



**MODERATING ROLE OF FAMILY OWNERSHIP ON THE RELATIONSHIP
BETWEEN MONITORING MECHANISMS AND FINANCIAL
PERFORMANCE OF LISTED INDUSTRIAL GOODS
COMPANIES IN NIGERIA**

***Aminu Zainab Nana¹, Prof. Muhammad Shehu Tijjani²,
Dr Adeyemi Olayinka Tesleem³***

^{1,2,3}Department of Accounting, Ahmadu Bello University Zaria

*Corresponding author(s)'email/mobile: aminuzainab2000@gmail.com/
+2348118757497¹, adeteshplc@yahoo.com/+2348038079555²*

Abstract

This study is aimed at examining the moderating role of family ownership on the relationship between monitoring mechanisms and financial performance of listed industrial good companies in Nigeria. Monitoring mechanism is proxy by board independence, audit committee size, audit committee independence, and audit committee meetings, while financial performance is represented by return on assets. Agency theory was used to anchor the variables used in the study. The population of the study comprised the thirteen (13) industrial good companies listed on the Nigeria exchange (NGX) group and a total of nine (9) firms were used as sample of the study. The study used secondary source of data, collected from published annual reports of sampled firms for a period of ten (10) years spanning from 2014 to 2023. The data obtained was analyzed using the multiple regression technique. The study revealed that board independence and audit committee meetings have negative and insignificant effect on financial performance. While audit committee size was positive and insignificant on financial performance, audit committee independence had a negative and significant effect on financial performance of listed industrial good companies in Nigeria. The study also found that family ownership moderates the relationship between audit committee size and financial performance negatively. Finally, family ownership moderates the relationship between audit committee independence, meetings and financial performance positively. Based on the findings, the study that recommends enhancing the expertise of audit committee attributes, prioritizing the quality of independent directors, and ensuring effective rather than frequent committee meetings. It also recommends improved governance transparency in family-owned firms, mitigation of family influence on audit structures, and stronger regulatory oversight through qualitative monitoring assessments.

Keywords: monitoring mechanisms, financial performance, family ownership, firm size, industrial good companies

1. Introduction

Performance of corporate bodies is the primary objective of every profit-oriented organization (Kurawa & Shuaibu, 2022). The firms' management effectiveness and efficiency in making use of company's resources is highly reflected by high financial performance

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and this in turn contributes to the country's economy at large (Naser & Mokhtar, 2004). Company performance is crucial for management and other stakeholders, including shareholders, debt holders, and the government. It reflects the outcomes achieved by individuals or groups within an organization, based on their authority and responsibility in meeting goals legally, while adhering to ethical and moral standards. It is for this reason the financial performance of a firm needs to be safeguarded by putting in place monitoring mechanisms in order to oversee the effectiveness and efficiency of its operations.

Despite the numerous safeguards put in place by firms, there have been well documented corporate scandals such as the Cadbury Nig Plc scandal in 2006 and this has remained a reference point for fraudulent financial reporting. Other incidences of fraudulent financial reporting in Nigeria include the fraud at Afribank Plc, the case of Oando oil Plc and Arik airline are the corporate frauds recorded in 2017, Gupta scandal in 2017, Samsung accounting scandal in 2018, Wells Fargo and Co. in 2018, Nissan in 2018, Tesla corporate scandal in 2018, Steinhoff corporate fraud in 2019 and Wirecard accounting fraud in 2019 among others (Falope et al., 2024).

The role of monitoring mechanisms in influencing firm's financial performance has been discussed from two point of views. First, there is the claim that monitoring mechanisms framework reduces managers' opportunistic desire to participate in unethical behavior. They ensure corporate conformance with investors and society's interests and expectations by limiting the abuse of power, the siphoning-off of assets, the moral hazard, and the wastage of corporate controlled resources and several other variants of the agency problem (Daniel et al., 2021).

Second, the monitoring mechanisms put in place by firms ensures the responsible and efficient use of resources while safeguarding the assets of the corporate organization. In the process of ensuring ethical and professional standards and the pursuit of corporate objectives, it seeks to ensure customer satisfaction, high employee morale and the maintenance of market discipline, which eventually results in corporate stability and improve financial performance (Ojeka et al., 2013; Okoi et al., 2014).

The continuous failure and collapse of major business organization globally has been traced to weak monitoring mechanisms which has raised doubts in the users of accounting information resulting in questioning the integrity of the reported accounting information because users depend exclusively on the financial statements published by corporate organizations to make essential decisions. This has led to the critic of the effectiveness of the board towards its financial reporting responsibilities and overall performance of the firm (Aifuwa & Embele, 2019).

Monitoring mechanism attributes such as audit committee and independent directors do not always sufficiently perform their duties. Their performance can be influenced by their independence from management (Abu, 2023). Companies and allied matters act [CAMA] (2020) stipulate the fiduciary duties of the directors, such as to promote the success of the company for the benefit of the shareholders and to exercise independent judgment on behalf of its shareholders.

Agency theory upholds the view of delegation and centralization of control in the board of directors and use of compensation incentives. Agency theory is of the view that

when ownership and control are separated, it leads to divergence in the pursuit of managerial interests and owner's interest (Jensen & Meckling, 1976). Therefore, there are circumstances in which the board and shareholders are likely to have conflicting goals. For instance, a situation where incentives given to directors are based upon the performance of the firm in which they manage, the board might be conflicted about reporting the exact sales or profit made during the year and will likely engage in crimes such as income smoothing, earnings management, and creative accounting to mention a few.

The effectiveness and efficiency of directors in managing and monitoring the managers of the organization depends on monitoring mechanisms. One of the components of monitoring mechanisms is board independence. Board independence is the number of independent non-executive directors on the board relative to the total number of directors. There is a distinct belief that boards with large proportion of independent non-executive directors are more effective in making better decisions than boards dominated by inside directors.

Due to inconsistencies in the findings, family ownership has been introduced as a moderator in order to strengthen the relationship between monitoring mechanisms and financial performance of listed industrial goods companies in Nigeria. Family ownership is chosen as a moderator because in family-owned firms, the alignment of interests between management and ownership is often stronger because family members may be both owners and managers. This reduces traditional agency conflicts and could diminish the perceived necessity of certain monitoring mechanisms. Based on available evidence, few studies have investigated the moderating role of family ownership on the relationship between monitoring mechanisms and financial performance, particularly within the Nigerian context.

2. Literature Review

This section begins with a conceptual review of the variables involved in the study, followed by a literature review and ends with a discussion of the theories anchoring the variables.

Conceptual Review and Hypothesis Formulation

Performance is a concept used to examine the level at which an organization has succeeded in its line of business (Nwanyanwu, 2015). Almajali et al., (2012) argue that firm performance is basic to management because it is an achievement of an individual or a group of individuals in an organization related to its authority and responsibility. However, performance is divided into financial and non-financial indicators, financial performance is in most cases determined by profitability, liquidity and firm's value, while non-financial performance could be determined by customer retention rate, customer lifetime value, website traffic to mention a few.

Mirza and Javed (2013) opine that financial performance is crucial to investors, shareholders and the economy because it highlights the efficiency of the board and the firm's economic well-being. Therefore, financial performance is one of the primary indicators of firm's performance as a result of its direct contribution to maximization of shareholders' wealth.

Bayaraa (2017) indicated that there are numerous approaches to the measurement of financial performance including the calculation of ratios and the evaluation of explanatory

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variables. In particular, Bayarara (2017) categorized the financial measurement strategies into the measure of liquidity and profitability using growth as an explanatory variable. Hence, there are numerous ratios used in measuring the financial performance of an organization. In the context of this study, the financial performance is proxied by return on assets.

Return on assets is used because it gauges how well an organization utilizes its internal resources and assets to improve performance. Return on Assets (ROA) represents the amount of earnings (before interest and tax) a company can achieve for each naira of assets it controls and is a good indicator of a firm's profitability (Onyali & Okerekeoti, 2018).

Monitoring mechanisms are proxied by board independence, audit committee size, audit committee independence and audit committee meetings. First, Board independence represents the degree to which the board consists of outside directors who are not affiliated with the company (Obaje et al., 2021). It is measured by the percentage of independent non-executive directors (INED) on board and it has great influence on firm performance in that a highly independent board will be able to effectively reduce agency problem by effective monitoring of the managers to mitigate their opportunistic behavior (Oyedokun, 2019; Uadiale, 2010). The ability of the board to effectively monitor the top management and to mitigate the agency problems is greatly dependent on the board independence as the outside directors have absolutely no stake in the firm (Altuwaijri & Kalyanaraman, 2016).

Second, Asiriwa et al., (2018) defined audit committee size, as the number of persons that make up the committee. According to Jensen (1993), the audit committee monitoring oversight functions is better for companies with small-sized audit committee. The reason for this is that small boards facilitate smooth communication, minimizing bottlenecks in decision-making. For the purpose of this study, Audit committee size is defined as the total number of those charged with overseeing of audit affairs in the organization.

Furthermore, Oji and Ofoegbu (2017) posited that an independent audit committee member is a person who is not employed by or providing any services to the organization beyond his or her duties as a committee member. Audit committee independence implies that its members are free from any relationship and independent from the company's management or having no relationship with any major shareholders, officers and executive directors (Umoh et al., 2021). In relation to this study, audit committee independence is defined as the proportion of independent non-executive directors in the audit committee to the total number of members in the audit committee.

Additionally, Audit committee meetings buttress the effectiveness of the committee which should be observed from the number of meetings they hold in a year (okeke, 2021). Ntim and Osei (2011) proposed that as decisions released from board meetings are effective in reducing agency costs and conflicts of interest, the frequency of meetings will convert into owners' value maximization. This is the number of times in a year that the audit committee members have their meetings. Frequent meetings create avenue for deliberation of key issues that concerns the firm (Oziegbe & Inua, 2020). For the purpose of this study,

audit committee meeting is defined as the number of times those charged with monitoring hold meetings in a financial year.

Nevertheless, family-owned business (FOB) is one where numerous members of the same family hold key positions as managers or owners at the same time or over the course of several years (Miller et al., 2007). A family enterprise is a form of ownership in which family members own a majority of the enterprise's equity, management, and operating rights (Minh Ha et al., 2022).

Empirical Review

Board Independence and Financial performance

Fakile and Adigbole (2019) examined the effect of board characteristics and financial performance of quoted information communication and technology companies (ICT). The period of study covered five years (5) from 2013-2017. Secondary source of data was obtained from annual reports of seven (7) companies and tested using ordinary least square regression. Findings revealed that board independence had a significant effect on financial performance of quoted (ICT) companies. The presence of independent non-executive directors was found to positively influence monitoring mechanisms. Separating roles can enhance the board's ability to carry out its oversight duties more effectively, as it promotes independence.

Furthermore, James and Ajayi (2019) examined the relationship between board characteristics and profitability of deposit money banks in Nigeria. The population of the study comprised of eight (8) banks with international operating license listed on the Nigerian exchange group (NGX) as at 2018. The period of study covered a period of four years (4) from 2014-2018. Board independence was found to have a positive and significant relationship on financial performance. Therefore, a greater proportion of independent non-executive directors on the board will enhance profitability of banks. These findings may however be biased as not all the population of the banks were taken into consideration but only a segment which could affect the validity of the findings.

Okoyezu et al., (2020) investigated the effect of board independence and gender diversity on bank performance in Nigeria. The study found that board independence is a significant negative predictor of bank performance. The finding that board independence negatively affects bank performance is counterintuitive and contradicts much of the existing literature, which typically views board independence as a mechanism for enhancing oversight and reducing agency problems. Therefore, this hypothesis was formulated.

H₀₁: Board independence has no significant relationship on financial performance

Audit Committee Size and Financial Performance

Iheyen (2021) explored the link between audit committee characteristics and the corporate value of listed insurance firms in Nigeria. The study focused on a population and sample comprising all insurance companies, selecting 25 firms using purposive sampling. An ex-post facto research design was applied due to the nature of the dataset, which spanned eight years (2012–2019). Specifically, it was found that audit committee size has a negative and insignificant effect on firm value. Although the study claims to focus on "all listed insurance firms," it still uses purposive sampling, which is typically non-random and introduces selection bias. If the intention was to study the full population, census sampling

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would be more appropriate. The contradiction reduces transparency and methodological rigor.

Kasthury and Anandasayanan (2021) investigated the influence of audit committee characteristics on the financial performance of firms within the consumer discretionary industry, one of the 11 GICS sectors listed on the New York Stock Exchange (NYSE). Out of the 35 companies in the consumer discretionary sector, 20 were selected using a purposive sampling method. The research relied on secondary data extracted from the annual reports of these companies for the period from 2015 to 2021. Statistical techniques such as Descriptive Statistics and Panel Data Regression Analysis were employed to examine the data. Audit committee size was found to be positive and significant on financial performance. The use of purposive sampling (selecting 20 out of 35 firms) raises concerns about selection bias and the representativeness of the sample. Without clear criteria for inclusion, there's a risk that the sample may skew toward more transparent, better-performing, or data-rich firms, thereby overestimating the governance–performance relationship. This hypothesis was formulated.

H₀₂: Audit committee size has no significant relationship on financial performance Audit Committee Independence and Financial Performance

Umoh et al., (2021) examined the impact of Audit Committee characteristics on the financial performance of listed consumer goods companies in Nigeria. The sample comprised of eighteen (18) consumer goods companies and secondary data was generated from the annual accounts and reports which spanned from 2010 – 2019 financial years. Audit committee independence was found to have a positive and significant influence on financial performance.

In addition, Iheyen (2021) investigated the relationship between audit committee attributes and the value of the firm of listed insurance companies in Nigeria. Data was obtained from the Nigerian Stock Exchange fact-book, and annual reports and accounts the listed insurance companies on the Nigerian Stock Exchange from 2012-2019. The population comprised of 32 insurance companies listed on the Nigerian exchange group as at December 2020. The purposive sampling technique was adopted in selecting twenty-five (25) listed insurance companies. Findings revealed that audit committee independence significantly and positively affects the value of the firm. Although the population comprised 32 firms, the researcher selected 25 using purposive sampling, which is non-random and susceptible to selection bias. This choice of sampling limits the generalizability of the findings to the entire insurance sector, and weakens the representativeness of the study.

Eni-Egwu et al., (2022) examined the connection between corporate governance and the financial performance of listed deposit money banks in Nigeria. The study utilized data from the period 2010 to 2019 and employed multiple regression analysis alongside Smart PLS structural equation modeling (SEM), with data analysis carried out using SPSS version 21. The findings showed that audit committee independence has a negative and insignificant effect on the financial performance of the listed deposit money banks in Nigeria.

H₀₃: Audit committee independence has no significant relationship on financial performance

Audit Committee Meetings and Financial Performance

Ashari and Krismiaji (2020) explored the relationship between audit committee attributes and the financial performance of manufacturing firms listed on the Indonesian Stock Exchange during the period of 2016 to 2017. The study examined a sample of 660 publicly listed companies and utilized regression analysis to estimate the data. The findings indicated that audit committee meetings had a positive impact on corporate financial performance.

Furthermore, Oudat et al. (2021) examined the relationship between audit committee characteristics and the financial performance of service sector companies listed on the Bahrain Stock Exchange from 2012 to 2019. The study employed linear panel regression for data analysis and found that audit committee meetings has a positive and significant financial performance.

Whereas, Shamsudeen and Alshahri (2022) examined the impact of audit characteristics on two financial performance indicators: ROA and Tobin's Q. This study was conducted on 63 non-financial firms listed on the Muscat Securities Market (MSM) in Oman for the period from 2016 to 2019. The findings revealed that audit committee meetings have a negative and insignificant effect with return on assets and Tobin's Q.

H₀₄: Audit committee meetings have no significant relationship on financial performance

Family Ownership, Monitoring Mechanisms and Financial Performance

Al-Musali et al., (2019) investigated the impact of ownership structure on audit committee effectiveness on top GCC capitalized countries. Data was drawn from annual reports of 119 top listed firms in Gulf Co-operation Council (GCC) nations. Ordinary least squares regression analysis was constructed to examine the relationships between ownership types and the level of AC effectiveness. The findings revealed that family, government and institutional ownership, in addition to board independence, all have significant positive association with AC effectiveness, and they serve as a complement to AC effectiveness.

Kamaludin et al., (2020) examined the effect of audit committee diligence on firm performance with family ownership as a moderator. The population consisted of 458 firms from the Saudi Arabian stock exchange from the period of 2012-2016. Panel data analysis was used to test the hypothesis. The study found that audit meetings had a significant negative effect with firm performance. While, family ownership also had a significant negative effect on audit meetings and firm performance.

Minh Ha et al., (2022) examined the effect of family ownership and other factors on firm performance in Vietnam. The study employed the quantitative method of data analysis on 31 non-financial firms listed on the Ho Chi Minh City Stock Exchange (HOSE) in Vietnam between 2011- 2019. The study revealed that family ownership has a negative but significant effect on firm performance. The study was limited to only family ownership characteristics and failed to take into account the influence of corporate governance attributes has on financial performance.

H₀₅: Family ownership does not moderate the relationship between monitoring mechanisms and financial performance

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3. Methodology

Research Design

This study employed the ex-post facto research design in examining the moderating role of family ownership on the effect of monitoring mechanisms on financial performance of listed industrial goods companies in Nigeria. Ex-post facto study also known as after-the-fact research is a research design that looks into how an explanatory variable influence an explained variable and investigation starts after-the-fact has happened without any manipulation from the researcher.

Population of the Study

The population of the study consisted of all thirteen (13) industrial goods companies listed on the Nigerian exchange (NGX) group as at December, 2023. The justification for choosing the industrial goods sector is because according to the critical role of the industrial sector is predicated on the fact that it acts as an engine of growth by broadening the productive and export base of the economy, reducing unemployment and stemming rural-urban drift as well as helping to reduce poverty (Umoro & Eborieme, 2013).

Sample Size of the Study

The study adopted the purposive sampling technique where nine (9) were selected from a population of thirteen (13) through the application of two-point filtering criteria that include companies that have been listed on the Nigerian Exchange Group for more than ten years, and companies that have completed annual reports within the study period.

Sources and Method of Data Collection

The sources of data to be used in the study is secondary data. Secondary data will be extracted and collected from the audited and published annual financial statements of the listed industrial goods companies on the Nigerian exchange group (NGX) from 2014-2023. All the variables (board independence, audit committee size, audit committee independence, audit committee meeting, family ownership) will be obtained from the annual reports. The annual reports will be sourced from the company's website. The method of data collection will be the secondary data analysis, which involves using existing data that has been collected for another purpose. The justification for using this method is that it makes the hard-to-reach population accessible.

Techniques of Data Analysis

Multiple regression techniques was utilized for the study and STATA software was employed to analyze the data. Panel data was used in the study. Also, supportive analyses like descriptive statistics which gives detailed information on the maximum, minimum, and standard deviation of the data set and also correlational matrix showing the strength and direction of variables was computed. However, this technique was utilized because of the fact they provide more information, as estimates are more efficient under them. Also, this technique provides details on time order of events and enable control of individual unobserved heterogeneity.

The model explores the moderating role of family ownership on the relationship between monitoring mechanisms and financial performance, incorporating firm size as a control variable.

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$$ROA_{it} = \alpha + \beta_1 BI_{it} + \beta_2 AUDSZ_{it} + \beta_3 AUDIND_{it} + \beta_4 AUDMT_{it} + \beta_5 FO_{it} + \beta_5 FZ_{it} + \beta_6 BI_{it} * FO_{it} + \beta_7 AUDSZ_{it} * FO_{it} + \beta_8 AUDIND_{it} * FO_{it} + \beta_9 AUDMT_{it} * FO_{it} + \mu_{it}$$

The model identifies several independent variables which were hypothesized to influence financial performance. Board independence reflects the proportion of independent non-executive directors to the total number of directors. Audit committee size shows the total number of directors on the board. While Audit committee independence depicts the proportion of independent non-executive directors to the total number of directors on the audit committee. Audit committee meetings represents the total number of meetings held by the audit committee during the reporting period. Family ownership represents the total percentage of shares held by family members. Lastly, Firm size shows the natural logarithm of total assets. The error term (μ_{it}) captures unobserved factors and random disturbances that may influence the ROA.

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Variables Definition and Measurement

Table 1 *Variables Measurement*

Name	Variable Acronym	Variable Type	Proxies	Sources
Return on Assets	ROA	Dependent	Profit before taxation divided by total assets	(Tyas & Khalid, 2020; Jibril et al., 2023)
Board Independence	BI	Independent	Number of independent non-executive directors to the total number of directors	(Illaboya & lodikero, 2017; Oyedokun, 2019)
Audit Committee Size	ACS	Independent	Total number of audit committee members	(Guping et al., 2020; Abu, 2023)
Audit Committee Independence	ACI	Independent	Number of independent non-executive directors to the total number of directors on the committee	(Jibril & Maikano, 2022; Jibril et al., 2023)
Audit Committee Meetings	ACM	Independent	Total number of committee meeting during the reporting period	(Manita et al., 2018; Shabhaz et al., 2020)
Family Ownership	FO	Moderator	Total Percentage of shares held by family members	(Kamaluddin et al., 2020)
Firm Size	FS	Control	Natural Logarithm of total assets	(Badara, 2016)

Source: Author's compilation from various sources (2025)

4. Results and Discussions

Descriptive statistics

This section provides an analysis of the descriptive statistics for the variables used in the study. The summary includes the number of observations, mean, standard deviation, minimum and maximum values for each variable.

Table 2: Descriptive Statistics

Variables	Obs	Mean	Std.Dev	Min	Max
ROA	90	0.0889	0.0823	-0.1256	0.4045
BI	90	0.0250	0.0139	0	0.5
ACS	90	5.2556	0.8939	3	8
ACI	90	0.3454	0.1639	0	0.75
ACM	90	3.688889	0.5537	3	5
FO	90	14.4834	27.7606	0	90.93
FS	90	23.5054	2.312355	20.16759	28.38058

Source: Researcher's Computation from STATA Output, (2025)

In Table 2 above it can be seen that the mean ROA for the sample is approximately 8.89% indicating that on average industrial goods firms in the sample earn 8.89% in profit for every unit of assets they hold. The standard deviation of 8.23 suggests that there is moderate variability around the mean ROA, indicating some differences in profitability among the firms in the sample. The minimum ROA in the observation is -12.56%, suggesting that some firms experienced negative returns, while the maximum ROA is 40.5%, indicating the highest profitability observed in the sample. The positive mean ROA suggests that, on average, firms in the study are profitable. However, the presence of negative ROA for some firms indicates that there are firms facing financial challenges.

The average Board Independence (BI) in the sample is approximately 2.5%, indicating that, on average, only a very small portion of board members in the sample firms are independent. Given that BI is expressed as a ratio, this translates to a relatively low level of board independence across the sampled firms. The standard deviation of 1.40% suggests slight variation in board independence levels among the firms. The minimum value is 0, indicating that some firms have no independent directors on their boards, while the maximum is 50%, showing that some boards are composed of up to half independent directors. The very low average and minimum values could reflect non-compliance with the Nigerian Code of Corporate Governance (NCCG), which mandates at least one independent non-executive director on the board.

The average Audit Committee Size (ACS) in the sample is approximately 5, indicating that firms, on average, have around five members in their audit committees. The standard deviation of 0.89 suggests relatively low variability, meaning most firms have a similar audit committee size. The audit committee size ranges from a minimum of 3 to a maximum of 8, indicating a range of 5 members across the sample.

The average Audit Committee Independence (ACI) is 34.54%, indicating that, on average, about one-third of the audit committee members in the sample are independent. The standard deviation of 16.39% indicates some degree of variation in the level of independence. The ACI values range from 0% to 75%, suggesting that while some firms have no independent members on their audit committees, others have up to three-quarters of the members as independent. The minimum of 0 could again reflect non-compliance with

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corporate governance expectations, particularly those aimed at ensuring audit committee objectivity.

The average Audit Committee Meetings (ACM) held by firms in the study is approximately 4, indicating that audit committees, on average, meet around four times per year. The standard deviation of 0.55 suggests low variability in the frequency of meetings, meaning most firms hold a similar number of audit meetings. The number of audit meetings ranges from a minimum of 3 to a maximum of 5, indicating a range of 2 meetings across the sample.

The average FO for the sample is approximately 14.48%, indicating that, on average, firms in the study have 14.48% family ownership in the given context. The standard deviation of 27.76% suggests high variability in FO among the firms, meaning some firms have significantly higher or lower ownership levels than others. The minimum FO is 0%, indicating that some firms in the sample have no family ownership presence, while the maximum FO is 90.93%, indicating that some firms have a very high family ownership concentration. The wide range of 90.93 percentage points suggests that firms in the study vary greatly in ownership structure, with some having little to no family ownership and others having a dominant family ownership presence.

The average Firm Size (FS) in the study is approximately 23.51. The standard deviation of 2.31 suggests moderate variability in firm sizes across the sample. Firm size ranges from a minimum of 20.17 to a maximum of 28, indicating a range of 7.83 in firm size across the sample.

Diagnostic Tests

Multicollinearity

Multi-collinearity test was conducted to detect presence of high inter-correlation between two or more independent variables used in the study, which may affect the validity of the result to be interpreted for the study.

Table 3: Variance Inflation Factor and Tolerance Value

Variable	VIF	1/VIF
BI	3.26	0.3064
ACS	1.61	0.6228
ACI	3.03	0.3298
ACM	1.48	0.6769
FO	1.80	0.5569
FS	2.38	0.4197
Mean	2.26	

Source: Researcher's Computation from STATA Output, (2025)

To check for multicollinearity, the rule of thumb is that if a tolerance value is greater than 0.1 and less than 1, and if VIF is greater than 1 but less than 10; there is no multicollinearity among the independent variables (Gujarati, 2004). From Table 3 above, the tolerance value (1/VIF) of all the individual variables are greater than 10% and less than 1. So also, all the values of VIFs are greater than 1 and less than 10 for all the categories of the data which confirms absence of multicollinearity among the variables. The mean VIF

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value of 2.26 indicates the overall average level of multicollinearity among the explanatory variables in the model. Since the mean VIF is far below the threshold of 10 (and even the stricter benchmark of 5 sometimes used in econometrics), it suggests that the explanatory variables do not exhibit harmful levels of collinearity.

Correlation Matrix Analysis

The correlation matrix presented in table 4 below indicates the strength and direction of the relationship between each independent variable and the dependent variable. Correlation coefficient ranges from -1 to +1, where values closer to -1 or +1 indicate strong positive or negative relationship respectively. Values close to 0 suggest little or no linear relationship.

Table 4:

Correlation Matrix

Variables	ROA	BI	ACS	ACI	ACM	FO
ROA	1.000					
BI	0.2136	1.000				
ACS	0.3328	0.1468	1.000			
ACI	0.1220	0.6863	0.4736	1.000		
ACM	0.4326	0.2476	0.2305	0.3698	1.000	
FO	0.3378	0.4188	0.2137	0.1797	-0.0837	1.000
FS	0.3977	0.5951	0.2550	0.3579	0.3641	0.5555

Source: Researcher's Computation from STATA Output, (2025)

In Table 4 above BI shows a weak positive correlation with ROA (0.2136), indicating a slight relationship between board independence and financial performance. However, the relationship is not strong, implying that board independence alone may not be a significant determinant of ROA. ACS has a moderate positive correlation with ROA (0.3328), suggesting that firms with larger audit committees tend to have higher returns on assets. This could be due to enhanced oversight and stronger financial monitoring.

ACI shows a weak positive correlation with ROA (0.1220), implying a slight association between audit committee independence and financial performance, but the relationship is not strong suggesting little to no practical significance. However, the low correlation suggests that other factors may play a more crucial role in determining profitability. ACM has a moderate positive correlation with ROA (0.4326), indicating that an increase in audit committee meetings is associated with improved financial performance. This may be because frequent meetings enhance governance, risk assessment, and financial oversight.

FO shows a moderate positive correlation with ROA (0.3378), suggesting that firms with higher family ownership tend to perform better. FS has a moderate positive correlation with ROA (0.3977), indicating that larger firms tend to have higher returns on assets. BI and ACI (0.6863) have a strong positive correlation, indicating that firms with a more independent board also tend to have a more independent audit committee. Although BI and ACI have a strong positive correlation which could indicate this presence of multicollinearity. However, it is less than 0.75 which is considered harmful for the purpose of analysis (Gujarati & Sangeetha, 2007, Berenson & Levine, 1999).

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FS and BI (0.5951) show a relatively high correlation, suggesting that larger firms tend to have higher board independence. FS and FO (0.5555) have a moderate positive correlation, implying that larger firms are more likely to have family ownership. ACM and FO (-0.0837) show a weak negative correlation, suggesting a slight inverse relationship between family ownership and audit committee meetings, though the relationship is not strong. This implies that an increase in family ownership is slightly associated with fewer audit committee meetings. However, the correlation is very low, suggesting that this relationship is not practically significant.

Regression Analysis

Table 5: Generalized Least Square Regression

ROA	Coef	St.Err	Z	P-value
BI	-22.7315	33.847	-0.67	0.502
ACS	2.7109	4.6303	0.59	0.558
ACI	-111.93	35.951	-3.11	0.002
ACM	-11.619	14.065	-0.83	0.409
FO	-0.3815	0.5556	-0.69	0.492
FS	3.0760	2.0869	1.47	0.141
BIFO	-16.847	12.345	-1.36	0.172
ACSFO	-91.252	24.978	-3.65	0.000
ACIFO	15.548	8.5191	1.83	0.068
ACMFO	87.374	26.452	3.30	0.001
Cons	45.180	63.797	0.71	0.479
Prob> Chi2	0.000			
Wald Chi2(5)	70.49			
R-squared	0.3578			
No Obs	90			

Source: Researcher's Computation from STATA Output, (2025)

Discussion and Findings

Table 5 presents the results of the Generalized Least Squares (GLS) regression conducted to examine the impact of selected monitoring mechanisms and the moderating role of family ownership on the financial performance of listed industrial goods firms in Nigeria, with Return on Assets (ROA) as the dependent variable. The model yields a Wald chi-square statistic of 70.49 ($p < 0.001$), indicating that the set of explanatory variables is jointly statistically significant. The R-squared value of 0.3578 implies that approximately 35.78% of the total variation in ROA is explained by the model. The number of firm-year observations is 90.

The coefficient for Board Independence (BI) is negative (-22.73) but statistically insignificant ($p = 0.502$), suggesting that the proportion of independent directors on the board does not significantly influence firm performance in isolation. Similarly, Audit Committee Size (ACS) shows a positive but non-significant relationship with ROA ($\beta = 2.71$, $p = 0.558$), implying that simply increasing the number of audit committee members

may not contribute meaningfully to improved financial outcomes.

On the other hand, Audit Committee Independence (ACI) exhibits a statistically significant and substantial negative effect on ROA ($\beta = -111.93$, $p = 0.002$), indicating that greater independence of audit committee members is associated with a significant decline in firm performance. This result may reflect the potential downside of excessive independence, such as lack of firm-specific knowledge or weaker alignment with managerial decision-making.

The coefficient for Audit Committee Meetings (ACM) is also negative ($\beta = -11.62$), but the effect is not statistically significant ($p = 0.409$). This suggests that more frequent meetings of the audit committee do not, in themselves, guarantee improved monitoring or financial outcomes.

Regarding ownership structure, Family Ownership (FO) has a negative but statistically insignificant coefficient ($\beta = -0.38$, $p = 0.492$), indicating that family ownership alone does not exert a direct influence on performance. Similarly, Firm Size (FS) has a positive and insignificant effect ($\beta = 3.08$, $p = 0.141$), implying that larger firms may be more profitable, although the relationship is not robust within the sample. The interaction between board independence and family ownership (BIFO) is negative and statistically insignificant ($\beta = -16.85$, $p = 0.172$), indicating that family ownership does not significantly alter the (non-significant) effect of board independence on firm performance.

Three interaction terms were included to assess whether family ownership moderates the relationship between audit committee characteristics and firm performance: The interaction between audit committee size and family ownership ($ACS \times FO$) is negative and highly significant ($\beta = -91.25$, $p < 0.001$), indicating that in family-controlled firms, increasing the size of the audit committee significantly reduces ROA. This suggests that family owners may resist broader committee structures, possibly due to concerns over loss of control or increased agency costs.

The interaction between audit committee independence and family ownership ($ACI \times FO$) is positive and marginally significant ($\beta = 15.55$, $p = 0.068$), suggesting that the negative effect of audit committee independence on performance is weakened in firms with higher levels of family ownership. This may reflect a more effective alignment of independent oversight with the strategic interests of the family, thereby moderating the adverse performance implications of independence.

Finally, the interaction between audit committee meetings and family ownership ($ACM \times FO$) is positive and statistically significant ($\beta = 87.37$, $p = 0.001$). This finding suggests that in the presence of high family ownership, more frequent audit committee meetings enhance financial performance. This could indicate more proactive and efficient monitoring in family-controlled environments where the controlling interest aligns closely with the firm's long-term value creation.

5. Conclusion and Recommendations

This study investigated the influence of board and audit committee characteristics on the financial performance of listed industrial goods firms in Nigeria, with a particular focus on the moderating role of family ownership. Using GLS regression analysis, the findings reveal that, individually, most corporate governance mechanisms—such as board independence, audit committee size, and meeting frequency—do not have a statistically

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significant direct effect on firm performance, as measured by Return on Assets (ROA). However, audit committee independence emerged as a significant negative determinant of performance, implying that higher levels of independence may be counterproductive in some firm contexts, possibly due to reduced insider knowledge or a lack of alignment with management strategies.

Importantly, the study provides robust evidence that family ownership moderates the relationship between audit committee characteristics and firm performance. While audit committee size and frequency of meetings alone are not significant, their interaction with family ownership significantly affects performance—negatively for committee size and positively for meeting frequency. These findings suggest that the effectiveness of monitoring mechanisms is not uniform across firms but is instead contingent upon ownership structure.

The study concludes that the monitoring-performance relationship is nuanced and deeply embedded in firm-specific contexts such as ownership type. In family-controlled firms, governance structures operate under different dynamics, and mechanisms traditionally seen as effective in widely held firms may have unintended effects.

In view of the findings, several practical recommendations are proposed. First, corporate governance reforms should be context-specific, especially in countries like Nigeria where family-controlled firms dominate the industrial landscape. Policymakers and regulators are advised to avoid a one-size-fits-all approach and instead promote governance structures that consider the unique dynamics of ownership concentration, particularly family ownership.

Second, firms should critically re-evaluate the role of audit committee independence. While independence is often promoted as a best practice, this study shows that excessive independence without sufficient understanding of internal operations can have adverse effects on financial performance. Therefore, it is important to ensure that independent audit committee members possess not only technical competence but also relevant industry knowledge and contextual awareness.

Third, the findings suggest that family-owned firms should avoid unnecessarily large audit committees, as this may dilute the effectiveness of oversight and introduce coordination challenges. Instead, leaner committees with focused responsibilities may perform better in such ownership settings. Moreover, increasing the frequency of audit committee meetings in family firms appears to be beneficial. Hence, firms with high levels of family ownership are encouraged to promote more frequent and structured meetings to strengthen monitoring and financial discipline.

Fourth, it is recommended that family firms invest in governance training and orientation programs for board and audit committee members. This can help bridge the gap between external oversight and internal realities, particularly for independent members. Future research should extend this analysis by exploring these governance-performance dynamics across different sectors and incorporating alternative performance metrics. Longitudinal studies could also be useful in establishing causal relationships and observing changes over time.

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