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Board Governance as a Moderator in the Relationship Between Firm Dynamics and Profitability of Listed Insurance Firms in Nigeria

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ABSTRACT

In this study, the moderating influence of board control is examined in the cause-effect relationship that exists between firm dynamics (firm size, growth, and leverage) and the profitability of listed insurance firms in Nigeria. In previous studies, the interaction between internal firm attributes and governance systems, especially in developing economies, has been widely overlooked, hence making the study a very important addition. Applying the positivist philosophy and a deductive method of research, the secondary data consisted of collected annual reports of the 14 listed insurance companies in the Nigerian Exchange Group in the previous year, 2015 to 2024. The proposed hypotheses were tested by applying multiple regression analysis with interaction terms that were applied in the framework of moderation by Baron and Kenny (1986). The findings show that the size of the firm has a negative implication on profitability, but firm growth and leverage have positive implications. Although the board control (measured in terms of the number of independent directors) was linked to a direct negative impact on the profitability, it strengthened the correlation between the firm size and profitability to a great extent. On the other hand, its moderating roles on firm growth and leverage were statistically non-significant. These results indicate that the role of governance structure, especially independent directors, can conditionally influence the influence of firm dynamics on financial performance. To this end, this study proposes that insurance companies should enhance their board independence and that the regulating bodies enhance governance changes in accordance with the firm-specific risks. The study contributes to the theory by broadening the body of literature on governance with the moderation-based framework and providing useful information on how to enhance the profitability of firms through strategic oversight of boards.

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INTRODUCTION

In recent years, the insurance industry in Nigeria has seen a major structural and regulatory transformation, and it is against this context that the analysis of the impact of the internal firm processes on financial performance has given rise to increased questioning of the role of the board governance within the firm. Boards of directors serve as critical institutions in strategic decision-making, risk management, and oversight, and the composition and dynamics may have extensive implications for the performance of firms. In the framework of the listed insurance companies in Nigeria, board governance is seen to have grown as a crucial moderating factor, contingent upon the presence of a particular pattern of board composition, such as the size of the board, the level of diversity, the presence of independence, and the frequency of the meetings (Ionaşcu, 2025).

Changes at the board level, including changes that appear due to the change of Chief Executive Officer, frequently reorganize the group composition in the boardroom, thus impacting the strategic direction and effectiveness in oversight (Adams and Kastrinaki, 2023). Not only may these transitions affect profitability, but also solvency, especially in dynamic market environments when companies need to adjust to changing regulatory, competitive, and technological changes (Adams and Kastrinaki, 2023). A poor turnover of boards can be the indication of stagnation and the inability to introduce new people with a new vision needed to operate in the world of alternative financial products and new forms of insurance (Palmieri et al., 2024). On the contrary, the strong board systems with diverse and independent boards are able to increase resource allocation, strategic oversight, and sustainable growth ability, thus leading to resource financial stability (Agha, 2023).

In the emerging markets like Nigeria, the special institutional conditions, confounded by a mix of the state and the personal sectors, require a delicate perception of governance effectiveness. The importance of board diversity, such as gender and expertise variation, is especially important because it may help to enrich decision-making processes, increase the quality of financial reporting, and increase the overall financial performance (Ghafoor et al., 2022; Ogechukwuka and Frank, 2023). Inside directors can bring the technical knowledge of the firms, which can be used to make informed operational decisions, while outside directors offer the independent oversight, which will ensure the efficient monitoring of the management and the optimal utilization of resources (Adams and Kastrinaki, 2023). Such relations have a direct impact on the transparency of corporations, disclosure, and the ability of the firm to have a strong balance sheet (Béji et al., 2020).

In spite of these theoretical connections, there are still mixed empirically derived findings on the direct influences of the board characteristics on the financial performance. Some reports have been found of affirmative effects of gender diversity on decision-making and profitability, but it has been found that there is an inconsistent relationship between the context and markets (Amadi et al., 2023; Tarda et al., 2024). This contradiction highlights the need to have context-specific studies, especially in the insurance industry in Nigeria, in order to determine how the governance institutions interact with the internal firm dynamics. This knowledge is critical to investors, regulators, and companies that aim to ensure a better-structured governance system in order to facilitate profitability and sustainability over the long term (Ogechukwuka and Frank, 2023).

Additionally, there are new changes in the board structures in Nigeria regarding the revised Code of Corporate Governance with transparency, accountability, and compliance with the best practice (Egbunike et al., 2023). It is especially relevant to the listed insurance companies working in the environment of both financial innovation and increased regulatory scrutiny to consider how these regulatory changes impact board effectiveness and, subsequently, the correlation between firm dynamics and profitability (Awwad et al., 2023; Herbert and Agwor, 2021).

It is in this light that it is important to have an insight into the moderating effects of the board governance. It allows an assessment of how the characteristics of independence, diversity, and frequency of meeting of the boards of directors mediate effects of firm-level factors, such as size, growth, and leverage, on the profitability. Through exploring the relationships, firms will have an idea of governance practices that will lead to better strategic oversight, superior financial reporting, and overall performance.

Empirical evidence confirm that strong board governance can improve profitability by fostering strategic alignment, operational efficiency and sound risk management. Firms with well-structured and independent boards will have a high profitability indicator such as ROA, ROE (Ahmed et al., 2020; Alabdullah et al., 2021). Moreover, good governance influences investor perceptions of risk management and corporate integrity, which has positive implications on valuation of firms and investor confidence in the market (Al Farooque et al., 2020). Regulators are equally stressing on the importance of board control in maintaining stability and protecting consumers and hence play a crucial role in strengthening the industry resilience (Assenga et al., 2018).

In this study the board governance is not conceived as an independent variable of the profitability but as a moderating variable. That is, the governance of boards potentially conditions or changes the strength of the relationship between firm dynamics (size, growth, leverage) and profitability. For example, while large firm size may have advantages of scale, poor governance may have disadvantages in the form of inefficiencies and agency problems that will reduce profitability. Similarly, growth can improve competitiveness but if there is poor board oversight of the firm, there can be dangerous chances of expansion. Leverage might raise the rate of return but too much debt with no governance checks might compromise financial sustainability.

The theoretical support for this moderating role is based on agency theory, stewardship theory, and resource dependency theory. Agency theory emphasizes the role of boards in mitigating conflicts of interests between managers and shareholders through effective monitoring (Uribe-Bohorquez et al, 2018). Stewardship theory posits that empowered managers with effective governance structures can be stewards of shareholder value. Resource dependency theory focuses on the role of boards in supplying critical resources, networks, and legitimacy in strengthening organizational performance (Uyar et al., 2021). Together, these perspectives illustrate the idea that board control does not only affect profitability directly, but also shapes the conditions under which firm-specific factors transform into performance.

While there are existing studies that have studied the direct impact of firm dynamics or corporate governance on performance, little empirical work has been done to study the interaction between the two, especially in the Nigerian insurance industry. Studies such as Abubakar et al. (2018) and Mbonu andAmahalu (2021) have examined firm characteristics, and profitability, whereas Alabdullah et al. (2021) and Ahmed et al. (2020) have examined board attributes, and financial performance. However, few have examined the moderating role that board control plays, leaving a

gap in knowledge about how governance mechanisms amplify or diminish the impact of firm dynamics on profitability in the insurance sector.

This research, therefore, is aimed at filling this gap in that it seeks to study the moderating role of the board governance in the relationship between firm dynamics and profitability of listed insurance companies in Nigeria. By blending theoretical perspectives with empirical evidence, the research aims to offer insights that bolster academic literature as well as practical governance strategies. For managers and boards, the results will point out how governance mechanisms can be used to strengthen firm-specific strengths and reduce risks. For regulators like National Pension commission (NAICOM) and the Nigerian Exchange Group (NGX), the results will help into policies to improve corporate governance standards and ensure financial resilience. Ultimately, this study presents a contribution to a greater understanding of the interaction of firm dynamics and board control in the development of profitability, and it provides guidance for sustainable growth and competitiveness in the Nigerian insurance sector.

This study explored the moderating role of board governance with regard to the relationship between the firm dynamics, which are the firm size, growth, and leverage, and the profitability of listed insurance companies in Nigeria, with special focus on the impact of the board composition, independence, and practice on the quality of reporting and financial performance.

METHOD

Research Philosophy

This study adopts a positivist research philosophy, which assumes that reality is objective and can be measured through observable and quantifiable data. Positivism aligns with the empirical orientation of this research, which seeks to examine the interrelationships between measurable variables specifically firm size, growth, leverage, and profitability using numerical evidence derived from corporate records. This philosophical approach supports rigorous hypothesis testing and the application of statistical methods to assess causal and moderating effects within the study context.

Research Design

An ex-post facto research design is employed, as the study analyzes historical data from audited financial statements without manipulating variables. This design is particularly suitable for examining relationships between firm dynamics (size, growth, and leverage), board control, and profitability. By utilizing panel data over a ten-year period (2015–2024), the design captures both time-series and cross-sectional variations, enhancing the robustness of statistical inferences. Ex-post facto design is commonly applied in corporate governance and financial performance research, allowing the investigation of cause-and-effect relationships where direct manipulation of variables is not feasible.

Study Population

The study population comprises 21 insurance companies listed on the Nigerian Exchange Group (NGX) as of December 31, 2024. These firms represent a comprehensive cross-section of the Nigerian insurance industry, exhibiting diverse characteristics, including firm size, market longevity, and operational scale (NGX Group, 2024). This diversity ensures that the study adequately captures variations in firm dynamics and governance practices.

Sample Size and Sampling Technique

Using purposive sampling, 14 companies were selected based on three criteria:

1. Consistent publication of audited annual reports in compliance with IFRS from 2015 to 2024.
2. Active trading status without delisting, suspension, or prolonged trading halts.
3. Continuous engagement in core insurance operations, without full diversification into unrelated sectors.

Companies not meeting these criteria Coronation Insurance Plc, Goldlink Insurance Plc, Staco Insurance Plc, Standard Alliance Insurance Plc, Sunu Assurances Nigeria Plc, Universal Insurance Plc, and Veritas Kapital Assurance Plc were excluded. Purposive sampling allows the selection of firms that are most relevant to the research objectives, ensuring reliable and generalizable findings (Al Farooque et al., 2020; Alabdullah et al., 2021).

Data Collection Sources and Methods

The study utilizes secondary data from annual reports and financial statements of the selected 14 firms spanning 2015–2024. Annual reports provide comprehensive financial and governance information, enabling assessment of profitability, firm dynamics, and board control practices.

Variables and Measurement

The dependent variable is profitability, measured by Return on Assets (ROA), reflecting overall efficiency in generating profits relative to total assets.

The independent variables are:

Firm Size (FSIZ): Natural logarithm of total assets, representing firm capacity and scale. Firm Growth (FGRO): Percentage increase in net income relative to total assets, capturing dynamic expansion. Firm Leverage (FLEV): Ratio of total debt to total assets, indicating financial risk and stability.

Control Variable: Firm Age (FAGE): Difference between the year of listing and the study period, accounting for organizational maturity.

Moderating Variable: Board Control (BCON): Proportion of independent directors to total directors, reflecting the board's oversight effectiveness. The study examines how board independence moderates the relationship between firm dynamics and profitability.

Descriptive Statistics

Measures including mean, median, standard deviation, minimum, and maximum were computed for ROA, FSIZ, FGRO, FLEV, FAGE, and BCON. Descriptive statistics provide insights into central tendencies, variability, and distribution patterns while identifying potential anomalies such as outliers or skewed data (Cohen, Manion, & Morrison, 2002).

Inferential Statistics

1. Correlation Analysis: Pearson correlation coefficients were estimated to determine the strength and direction of linear relationships among variables

and to identify potential multicollinearity prior to regression analysis (Cohen et al., 2002).

2. Regression Analysis: Panel data regression using Ordinary Least Squares (OLS) was employed to examine: a) The direct impact of firm dynamics on profitability; b) The direct effect of board control; c) The moderating effect of board control on the relationship between firm dynamics and profitability.

Both fixed effects and random effects models were estimated to account for unobserved heterogeneity. The Hausman test was applied to select the appropriate model.

Model of the Study

For this study, the Regression Model (RM) is formulated as follows to investigate the relationships among firm dynamics (FSIZ, FGRO, FLEV), board control (BCON), and profitability (ROA) in Nigerian insurance firms:

$ROA_{it}=\beta0+\beta1FSIZ_{it}+\beta2FGRO_{it}+\beta3FLEV_{it}+\beta4FAGE_{it}+\epsilon_{it}$ ……. Model I

$ROA_{it} = \beta0 + \beta1FSIZ_{it} + \beta2FGRO_{it} + \beta3FLEV_{it} + \beta4FAGE_{it} + \beta5BCON + \epsilon_{it}$ … …. Model II

$ROA_{it}= \beta0 + \beta1FSIZ_{it} + \beta2FGRO_{it} + \beta3FLEV_{it} + \beta4FAGE_{it} + \beta5BCON + \beta6(FSIZ\times BCON)_{it} + \beta7(FGRO\times BCON)_{it} + \beta8(FLEV\times BCON)_{it} + \beta9(FAGE\times BCON)_{it} + \epsilon_{it}$ ……. Model III

Where:

· ROA_{it} represents profitability measured by Return on Assets.

· $FSIZ_{it}$ is firm size measured by the natural logarithm of total assets.

· $FGRO_{it}$ denotes firm growth measured by the ratio of net income growth to total assets.

· $FLEV_{it}$ signifies Firm Leverage measured by the ratio of total debt to total assets.

· FAGE *It* is the firm age, the difference in the year of listing from the periods of the study.

· $BCON_{it}$ stands for Board Control, represented by the proportion of independent directors to total directors.

· β_0 is the constant.

· $\beta1 - \beta9$ are the coefficients.

· ϵ denotes the error term.

According to Barron and Kenny (1986), moderation occurs through three paths:

Model I: Direct Effect (Path 1 – Predictor → Outcome)

$ROA_{it} = \beta 0 + \beta 1FSIZ_{it} + \beta 2FGRO_{it} + \beta 3FLEV_{it} + \beta 4FAGE_{it} + \epsilon_{it}$ ……. Model I

This model represents the direct effect of the independent variables (firm dynamics), namely Firm Size (FSIZ), Firm Growth (FGRO), Firm Leverage (FLEV), and Firm Age (FAGE), on the dependent variable (ROA, a measure of profitability). It corresponds to Path 1 in Baron and Kenny's framework, where the effect of the predictors on the outcome is tested independently of the moderator. A significant result in this model indicates that firm characteristics have a measurable impact on profitability without accounting for the moderating role of governance.

Model II: Moderator's Direct Effect (Path 2 – Moderator → Outcome)

$ROA_{it} = \beta 0 + \beta 1FSIZ_{it} + \beta 2FGRO_{it} + \beta 3FLEV_{it} + \beta 4FAGE_{it} + \beta 5BCON + \epsilon_{it}$ … …. Model II

In Model II, Board Control (BCON), measured as the proportion of independent directors, is added to assess its direct effect on profitability. This corresponds to Path 2, where the moderator itself is tested to determine whether it significantly influences the outcome (ROA). If significant, it confirms that board independence plays an independent role in shaping firm profitability.

Model III: Interaction Effect (Path 3 – Predictor × Moderator → Outcome)

$ROA_{it} = \beta 0 + \beta 1FSIZ_{it} + \beta 2FGRO_{it} + \beta 3FLEV_{it} + \beta 4FAGE_{it} + \beta 5BCON + \beta 6(FSIZ \times BCON)_{it} + \beta 7(FGRO \times BCON)_{it} + \beta 8(FLEV \times BCON)_{it} + \beta 9(FAGE \times BCON)_{it} + \epsilon_{it}$ ……. Model III

Model III introduces interaction terms between firm dynamics variables and Board Control (BCON). This aligns with Path 3 in Baron and Kenny's model, which tests whether the moderator changes the strength or direction of the relationship between the predictors and the outcome. A significant interaction term (e.g., FSIZ×BCON) would indicate that board independence moderates the impact of firm size on profitability, meaning the effect of firm size on ROA differs depending on the level of board control.

RESULT AND DISCUSSION

Table 1: Descriptive Statistics Result

Variable	Obs.	Mean	Std.Dev.	Min	Max
ROA	140	.0709	.0765	.0004	.5515
FSIZ	140	7.3256	.3859	6.5401	8.4540
FLEV	140	.3739	.1925	.0449	1.0521
FGRO	140	.0116	.0847	-.4513	.3388
BCON	140	.5728	.1288	.2857	.8000
FAGE	140	41.57	12.948	19	65

Note. Stata 14 output 2015-2024.
Observation (data point) was arrived at after multiplying 14 firms' x 10 years.

Table 1 shows the descriptive statistics of the variables that were used to determine the moderating effect of board control on the correlation between firm dynamics and profitability in listed Nigerian insurance companies. The mean of the dependent variable, Return on Assets (ROA), is 0.0709, which means that on average, firms made a 7.09 percent return on their assets in the time frame under study. The standard deviation of 0.0765 indicates that there is moderate variability in the profitability, with a minimum of 0.0004 and a maximum of 0.5515, representing significant variation in the operation efficiency, investment strategy, and quality of governance between firms. This result is consistent with the work by Okolie and Uwejeyan (2022), who emphasized the existence of the profitability differences that could be attributed to the board-related factors in Nigerian conglomerates.

The mean of firm size (FSIZ) (natural logarithm of total assets) is 7.3256, and the standard deviation is 0.3859. The range (6.5401-8.4540) is relatively small, which means the size of firms is varied moderately, implying that there are an equal number of small and large insurance companies. The bigger companies might have economies of scale, additional resources, and dominance in the market, which in turn might help them to be more profitable (Kartiningsih and Daryanto, 2020; Nyabaga and Wepukhulu, 2020).

Firm leverage (FLEV) has a mean of 0.3739 with values varying between 0.0449 and 1.0521, hence depicting different debt-utilization methods. Although leverage has the potential to enhance profitability when used effectively, too much debt can promote financial risk (Kartiningsih and Daryanto, 2020). The mean of FGRO is 0.0116, which is not very high but still means that there is growth, but the variability (SD = 0.0847) is quite large, suggesting the existence of variable levels of performance across different firms. There were those companies with negative growth (-0.4513) and others that realized high growth (0.3388), which is in line with the observation by Handoyo et al. (2023) that growth is based on strategic alignment.

Board control (BCON) has a mean of 0.5728 with a standard variation of 0.2857 to 0.8000, which exhibits a heterogeneous level of governance practices. Increased board independence will lead to better monitoring and strategic control, which will contribute to better profitability (Kanakriyah, 2021; Islam and Islam, 2022). The firm age (FAGE) is based on 41.57 years on average, thus evaluating the level of maturity of the insurance companies in Nigeria, but with high levels of variation (SD = 12.948). Older companies can be more experienced and have a brand, but they can also experience bureaucratic inertia (Vitolla et al., 2023; Kartiningsih and Daryanto, 2020).

In general, the descriptive statistics show that there is significant variation in the size of firms, leverage, growth, age, and board governance in the Nigerian insurance firms. These trends can be used as the basis of an inference analysis, especially on the interaction between the board control and the dynamics of a firm in different economic and regulatory situations to affect the profitability.

Table 2: Pearson Correlation

	ROA	FSIZ	FLEV	FGRO	BCON	FAGE
ROA	1.0000					
FSIZ	-0.0751	1.0000				
FLEV	0.1862	0.5226	1.0000			
FGRO	0.6308	0.0546	0.0069	1.0000		
BCON	-0.1928	0.1312	-0.3389	-0.0393	1.0000	
FAGE	0.1616	-0.0631	0.4104	0.0168	-0.1773	1.0000

Note. Stata 14 output 2015-2024.
The rule of thumb for correlation matrix is: 1-10% = very weak association, 11-29% = weak association, 30-60% moderate association and 61 and above strong association.

Table 2 presents Pearson correlation coefficients of ROA, firm dynamics, board control, and firm age. The ROA-firm growth coefficient (FGRO=0.6308) is significantly positive, which means that companies with a higher net-income growth compared with an asset growth are more profitable. This observation supports the findings of Handoyo et al. (2023) and supports the strategic importance of growth in vibrant insurance markets. Moreover, ROA shows weak positive correlations with firm leverage (FLEV = 0.1862) and firm age (FAGE = 0.1616), which indicates the presence of moderate benefits when using debt to operate (Kartiningsih and Daryanto, 2020; Vitolla et al., 2023).

On the other hand, the correlation of ROA with firm size (FSIZ = -0.0751) is extremely small and negative so that bigger asset bases do not necessarily provide higher returns, possibly through the adoption of bureaucratic inefficiency or underutilization of assets (Nyabaga and Wepuptara, 2020). On the same note, ROA has a weak negative association with board control (BCON = -0.1928), which can also be explained by the fact that the latter has a small moderate effect on profitability, which is characteristic of conservative control within the Nigerian insurance markets (Kanakriyah, 2021; Islam and Islam, 2022).

In terms of interrelationships among independent variables, FSIZ and FLEV are positively correlated with moderate strength (r= 0.5226), as well as FLEV and FAGE (r= 0.4104); however, BCON and FLEV are correlated with each other with moderate strength (r= -0.3389). These trends indicate that independent boards prefer low leverage (Abdulkarim and Bahamman, 2020).

In general, the trend of firm growth proves to be the strongest predictor of profitability, and there is no indication of multicollinearity, thus proving that the data is appropriate in the regression and moderation analysis.

Table 3: The Shapiro – WilkTests for Normality Result

Variable	Obs	W	V	Z	Prob>z
ROA	140	0.6971	33.218	7.913	0.001
FSIZ	140	0.9823	1.936	1.493	0.067
FLEV	140	0.9125	9.598	5.109	0.001
FGRO	140	0.8259	19.096	6.662	0.001

BCON	140	0.9358	7.033	4.406	0.001
FAGE	140	0.9420	6.353	4.176	0.001

Note. Stata 14 output 2015-2024.

Table 4.3 gives the Shapiro-Wilk test of the variables under study against the normality test. The continuous non-normality of ROA can be explained by skewed profitability distributions, which may be the result of the outliers or extreme profit/loss values, which are a common occurrence in financial data (Jawed et al., 2023). Likewise, FLEV and FGRO are asymmetrically distributed, which is consistent with firm-specific leverage and growth differentials that are determined by market forces (Kartiningsih and Daryanto, 2020). BCON and FAGE also do not pass normality tests, which are signs of heterogeneity of board independence and maturity of firms that can be observed among the Nigerian insurance companies (Okolie and Uwejeyan, 2022). On the other hand, FSIZ assumes an approximation of normal distribution, which means that the size of assets of firms is relatively symmetrically distributed, which is also supported by previous empirical research in regulatory industries (Nyabaga and Wepupuku, 2020).

In place of these releases of normality, relevant data transformations or sound estimation methods were utilized in order to meet the requirements of the assumptions of parametric inference. The current research included some mean transformation to reduce skew, and the main emphasis was given to assessing the normality of residuals to check the validity of the regression estimates. To enhance the validity of the conclusions on the moderating effect of board control on the relationship between the firm's dynamics and profitability, it is necessary to address non-normality.

Table 4: Multicollinearity Result

Variable	VIF	1/VIF
FSIZ	1.884	.531
FLEV	2.429	.412
FGRO	1.010	.990
BCON	1.348	.742
FAGE	1.397	.716
Mean VIF	1.613	

Note. Stata 14 output 2015-2024.

Table 4 also shows the Variance Inflation Factor (VIF) and tolerance of the independent variables so as to determine multicollinearity in the regression model. The maximum VIF value is that of Firm Leverage (FLEV, 2.429); then the others are Firm Size (FSIZ, 1.884), Firm Age (FAGE, 1.397), Board Control (BCON, 1.348), and Firm Growth (FGRO, 1.010). All the VIF values are well below the critical value of 10, and the average VIF of 1.613 ensures that there is no multicollinearity. The corresponding value of tolerances, which vary between 0.412 and 0.990, are all larger than the minimum acceptable level of tolerance of 0.1, which further supports the fact that the predictors do not depend on each other.

That there is no multicollinearity means that the regression coefficients of the individual variables, including the moderating variable Board Control (BCON), can be interpreted without error. This enables a strong approach in estimating both the individual and interactive influence of firm dynamics on profitability, and thus the validity of the moderation analysis is increased. The findings can be compared to the research by Almashhadani and Almashhadani (2022), who noted that the stability of the models was a critical aspect in the analysis of corporate governance and financial

performance. Similarly, Kartiningsih and Daryanto (2020) and Nyabaga and Wepukhulu (2020) noted that it is crucial to ensure that multicollinearity is too low to avoid the distortion of the firm effects. In this research, there is no multicollinearity, and the relationship between board governance and firm size, growth, leverage, and age can be clearly evaluated in relation to profitability in the Nigerian insurance firms.

Table 5: Heteroscedasticity Test Result

Variables	
Chi^2	17.40
Prob>Chi^2	0.001

Note. Stata 14 output 2015-2024.

Breusch-Pagan / Cook-Weisberg test for Heteroscedasticity

The Breusch-Pagan/Cook-Weisberg test shows that the heteroskedasticity of the regression model is not constant; the value of the test (Chi-squared=17.4, p=0.001) is not equal. Heteroskedasticity may misrepresent standard errors, hence making t-tests and confidence intervals unreliable (Vittinghoff, 2005) and thus causing misleading inferences to the relationships between firm dynamics, board control, and profitability. In this regard, the use of robust regression through the Generalized Least Squares (GLS) methodology was used to rectify the non-constant error variance and also gave more credible estimates of the coefficients. This modification will provide valid statistical inferences and improve the credibility of the findings related to the moderating effect of board governance in Nigerian insurance firms.

Table 6: Robust Regression Results

Variable	Coefficient	Std. error	t-statistic	prob.t
(Constant)	3.5609	1.3568	2.62	0.010
FSIZ	-0.5093	0.1937	-2.63	0.010
FLEV	0.4279	0.1428	3.00	0.003
FGRO	0.9253	0.5389	1.72	0.088
BCON	-5.3569	2.1399	-2.50	0.014
FAGE	0.0001	0.0004	1.92	0.057
BCON*FSIZ	0.7671	0.3029	2.53	0.013
BCON*FLEV	-0.5487	0.2237	-2.45	0.015
BCON*FGRO	-0.6961	0.9325	-0.75	0.457
R Square	0.5694			
F-statistic	6.19			
Prob. (F)	0.001			

Note. Stata 14 output 2015-2024.

Dependent Variable: ROA

The strong regression findings will explain how the firm dynamics, as well as board control, affect profitability in terms of return on assets (ROA) under Nigerian insurance firms, and the issue of heteroscedasticity is taken care of. Firm size (FSIZ) has a negative and statistically significant impact on ROA (= -0.5093, p = 0.010), which is contrary to the results in other industries (Kartiningsih & Daryanto, 2020). The leverage (FLEV) has a positive influence on profitability (0.4279, p 0.003), which shows that successful use of debt increases performance; this is consistent with Nyabaga and Wepukhulu (2020). Firm growth (FGRO) shows the positive and only slightly significant effect (0.9253, p 0.088), meaning that firm growth could enhance profitability, yet the connection is dependent on context (Handoyo et al., 2023).

The statistically significant negative value of the board control (BCON) (5.3569, p = 0.014) indicates that too much independence can limit the flexibility of managers, which is opposite to the previous research works (Kanakriyah, 2021; Islam and Islam, 2022). The age of the firm (FAGE) slightly positively affects it (0.0001, p = 0.057), which means that mature firms might enjoy the benefits of experience and strategic disclosures (Vitolla et al., 2023).

Moderation effects are emphasized in terms of interaction. BCONFSIZ also has a positive moderating effect on the negative size-profitability relationship (= 0.7671, p = 0.013), thus showing that efficient board supervision eliminates size-based inefficiencies (Baron and Kenny, 1986). There is a negative moderating effect of leverage on BCONFLEV (= -0.5487, p = 0.015), indicating that the profits on risk-taking decrease with high governance (Abdulkarim and Bahamman, 2020). The correlation between BCON and FGRO is not meaningful (0.6961, p 0.457); therefore, board control has no significant impact on the growth-profitability dynamics (Ngatno et al., 2021).

The model describes 57 percent of the variation in ROA (R^2 = 0.5694), and the F-value is 6.19 (p = 0.001), which proves the robustness. Altogether, the results highlight the importance of the fact that board governance could boost and limit profitability at the same time, depending on the characteristics of firms, thus indicating the need to carefully monitor the situation in the insurance sector in Nigeria (Karim et al., 2023).

Table 7 Hausman Specification Test Result

Variables	
Chi^2	26.10
Prob>Chi^2	0.001

Note. Stata 14 output 2015-2024.

This was done by an analysis of the Hausman specification test in order to identify the model to be used in the analysis of the panel data that included fourteen listed insurance companies in Nigeria over the period of a decade. The following chi-square statistic of 26.10 (p^{-1}) rejected the null hypothesis and thus indicated that the fixed-effects (FE) model is superior. As a result, the firm specifics, which are correlated with the explanatory variables, should be controlled to prevent a biased parameter estimate. The use of FE specification takes into consideration the unobservable, time-invariant heterogeneity and thus increases the accuracy of the estimated effect related to the dynamics of firms, the board control, and their interaction with profitability. These are in line with Okolie and Uwejeyan (2022).

Table 8: Model Regression Results (Fixed Effect)

Variable	Coefficient	Std. error	t-statistic	prob.t
(Constant)	2.8806	0.9513	3.03	0.003
FSIZ	-0.4229	0.1386	-3.05	0.003
FLEV	0.3410	0.1590	2.14	0.034
FGRO	0.6999	0.1840	3.80	0.001
BCON	-4.0891	1.4136	-2.89	0.005
FAGE	0.0046	0.0022	2.07	0.041
BCON*FSIZ	0.5712	0.1985	2.88	0.005
BCON*FLEV	-0.4603	0.2931	-1.57	0.119
BCON*FGRO	-0.3642	0.3217	-1.13	0.260
R Square	0.3280			
Adj. R Square				

F-statistic	25.81			
Prob. (F)	0.001			

Note. Stata 14 output 2015-2024.
Dependent Variable: ROA

The fixed effects regression findings give an insight into the effects of the firm dynamics, board control, and their interaction on the profitability of the listed insurance firms in Nigeria. Model 1 shows that the firm size (FSIZ) has a negative impact on profit on assets (ROA, β = -0.4229, p = 0.003), which indicates that larger companies might have bureaucratic issues leading to reduced profitability, which is opposed to the results discussed by Kartiningsih and Daryanto (2020). Firm leverage (FLEV) has a positive correlation with ROA (r = 0.3410, p = 0.034), which confirms Nyabaga and Wepukhulu (2020) and the importance of strategic use of debt to increase profitability. Firm growth (FGRO) is also positively related to ROA (0.6999, 0.001), and firm age (FAGE) does (0.0046, 0.041), which means that both accrued experience and reputation on the market contribute to financial performance (Vitolla et al., 2023).

Model II demonstrates that independent directors have a statistically significant negative direct impact on profitability (β = -4.0891, p = 0.005), which may be explained by the fact that independent directors do not have much say in strategic decisions (Abdulkarim and Bahamman, 2020). The model III illustrates that the board control plays a positive moderating role between the size-profitability relationship (FSIZ x BCON: 0.5712 p = 0.005), thus nullifying the negative impact of large firm size. However, on the other hand, the moderation effect of leverage (FLEV x BCON) and the growth (FGRO x BCON) has a negative significance and is not significant, indicating that the board control does not have a strong effect on leverage and growth (Karim et al., 2023).

The model is statistically significant with an R^2 of 0.3280 and an F statistic of 25.81 (p=.001), which means that firm dynamics and board control can explain a significant percentage of the variation in profitability when used together. These results underscore the role of good governance in using firm factors to achieve better financial results and the need to have more board involvement in the Nigerian insurance companies (Okolie and Uwejeyan, 2022).

CONCLUSION

In this research, the moderating variable was the board governance, which was represented by board control, which in turn was used to moderate the relationship between firm dynamics (firm size, growth, and leverage) and profitability of listed insurance firms in Nigeria. With the support of panel data collected on the 14 insurance companies during the 2015–2024 years and the implementation of a moderation-based regression model, the study offers evidence that governance structure is a significant conditioning factor of firm performance outcomes.

The results indicate that firm size has a negative impact on profitability, indicating that bigger insurance companies might be exposed to inefficiencies, elevated administrative expenses, or coordination difficulties, which reduce financial outcomes. Conversely, the development of firms and leverage were found to have a positive impact on profitability, which suggests that increasing operations and wise allocation of debt can lead to an increase in earnings in the Nigerian insurance industry. Notably, board control, in terms of the percentage of independent directors, had a twofold

impact, as on the one hand, it directly decreased the profitability, whereas on the other hand, it enhanced the association between the firm size and profitability to a high degree. This means that independent boards have the ability to reduce the negative implications of the size of a firm through enhanced oversight, discipline, and strategic decision-making. Nevertheless, the moderating role of board control on the impact of the growth and leverage of firms was not very substantial, implying that its governance role is more applicable in the control of scale-related complexities than the growth or funding performance.

All in all, the study highlights the contextual significance of the board governance in the emerging markets such as Nigeria, where the firm characteristics alone are not enough to explain differences in the performance. These findings have an impact on the existing literature on corporate governance and performance in the sense that they indicate that board independence acts as a conditional mechanism, but not a universal performance-enhancing phenomenon. In practical terms, the results indicate that insurance companies ought to moderate the board independence on firm-specific dynamics, especially the risks of scale, and the regulators ought to proceed with the governance change that leads to proper overseeing through the promotion of board reforms without compromising the flexibility of operations. The combination of firm dynamics and governance issues will place the listed insurance companies more in favor of the better profitability and sustainability of the business over time.

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