverage are not consistently significant in the short-run fixed-effects models. That finding does not necessarily conflict with studies such as Njoku and Lee (2025), which show that profitability and capital structure can matter for firm value. The questions being estimated are different. Here, the coefficients capture whether changes in these variables within the same firm over five years are associated with changes in Tobin's Q

after firm and year effects are removed. They do not measure whether larger, more profitable or differently financed firms tend to have higher average market values than other firms.
This distinction between within-firm and between-firm relationships is central to the paper. In the pooled data, Tobin's Q is positively correlated with several firm characteristics, especially audited size. Once persistent differences across firms and common year shocks are removed, the board coefficients become much weaker and less precise. That does not mean pooled relationships are uninformative, but it does mean they should not automatically be read as evidence of what will happen when a firm changes its governance structure. The small sample also produces wide confidence intervals, so the study cannot claim that the true effects are exactly zero. The more cautious conclusion is that the observed within-firm changes do not provide robust evidence of short-run valuation effects for the four formal board characteristics under the controls and inference procedures used here.

Conclusion and Implications

This paper examined the relationship between board characteristics and market valuation in six Nigerian listed construction and real estate firms over the period 2020-2024. The analysis used two-way fixed effects and considered board size, the board-independence proxy, CEO duality and female board representation separately rather than combining them into one governance index. Audited firm size, ROA and leverage were included as time-varying controls, while firm and year effects accounted for persistent company differences and shocks common to each year. Because the sample contains only six firm clusters, conventional inference was supplemented with HC3 estimates, exact restricted wild-cluster-bootstrap tests and Holm adjustment across the four governance hypotheses. The main result is that none of the four board characteristics has a statistically robust short-run relationship with the simplified Tobin's Q proxy when the exact small-cluster tests are used as the primary basis for inference. Female board representation produces the largest coefficient in absolute terms. Although its conventional clustered p-value is .048, the exact p-value is .094 and the Holm-adjusted p-value is .375. The four governance variables are also jointly insignificant in the saturated model (exact $p = .719$). These findings should not be read to mean that governance has no value. Rather, they suggest that year-to-year changes in formal board structure do not automatically translate into contemporaneous changes in market valuation once persistent firm differences, common annual shocks and financial fundamentals are taken into account. There are practical implications. For boards and managers, the results suggest that governance quality cannot be reduced to meeting numerical composition targets. The expertise of directors, the work of committees, information quality, ownership incentives, risk oversight and the credibility of strategic decisions may matter more than counts and percentages on their own. Investors should also be cautious about treating board structure as a stand-alone valuation signal; it makes more sense when read alongside the firm's financial condition and business model. For regulators, the findings do not argue against role separation, diversity or effective outside oversight. They do, however, suggest that formal compliance measures are more informative when they are accompanied by evidence about how boards actually operate. The study also has clear limitations. It covers only six firms and 29 firm-year observations, and the sample combines operating companies with REITs. This limits statistical power and the extent to which the results can be generalised. The panel is short and mildly unbalanced, the board variables change slowly, and reverse causality cannot be ruled out. Board independence is represented by the proportion of non-executive directors rather than by a direct regulatory classification of independent directors. The simplified Tobin's Q series comes from the compiled market-governance database, while ROA is based on closing total assets and includes one genuine extreme negative observation. The exact bootstrap tests, winsorisation and leave-one-firm-out checks help reduce the risk of drawing

conclusions from a fragile specification, but they cannot replace a larger and longer panel.
Future work could extend the analysis in several useful directions. A longer period and a larger number of firms would make it easier to separate operating companies from REITs and to test whether the present results hold across different types of entities. Tobin's Q could also be reconstructed directly from independently verified year-end market and balance-sheet components. Richer governance measures would be particularly valuable, including regulatory independence, ownership concentration, director expertise, committee activity and board meeting frequency. Lagged governance variables could help determine whether market responses take time to emerge. With a sufficiently large panel, dynamic panel methods or credible instrumental-variable strategies could also be used to address reverse causality more directly. These extensions would help show whether the weak short-run relationships found here reflect genuinely limited valuation effects or simply the difficulty of identifying slow-moving governance changes in a small sectoral sample.

Data Availability

The analysis uses a 29-observation panel of listed firms together with a source-reconciliation workbook covering total assets, post-tax profit or net income, and total liabilities. The workbook contains the relevant annual-report source links and notes on how the financial variables were measured. The analytical dataset and source-audit workbook can be made available as supplementary material for editorial or reviewer verification.

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Conflict of Interest

The authors declare no conflict of interest.

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