

Board Structure and Financial Performance of Listed Industrial Goods Companies in Nigeria

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Abstract

This paper examined the impact of board structure on financial performance of listed industrial goods firms in Nigeria between the years 2015 and 2024. In particular the research was on the effect of board size, board independence, and CEO duality, on financial performance, defined as Return on Investment (ROI). The study is motivated by the discrepancy in the previous empirical literature and the fact that little has been done on the industrial goods sector in Nigeria. Ex-post facto research design was used and the secondary data were collected in the form of annual report of eight of the selected industrial goods listed companies and the total response of 80 panel was obtained. The panel least squares regression was used to analyze the data by considering the fixed effects in order to take care of firm-specific characteristics. The results showed that the size of the boards exerts a negative and significant influence on financial performance so that increasing the board size can result in decreased efficiency because of coordination and decision-making issues. However, the board independence had a positively correlated but statistically irrelevant relationship with financial performance, which suggests that independent directors can have a beneficial effect on governance, but the effect on performance is less significant. CEO duality, also, had a positive and non-significant impact on financial performance, which suggests that being a

CEO and board chairman does not have a significant impact on firm performance. The research finds out that board structure has an impact of being a determinant of firm performance with the board size being most sensitive. It suggests that the companies should have an optimum size of the board to achieve good decision making and financial performance as well as to reinforce the overall practices of corporate governance.

Keywords: Board Structure, Board Size, Board Independence, CEO Duality, Financial Performance, Return on Investment (ROI).

1 Introduction

Effective board structures and corporate governance can be considered as important mechanisms to accountability, transparency, and sustainable performance within modern organizations (Sari, 2023). The board of directors is very important in the checking of the management and safeguarding the interest of the shareholders and other stakeholders. Good boards and corporate governance practices are thus essential in ensuring that the credibility and trust of people in corporate institutions and capital markets remain high. Inappropriate corporate governance can lead to ineffective boards, ineffective monitoring systems, and, finally, corporate failures (Abu, Okpeh & Okpeh, 2016). This renders the research on board structure especially significant in comprehending the

financial performance of companies in various sectors of the economy as well as industrial goods companies. Corporate governance has gained considerable attention in the past few decades by scholars, regulators, and practitioners across the world. To a great extent, this heightened focus was prompted by the fall of a number of multinational corporations that had been deemed too large to fall, such as Enron, Tyco, Xerox, Parmalat and Cadbury. Such corporate failures greatly destroyed investor trust in capital markets and cast serious doubts on effectiveness of corporate boards in overseeing management practices (Mgbemena, Oge, Nwankwo, & Onah, 2024). Consequently, regulatory agencies worldwide brought out reforms on corporate governance to enhance board supervision and accountability. In the United States, e.g., the Sarbanes-Oxley Act 2002, or Public Company Accounting Reform and Investor Protection Act, was created to govern the operations of the boards of directors in a company, its executive officers, and auditing firms. The same can be said of Nigeria where a number of corporate governance reforms have been implemented that seek to enhance corporate oversight and enhance the performance of listed companies (Mensah & Bein, 2023). Codes of good corporate governance specific to sectors have been published over time, such as the Code of Corporate Governance of the Telecommunication Industry (2016), the Code of Corporate Governance of Banks and Discount Houses (2014), the Code of Corporate Governance of Public Companies (2011), the Code of Good Corporate Governance of the Insurance Industry (2009) and the Code of Corporate Governance of Licensed Fund Operators (2008). To streamline these sectoral codes and to improve uniformity in corporate governance practices, the Nigerian Code of Corporate Governance (2018) was unveiled to institutionalize best international practices in corporate governance and bolster corporate accountability and sustainability of businesses in the Nigerian firms (Abu, Okpeh and Okpeh, 2016). The Nigerian Code of Corporate Governance (2018) defines a director as a man or woman who has been elected appropriately to guide and administer the affairs of a firm by the shareholders or their representatives (Nalukenge, Ramlugun, & Soobaroyen, 2024). Board of directors

thus is something like a governing body which supervises the management and makes sure that the organization is functioning in the best interest of the shareholders. According to Garg (2022), the board of directors refers to a body of people who are appointed with the responsibility of supervising the running of a firm on behalf of shareholders and reporting on the performance of the firm at least once in every year. According to the agency theory, the board of directors is very effective in protecting the wealth of shareholders by ensuring that conflicts of interest between managers and the owners are minimized (Adesanmi et al., 2019). Board structure is the arrangement and make up of the board of directors and is deemed to be a major aspect of corporate governance. It is how the board conducts its monitoring and advisory roles, within the organization. According to Al-Dahiyat et al. (2020), board structure is the central governance layer of an organization that has a strong impact on corporate survival and performance over the long term. Board attributes including board size, board independence, and board leadership structure have been extensively employed to determine the effectiveness of corporate boards in the management of firms. Board size is considered as a significant predictor of board effectiveness since the size determines the board monitoring capacity, expertise diversification and decision quality. It is argued by Karamatzanis, Tilba, & Nikolopoulos (2026) that monitoring and decision-making can be made more effective by board size that might eventually lead to financial performance. Independence of board is another essential criterion in corporate governance as independent directors should exercise their objective judgment and efficient control over management. Kalyanaraman and Altuwaijri (2016) also note that the extent to which the board successfully monitors the management and minimizes agency issues is often determined by the degree of board independence, since outside directors usually have less personal interest in the company. CEO two (duality) is another significant dimension of board structure that takes place when a single person sits in the positions of Chief Executive Officer (CEO) and Chairman of the board. However, whereas the former scholars believe that CEO duality can increase the cohesion of leadership and the efficiency of decision-

making, other scholars think that duality undermines the independence of the board and the effectiveness of monitoring systems (Aggarwal & Varma, 2024). Effective board structures are of great concern in the context of industrial goods companies in Nigeria because this industry is capital-intensive and, therefore, contributes a lot to national economic development. The importance of industrial goods companies in the development of infrastructure, production and economy is critical. As a result, the role of board structure to financial performance in these firms has become a significant research issue. Aggarwal & Varma (2024) highlight that board characteristics are features of corporate boards that define how well it can control and manage corporate operations. Competent board arrangements enhance the chances that the finances of shareholders will be well checked by the operations of the board of directors, thus protecting the interests of the investors (Akinsola, & Taofeek, 2025). Since corporate boards play a strategic role in the governance of organizations, the study therefore seeks to determine the relationship between the variables of board structure used, including board size, board independence and the CEO duality and the financial performance of listed industrial goods companies in Nigeria. Financial performance in this analysis has been determined by the use of Return on Investment (ROI), which is the effectiveness of the firms in using their resources to realize returns to the shareholders. Corporate governance has also been raised as a significant concern in the contemporary organizations because it helps to establish accountability, transparency and enhancement of the performance of firms. The key component of corporate governance is the board of directors, which oversees the activities conducted by the management and will make sure that corporate resources are well used in the interest of shareholders and other stakeholders. Board structure, therefore, board size, board independence, and leadership structure have been the most investigated with respect to firm financial performance. Although there is increasing literature on board structure and firm performance, the empirical evidence on this topic is still conflicting. The studies have identified a negative relationship of board size to the performance of firms (Benvolio and Ironkwe, 2022), as well as positive or

non-significant (Mohammed and Kurawa, 2021; Sanni et al., 2020). Other attributes of boards have yielded similar mixed outcomes in other sectors and even countries. Such contradictory results imply that the correlation between board structure and financial performance is not quite conclusive and it is subject to further empirical research. The other issue of high concern is that the majority of the existing research in Nigeria has concentrated on banking and insurance sectors with very little information assigned to the industrial goods sector. Despite the fact that Korolo (2023) explored corporate governance characteristics of mentioned companies listed in the industrial goods sector, the research did not exhaust the essential variables of board structure like CEO duality that could drive financial performance. Given the strategic significance and high capital nature of the industrial goods firms, there is need to look deeper into the management practices of this industry. In addition, a significant number of past studies have relied mostly on accounting-based performance measures like Return on Assets (ROA), and Return on Equity (ROE) to gauge the performance of firms (Ilo et al., 2025; Nwankwo and Uguru, 2022; Musah and Adutwumwaa, 2021). Nonetheless, the Return on Investment (ROI) has not received much emphasis, as it determines the efficiency with which firms make usage of the invested capital to obtain returns. This leaves a gap in the relationship between the structure of boards and financial performance in the case of ROI as a performance measure. Given these gaps and other inconsistencies in the literature, this research is thus aimed at studying the impact of board structure Board size, board independence, and CEO duality on the financial performance of listed Nigerian industrial goods companies with Return on Investment (ROI).

2 LITERATURE REVIEW

2.1 Board Characteristics

Udoh (2022) defined boards as the internal governing mechanism that shapes firm governance, given their direct access to the two other aspects of the corporate governance triangle which are managers and shareholders. In addition, Vitolla,

Raimo, Marrone, & Rubino, (2020) showed that the composition of board structure is an important component due to the presence of non-executive directors which represents a method of monitoring the actions of the executive directors and of ensuring that the executive directors pursue the firm's policies that are consistent with shareholders' interests. In effect, the board of directors is now seen as a target of blame for corporate misdeeds and also as a source capable of improving corporate governance. Much of the capacity in solving the excess power within firms has been assigned to the board of directors with a specific need for non-executive directors to help increase executive accountability. Board characteristics refer to features that can be used to measure the effectiveness and efficiency of corporate boards that are tasked with overall management of the firm. It is important to ensure good management system which is essential for good financial performance and have been widely recognized as an important corporate governance mechanism for aligning the interests of managers and all stakeholders to a firm. Effective board characteristics enhance the likelihood that owners of capital would be able to monitor the activities of the managers either directly through voting on crucial matters or indirectly through the board of directors; which invariably would protect shareholders' investment (Yusoff et al, 2018). In this study, the characteristics of board of directors that were studied include board size, independence, and gender diversity. Brief explanation about board characteristics is given below in order to improve understanding of the variables of interest to this study

2.2 Board Size

According to Onyali and Okerekeoti (2018), the board size represents the total head counts of directors seating on the corporate board of an organization. This definition above highlights the totality narrative being absolute number of persons appointed to serve on the board of a company. It refers to the complete composition of directors either executive, non-executive, independent or either male or female. Velte (2022) further defined board size from the effectiveness perspective and not only from the head counts. He defined board size as the number of people that make up corporate board and that

determine how effective it discharges its fiduciary responsibilities. For the purpose of this study, board size can be defined as the total number of directors on the board of each sampled firm which is inclusive of the Chairman, the CEO or managing director, executive directors and non-executive directors (outside directors) in a given financial year.

2.3 Board Independence

Kapoor & Goel (2019) agree that board independence is calculated as a proportion of outside directors to entire directors in the board. García Martín & Herrero (2020) believe that boards with higher proportion promote efficient monitoring in the firm's management. Also, firms with higher ratio of nonexecutive board members have power to ensure compliance with the rules of legislative authorities and permits disclosure of financial position of the firm Abebe Zelalem, Ali Abebe, & Wodajo Bezabih (2022). The management of firm requires board with strategic vision, for effective monitoring of their operation. Many scholars have emphasized on the importance of board independence in an organization. Chintrakarn, Jiraporn, & Treepongkaruna, (2021) investigate the contributions of independent directors to shareholder value and stressed that the degree of independence and board structure determine the marginal value of independent directors. They also posit that the level of independence of the board of directors determine how effective the board would be in exercising their monitoring functions on behalf of the shareholders. For the purpose of this study, board independence can be defined as the proportion of non-executive (outside) directors, that are not actively involved in the day-to-day running of the organisation, among the board of directors of a given firm in a given financial year. As such, the board is said to be highly independent if there are more independent non-executive directors that are not associated with the top executives of the firm.

2.4 CEO Duality

The CEO has complete control over the allocation of resources and strategic choices as a result of the dual leadership structure (Firstenberg and Malkiel, 1994). Despite a stronger unity of command, the concentration of authority limits the board's ability to

supervise and rein in the CEO (Finkelstein and D'Aveni, 1994). Halioui et al. (2016) asserted that CEO duality has no impact on accrual earnings management and financial aggression in the USA and the UK. However, the association between CEO dualism and profits manipulation is not conclusive, according to Lai and Tam (2017) and Yasser, & Mamun (2016). Lewellyn and Fainshmidt (2017) pointed out that there are other sources of CEO power, including as voting, expert, and information power, and that CEO power is not only determined by the structural power by CEO duality. Thus, the financial performance or aggression are only slightly influenced by the leadership structure. The chairman oversees and evaluates the directors, including the CEO, whereas the CEO is in charge of strategic planning and policy choices. Due to the CEO's dual duty as chairman of the board, authority is consolidated within an organization (Sáenz González & Garca-Meca, 2014). As a result, combining the roles of CEO and chairman may prevent adequate supervision.

2.5 Financial Performance

Financial performance is a broad and subjective terms used in describing how well a firm can deploy its wide range of assets in generating profit or revenue. A firm can be appraised in terms of both financial (accounting measures) and market performance. Vicent (2020) see financial performance in broader sense as the degree to which financial objectives is to be achieved. It measures results of firm's financial performance and operations in monetary term, and overall financial health over a period of time. Hay (2019) defined financial performance as a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. This term is also used as a general measure of firm's financial health over a given period of time, and can be used for comparison across industries. Obonyo (2017) viewed financial performance as an evaluation of financial performance and financial strength of any business concern. Financial performance is measuring the results of firm's policies and operations in monetary terms, these results are reflected in the firm's return on investment, assets. Financial performance refers to the measurement of

the company's policies, activities and operational results in financial terms. These results are reflected in the firms return on investment, assets, assets, capital employed and financial performance. Financial performance refers to the ability of a firm to effectively utilize its resources and investments to generate profit and achieve organizational objectives. It reflects how efficiently a company manages its operations and capital to produce returns for shareholders. Financial performance can be measured using accounting-based indicators such as financial ratios or market-based measures like share price and earnings per share. For the purpose of this study, financial performance is measured using Return on Investment (ROI). ROI is an accounting-based performance indicator that measures the efficiency with which a firm utilizes its total investment to generate profit. It indicates the relationship between the returns generated and the capital invested in the business. A higher ROI suggests better utilization of resources and improved financial performance. Therefore, this study adopts ROI to evaluate how board structure variables such as board size, board independence, and CEO duality influence the financial performance of listed industrial goods companies in Nigeria (Vicent, 2020).

2.2 Theoretical Framework

2.2.1 Stakeholder Theory

Stakeholder theory explains that the success and performance of a firm depend on how well it manages the interests of all stakeholders who influence or are affected by its activities (Vitolla et al., 2019). These stakeholders include shareholders, investors, employees, customers, suppliers, government, and the public. The theory was introduced by Edward Freeman in his 1984 work *Strategic Management*, which broadened the concept of firm responsibility beyond shareholders to include other groups that contribute resources or are impacted by corporate decisions (Sari, 2023). Stakeholder theory emphasizes that organizations should balance the interests of these groups in order to achieve sustainable performance. Within the context of corporate governance, the board of directors plays a critical role in ensuring that

management acts in the best interests of stakeholders while maintaining transparency and accountability (Donaldson & Preston, 1995; Freeman, Wicks, & Parmar, 2004). Effective board structures help reduce managerial opportunism and ensure proper monitoring of corporate activities (Habbash, 2010). In relation to this study, stakeholder theory provides a useful framework for understanding how board structure influences financial performance. An effective board characterized by appropriate board size, board independence, and separation of leadership roles can enhance oversight, protect stakeholder interests, and improve the financial outcomes of firms. Therefore, the theory supports the argument that strong board structures contribute to improved financial performance, particularly in listed industrial goods companies in Nigeria.

2.2.2 Agency Theory

The agency theory is another theory adopted by this study because it deals with board characteristics which is derived from Board of Directors (BOD) being the agent of shareholders thereby creating agency relationship. Because executives are self-interested and opportunistic, and have divergent aims and risk preferences, agency theory posits that separation of ownership and control might result in a conflict of interest between management and shareholders Huu Nguyen, Thuy Doan, & Ha Nguyen, (2020). It is stated that the board of directors is an important instrument for monitoring and controlling CEOs from pursuing their own interests at the expense of the wealth of shareholders (Al Azeez, Sukoharsono, & Andayani, 2019). In order to strengthen the board's independence and successfully perform its oversight responsibility, the Agency theory proposes a large number of independent outside directors on the board and separation of the Chief Executive Officer (CEO) and Chairperson of the Board (COB) responsibilities.

2.3 Empirical Review

Ilo, Uwaleke, and Achema, (2025) examined the effect of board structure on the financial performance of listed consumer goods firms in Nigeria, focusing on the influence of board size, board independence, and gender diversity. Panel data covering 16 firms from 2014 to 2023 were analysed using a robust

fixed effects regression model, with Return on Assets (ROA) serving as the key performance metric. The findings reveal that board size has a significant negative effect on ROA, suggesting that excessively large boards may hinder strategic decision-making and increase agency costs. Board independence demonstrates a positive and statistically significant impact on ROA, underscoring the importance of non-executive oversight in enhancing firm value. However, board gender diversity exhibits a negative but statistically insignificant effect on ROA, indicating that gender inclusion on boards, though vital for equity, may not directly influence financial outcomes in the Nigerian context. Control variables such as firm size and leverage were also examined, with leverage showing a significant negative effect on ROA. These results highlight the nuanced role that board composition plays in shaping firm performance and underscore the need for optimal board design tailored to firm-specific and contextual realities. The study recommends maintaining a board size that balances diversity with decision-making efficiency and increasing the proportion of independent directors to strengthen governance practices. It also encourages further investigation into the institutional and cultural factors that may mediate the impact of gender diversity on firm performance in emerging markets. Korolo (2023) investigates the relationship between corporate governance attributes and the financial performance of listed industrial goods companies in Nigeria. The specific objectives of the study were to determine whether corporate governance attributes – board size, board composition, and board committee have any effect on the financial performance of listed industrial goods companies in Nigeria. An ex-post facto research design was used. The study used secondary data from the financial statements and annual reports of the quoted industrial goods companies for the relevant years under consideration (2018-2022). The study, which uses the panel least square regression technique, discovered that the return on assets of listed industrial goods companies in Nigeria is not significantly impacted by the size of the board. The make-up of the board significantly improves the return on assets of Nigerian-listed industrial goods businesses. However, it was discovered that the board committee had no

appreciable favorable impact on the return on assets. The present study shows that the financial performance of listed industrial goods businesses in Nigeria is positively impacted by corporate governance. The study concluded that the regulatory body should keep improving regulations that reinforce the makeup of the board of directors based on its results. A study by Benvolio and Ironkwe (2022) equally examined the impact of board compositions on firm performance but focused on the banking sub-sector. They claimed to have sampled a total of fourteen (14) quoted commercial banks in Nigeria for eleven (11) financial years of 2011 to 2021. They measure performance using market value of shares and used only two board composition (board size and board independence) variables as independent variables. Relying on the outcome of their fixed effect result, it shows that board size has a significant negative impact on firm value while board independence is positive and non-significant. They recommend a strong compliance with laid-down corporate governance principles of a higher proportion of independent directors. There are numerous ways to critique their study. Firstly, the number of listed commercial banks as at 2021 is thirteen (13) and not fourteen (14), as banks like Polaris is not listed on the Nigerian Exchange Group (NGX). Secondly, despite stating a wrong target population, one wonders where they got the data for 2021 because the banks have 90 days after year-end to release their audited reports meaning that the full 2021 financial reports of the Nigerian commercial banks are expected to be available from March 30th 2022. Thirdly, a look at their regression results showed they actually regressed 15 cross-sections for 10 periods (meaning 15 banks for 10 years) which is at variance with the wrong population and impossible time-frame (14 banks for 11 years) they claim to have studied.

Nwankwo and Uguru (2022), in their study on the impact of board characteristics on the profitability of listed service firms in Nigeria, examined the impact of board characteristics on the profitability of listed service firms. It concentrated on figuring out how board gender, the board size, and board composition affected the profitability of listed service firms in Nigeria. The ex-post facto methodology was utilized

in the study to gather secondary data from the annual reports and financial statements of a chosen group of service companies listed on the Nigerian Stock Exchange (NSE) over a ten-year period (2011 to 2020). The Generalized Method of Moment (GMM) analysis was applied to the data using ordinary least square panel regression analysis. The study found that board characteristics have strong effects on the listed service firms' profitability. In particular, board gender has a significant negative impact on the profitability of listed service firms, whereas board size and board composition have considerable significant positive effects. According to the report, the boards of the companies should grow as much as possible while still adhering to the minimum of five and maximum of fifteen member requirements of the corporate governance code of the Nigeria Securities and Exchange Commission. If they are qualified and willing to serve, both genders (men and women) should be selected for the board of directors. However, while choosing the final board size, it is always advisable to take into account the best board size in relation to the firm's operational scale and regulatory requirements. Musah and Adutwumwaa (2021), in their study on the effect of corporate governance on the financial performance of rural banks in Ghana, examined the influence of various corporate governance structures such as board size, board independence, board gender diversity, and CEO duality on the financial performance of rural banks in Ghana. The study collected secondary data from the annual reports of 30 rural banks for a 10 – year period from 2010 to 2019, which was then analyzed using descriptive statistics, a correlation matrix, and regression analysis. Their result shows a positive but statistically insignificant association between CEO duality and ROA and ROE, and a positive association between board size and ROA and ROE, as ROA was statistically insignificant. Also, board independence has a significant association with performance, and gender diversity has a negative statistically significant association with ROA and ROE. Their study recommended that rural banks should separate the CEO and board Chairperson and that rural banks have a significant proportion of their board members as non-executive directors. Simionescu, Gherghina, Tawil, and Sheikha (2021), in their study, "Does board gender

diversity affect firm performance?” investigated the effect of board gender diversity on firms’ using a sample of Standard & Poor’s 500 indexes seventy-one (71) companies from the information technology sector for the period covering 2009 to 2020. Data were analyzed using descriptive statistics, while pooled ordinary least squares (OLS) were used to test hypotheses after diagnostic tests. Through panel data, the findings show a positive effect of the number and percentage of women on corporate boards on both measures of company performance (ROA and PER). The results show no relationship between board gender diversity and ROA but a favorable effect of the number and percentage of women on board on PER after analyzing the fixed effects and random effects. In light of their findings, they proposed that governments and market regulators set gender quotas for women on boards in order to promote productivity, creativity, and innovation. Oziegbe, & Cy, (2021) board attributes and firm performance of Nigerian quoted banks with international authorization. This study population was the entire quoted banks with international authorization and a sample of eight (8) banks was analyzed for a period spanning 2014-2018. From the results of the regression analysis, it was observed that all the explanatory variables had an insignificant effect on firm performance except for board meeting, which had a significant effect on firm performance. Our findings suggest that frequency of board meetings should be encouraged as this would create opportunity for more discuss on pertinent issues that affects the survival of the firm. Another recent study by Mohammed and Kurawa (2021) also investigated how board attributes influence the value of listed insurance companies in Nigeria. They relied on a secondary data of fifteen (15) insurance firms (out of twenty-seven) from 2009-2018 (10 financial years). Distinctive from the study of Sanni (2020), they made use of dual market performance measures of market price per share and Tobin’s Q. Using the panel regression technique, their result showed that while board size has an inverse significant relationship with firm value, board gender diversity has non-significant negative impact on firm value. They recommend that “investors should pay more attention to companies with high number of directors, as provided in the NAICOM code of

corporate governance”. There is an observable conflict between their result and their recommendation because the significant negative impact of board size means that the lower the board, the higher the firm value proxies, while their recommendation advocated for higher board sizes. Their result also negates that of Sanni (2020) which found that higher board sizes increase performance, and both sampled the Insurance companies apiece. The conflicting evidence buttresses the need for further studies. Simionescu et al. (2021) investigate the influence of the board gender diversity on firms’ accounting and market-based performance using a sample of Standard & Poor’s 500 companies belonging to the information technology sector over 12 years. Using the pooled ordinary least squares (OLS) method, the outcomes provide evidence for a positive influence of women on corporate boards on both measures of company performance, except for the percentage of female executives in the case of return on assets (ROA). After estimating the fixed effects and random-effects through panel data, the findings show no statistically significant association among board gender diversity and ROA but a positive influence of the number and percentage of women on board on price-to-earnings ratio. Therefore, the empirical analyses do not lead to enough robust results to affirm that the presence of women on the board can definitely lead to better performance. A study by Ilaboya and Ashakofe (2021) investigated the relationship between board diversity and firm performance in Nigeria. They sampled a total of 15 banks from 2010-2015 and utilised secondary data. They measure performance using ROA and used board size and firm size as control variables. Using both univariate and multivariate analysis techniques, they found a negative and non-significant relationship between board nationality diversity and firm performance. Their result also showed that gender diversity has inverse negative impact on firm performance meaning that higher women in the board reduces performance; while firm size is positive and non-significant. However, their recommendation for more women inclusion in the board tend to conflict with their result that women inclusion impacts negatively on performance. Abdeljawad & Masri (2020), in his study on board characteristics and

business performance: evidence from Palestine, examined the connection between board features and return on assets. Regression analysis was used to analyze the data as the study examined businesses listed on the Palestine Exchange. Findings from the study show that the study discovered only one association, which was between the age of the organization/year of incorporation and the business's Return on Assets, after examining the independence of the board, board meetings, the board size, board expertise, company size, and year of incorporation. The study came to the conclusion that a firm's ability to analyze the genuine link with Return on Assets will depend on a number of factors, including board independence, board meetings, the board size, board expertise, company size, and year of incorporation. The recent study by Sanni (2020) examined the impact of board of directors attributes and risk management on the performance of listed Insurance companies in Nigeria between 2012 and 2017 (6 financial years). They sampled a total of twenty-six (26) Insurance firms out of a population of thirty (30). They employed the panel GLS regression method and measured financial performance using a single proxy of return on assets (ROA). The result showed that board size and board independence have positive impacts on ROA, but only board independence is statistically (howbeit, weakly) significant at 10% levels. They recommend that Insurance firms should “offer adequate diversification of insurance policy portfolio to have better premium earning that can compensate other loss when it’s occurred” (p.76). One major defect of their study is that their recommendations were not based on the findings on the board characteristics they selected.

2.4 Gap in the Literature

The empirical studies reviewed reveal that considerable research has been conducted on the relationship between board structure and firm financial performance across different sectors and countries. However, several gaps remain in the existing literature. First, many previous studies have concentrated on sectors such as banking, insurance, and consumer goods (Benvolio & Ironkwe, 2022; Mohammed & Kurawa, 2021; Ilaboya & Ashakofe, 2021; Sanni, 2020), with limited attention given to

the industrial goods sector. Although Korolo (2023) examined corporate governance attributes within listed industrial goods companies in Nigeria, the study focused mainly on board size, board composition, and board committees without incorporating other important governance variables such as CEO duality. This creates a gap in understanding how different aspects of board structure jointly influence financial performance within the industrial goods sector. Secondly, empirical findings in prior studies remain inconsistent. While some studies reported that board size negatively affects firm performance (Benvolio & Ironkwe, 2022), others found a positive or insignificant relationship (Mohammed & Kurawa, 2021; Sanni et al., 2020). Similarly, studies on board independence and other governance attributes have produced mixed results across sectors and countries. These inconsistencies may be attributed to differences in methodology, sectoral focus, time period, and measurement techniques (Pucheta-Martínez & Gallego-Álvarez, 2019). Such conflicting evidence indicates that the relationship between board structure and firm performance is still inconclusive and requires further investigation. Another notable gap relates to the measurement of financial performance. Most prior studies predominantly relied on traditional accounting measures such as Return on Assets (ROA) and Return on Equity (ROE) (Ilo et al., 2025; Nwankwo & Uguru, 2022; Musah & Adutwumwaa, 2021). However, limited studies have employed Return on Investment (ROI) as a measure of financial performance, particularly within the Nigerian industrial goods sector. Given the capital-intensive nature of industrial goods companies, ROI provides a more appropriate measure of how efficiently firms utilize invested resources to generate returns.

3. Methodology

This study adopts an ex-post facto research design, which is appropriate for examining relationships among variables using already existing data without manipulating them. The design is suitable because the study relies on historical financial and governance data of firms to determine the relationship between board structure and financial

performance. The data for the study are obtained from secondary sources, specifically the annual reports and financial statements of selected listed industrial goods companies on the Nigerian Exchange Group (NGX). The population of the study consists of all listed industrial goods companies on the Nigerian Exchange Group (NGX) as at 31st December 2024. From this population, a sample of eight (8) selected companies is drawn using purposive sampling technique, based on the availability and completeness of board structure and financial performance data in their annual reports. The study covers a period of ten (10) years from 2015 to 2024, and annual panel data are collected for analysis. The study focuses on board structure variables, specifically board size, board independence, and CEO duality, while Return on Investment (ROI) is used as the measure of financial performance. The data collected are analyzed using panel regression analysis, particularly the fixed effects estimation technique, which accounts for firm-specific characteristics that remain constant over time but may influence financial performance. The model for the study is specified as:

$$PERF_{it} = \beta_0 + \beta_1 BDS_{it} + \beta_2 BIN_{it} + \beta_3 CED_{it} + \varepsilon_{it} \dots \dots \dots 1$$

Where $PERF_{it}$ represents the Return on Investment (ROI) of firm i at time t , BDS represents board size, BIN represents board independence, and CED represents CEO duality, while ε is the error term. The model is used to determine the effect of board structure on the financial performance of listed industrial goods companies in Nigeria. In order to achieve the stated objective, two analytical techniques were employed in this study. This includes the descriptive statistics and the inferential statistics. The descriptive statistics involving the use of tables were adopted to evaluate the selected variables. The inference statistics adopted the panel data econometrics techniques involving Fixed Effect Estimation Model using EVIEWS.

4. Results and Discussion of the Findings

Interpretation of Results of Data Analysis board structure on the financial performance of listed industrial goods companies in Nigeria.

4.1 Descriptive Statistics

Table 4.1 Descriptive Statistics

	Board Size	Board Independent	CEO Duality	ROI
Mean	10.3671	0.11599	0.03798	1.1657
Median	9	0	0	0.10073
Maximum	19	1.15	1	9.3
Minimum	6	0	0	-0.2637
Std. Dev.	3.32888	0.20514	0.19236	2.94047
Skewness	0.83846	3.23667	4.83454	2.24689
Kurtosis	2.46829	15.6516	24.3728	6.07361
Jarque-Bera	10.187	664.81	1811.37	97.5689
Observations	80	80	80	80

Source: Author's computation 2026 through E-view 10

Table 4.1 presents the descriptive statistics of the variables used in examining the effect of board structure on the financial performance of listed industrial goods companies in Nigeria. The results show that the mean value of board size is 10.37, indicating that on average the firms maintain about

ten directors on their boards. The minimum board size is 6, while the maximum is 19, suggesting some variation in the size of boards across the sampled companies. The standard deviation of 3.33 indicates moderate dispersion in board size among the firms. For board independence, the mean value is 0.116, implying that independent directors constitute a relatively small proportion of the board structure in the sampled firms. The minimum value is 0, while

the maximum is 1.15, indicating variations in the level of independence across companies. The relatively low median value of 0 further suggests that many firms may have limited independent board representation. The descriptive statistics for CEO duality show a mean of 0.038, indicating that only a few firms combine the roles of Chief Executive Officer and board chairman. The maximum value of 1 suggests that CEO duality exists in some firms, but the median value of 0 indicates that the majority of companies maintain separation between the two roles, which aligns with corporate governance best practices. Regarding financial performance, measured by Return on Investment (ROI), the mean value of 1.17 indicates that on average the sampled companies generate positive returns on their

Dependent Variable: ROI

Method: Panel Least Squares

Date: 03/10/26 Time: 12:29

Sample: 2015 2024

Periods included: 10

Cross-sections included: 8

Total panel (unbalanced) observations: 80

investments. However, the minimum value of -0.26 shows that some firms experienced negative returns during the period, while the maximum value of 9.3 reflects substantial profitability for certain firms. The skewness values indicate that all variables are positively skewed, meaning that the distribution of the data is tilted toward higher values. Additionally, the Jarque-Bera statistics suggest that the variables are not normally distributed, as the probability values are significant. Overall, the table shows noticeable variability in board structure and financial performance among the listed industrial goods companies analyzed.

4.2 Regression Analysis

Table 4.2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Board Size	-0.029703	0.013316	-2.230594	0.0290
Board Independent	0.059004	0.110214	0.535363	0.5941
CEO Duality	0.010080	0.083646	0.120509	0.9044
C	1.466399	0.135573	10.81630	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.998254	Mean dependent var		1.165697
Adjusted R-squared	0.997997	S.D. dependent var		2.940474
S.E. of regression	0.131601	Akaike info criterion		-1.089549
Sum squared resid	1.177673	Schwarz criterion		-0.759626
Log likelihood	54.03720	Hannan-Quinn criter.		-0.957372
F-statistic	3887.357	Durbin-Watson stat		0.584858
Prob(F-statistic)	0.000000			

Table 4.2 presents the results of the panel least squares regression analysis examining the effect of board structure on the financial performance of listed industrial goods companies in Nigeria, with Return on Investment (ROI) used as the dependent variable.

The result shows that board size has a coefficient of -0.0297 with a probability value of 0.0290, which is statistically significant at the 5% level. This indicates that board size has a significant negative effect on ROI. This implies that an increase in the number of board members tends to reduce the financial

performance of the firms. The result suggests that excessively large boards may slow down decision-making processes and increase coordination problems, thereby negatively affecting firm performance. For board independence, the coefficient is 0.0590 with a probability value of 0.5941, which is not statistically significant. This indicates that although board independence has a positive relationship with ROI, the effect is not significant. This suggests that the presence of independent directors may contribute positively to financial performance, but their influence is not strong enough to significantly affect the ROI of the sampled industrial goods companies. Similarly, CEO duality has a coefficient of 0.0101 with a probability value of 0.9044, indicating a positive but statistically insignificant relationship with ROI. This result implies that combining the roles of the Chief Executive Officer and board chairman does not significantly influence the financial performance of the firms during the study period.

The R-squared value of 0.9983 indicates that about 99.8% of the variation in ROI is explained by the independent variables and the fixed effects in the model, suggesting a strong explanatory power of the model. The F-statistic (3887.357) with a probability value of 0.0000 indicates that the overall regression model is statistically significant.

5. Discussion of the Findings

The regression results show that board size has a significant negative effect on Return on Investment (ROI) of listed industrial goods companies in Nigeria. This finding suggests that larger boards may reduce the efficiency of decision-making and increase coordination problems, which could negatively affect firm performance. This result is consistent with the findings of Ilo, Uwaleke, and Achema (2025) who reported that board size has a significant negative effect on firm performance among listed consumer goods companies in Nigeria. Similarly, the result supports the findings of Benvolio and Ironkwe (2022) who also found that board size negatively influences firm performance. However, the result contradicts the findings of Nwankwo and Uguru (2022) and Musah and Adutwumwaa (2021) who reported a positive relationship between board size and firm

performance. The implication of this finding is that excessively large boards may reduce effectiveness in monitoring management and strategic decision-making. The result further indicates that board independence has a positive but statistically insignificant relationship with ROI. This implies that although independent directors may enhance monitoring and corporate governance practices, their presence does not significantly influence the financial performance of the sampled firms. This finding is consistent with Benvolio and Ironkwe (2022) who also reported a positive but insignificant relationship between board independence and firm performance. However, the result contradicts the findings of Ilo et al. (2025) and Musah and Adutwumwaa (2021) who found that board independence significantly improves firm performance. Finally, the result reveals that CEO duality has a positive but insignificant effect on ROI of the sampled firms. This suggests that the combination of the roles of Chief Executive Officer and board chairman does not significantly affect the financial performance of listed industrial goods companies in Nigeria. This finding aligns with the study of Musah and Adutwumwaa (2021) which also found a positive but insignificant relationship between CEO duality and firm performance. Overall, the findings indicate that while board structure plays an important role in corporate governance, only board size shows a significant influence on the financial performance of the sampled firms.

5.1 Summary of the Findings

This study examined the effect of board structure on the financial performance of listed industrial goods companies in Nigeria from 2015 to 2024, using Return on Investment (ROI) as a measure of financial performance. The findings revealed that board size has a negative and statistically significant effect on ROI, indicating that larger boards may reduce firm performance due to possible coordination and decision-making challenges. The result also showed that board independence has a positive but statistically insignificant relationship with ROI, suggesting that although independent directors may improve governance, their effect on financial performance is not significant. Similarly, CEO duality was found to have a positive but insignificant

effect on ROI, implying that combining the roles of CEO and board chairman does not significantly influence firm performance.

5.2 Conclusion and Recommendations

Based on the findings of the study, it can be concluded that board structure plays an important role in influencing the financial performance of listed industrial goods companies in Nigeria. The study revealed that board size has a significant negative effect on Return on Investment (ROI), indicating that excessively large boards may hinder effective decision-making and reduce firm performance. However, board independence and CEO duality showed positive but statistically insignificant effects on financial performance, suggesting that their influence on ROI within the study period is limited.

Recommendations

1. Industrial goods companies should maintain an optimal board size to enhance effective decision-making and improve financial performance. Excessively large boards should be avoided to reduce coordination and agency problems.
2. Companies should continue to include independent directors on their boards to strengthen corporate governance and improve monitoring of management activities.
3. Firms should carefully evaluate the practice of CEO duality, ensuring that adequate governance mechanisms are in place to maintain accountability and transparency in leadership.

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