



Effects of Capital Structure on Financial Performance of Quoted Manufacturing Firms in Nigeria

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ABSTRACT

The concept of capital structure has attracted considerable and growing attention among researchers, financial managers, policymakers, and corporate governance scholars, owing to its direct and far-reaching implications on organizational performance. Based on this backdrop, the effects of capital structure on financial performance of quoted manufacturing firms in Nigeria is therefore examined in this study. Manufacturing firms listed on the Nigerian Exchange Group as of December 31st, 2025, made up the study population. Descriptive statistics and Panel Data Regression Analysis was employed to evaluate the data collected between 2016 and 2025. The results confirmed that internal growth rate has a positive and significant effect on financial performance of quoted manufacturing firms in Nigeria; Also, it was discovered from the results that debt to equity ratio has a positive and significant effect on financial performance of quoted manufacturing firms in Nigeria; Furthermore, shareholders equity ratio has a positive and significant effect on financial performance of quoted manufacturing firms in Nigeria; In addition, the result confirmed that firm size has a positive and significant effect on financial performance of quoted manufacturing firms in Nigeria. The study concludes that approximately 81.9 percent of the variation in financial performance (Return on Assets), reflects the joint relevance of capital structure decisions of quoted manufacturing firms in Nigeria. From the findings, the study recommends that corporate managers of quoted manufacturing firms in Nigeria should prioritize the cultivation and preservation of strong internal financing capacity.

Keywords: Manufacturing firms, firm size, shareholders' equity, debt to equity ratio, internal growth rate, return on assets

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1 INTRODUCTION

The financing decision of a firm constitutes one of the most fundamental and strategic aspects of corporate financial management, representing a pivotal dimension through which organizations determine the manner in which their activities, investment projects, and growth opportunities are funded and sustained over time. As Brigham and Houston (2022) observe, the choices made in this regard shape not only the operational capacity of the firm but also its long-term trajectory in increasingly competitive and volatile market environments. Financial managers are consistently confronted with the complex challenge of selecting appropriate funding sources that will simultaneously ensure operational efficiency, maximize shareholder wealth, and support the achievement of sustainable long-term corporate growth. Every business organization, irrespective of its size, industry classification, or stage of development, requires adequate and well-structured financial resources to acquire productive assets, support day-to-day operational activities, expand production capacity, invest meaningfully in innovation and technology, and ultimately secure a durable competitive advantage in dynamic and ever-evolving market conditions.

Against this backdrop, the concept of capital structure has attracted considerable and growing attention among researchers, financial managers, policymakers, and corporate governance scholars, owing in large part to its direct and far-reaching implications for firm value and organizational performance. According to Boateng et al. (2022), capital structure represents one of the most consequential financial decisions undertaken by corporate managers, given that it profoundly influences firm profitability, risk exposure, financial sustainability, and the long-term objective of shareholder wealth maximization. The authors argue persuasively that financing decisions remain central to corporate success, as organizations continually seek an optimal combination of debt and equity instruments capable of minimizing overall financing costs while simultaneously enhancing firm value and strengthening competitive positioning in the marketplace.

To better understand and explain the complex determinants of corporate financing behaviour, several contemporary and influential theoretical frameworks have been developed over the decades. The Trade-Off Theory, one of the most widely cited frameworks in capital structure literature, posits that firms arrive at an optimal capital structure by carefully balancing the tax advantages associated with the use of debt financing against the expected costs of financial distress and potential bankruptcy that accompany rising leverage. Recent empirical reviews by Graham and Leary (2022) reaffirm the continued relevance of this framework, demonstrating that firms consistently and dynamically adjust their leverage levels in response to changes in tax regimes, shifting risk exposures, and evolving probabilities of financial distress. The Pecking Order Theory, on the other hand, offers a distinct but equally compelling perspective, suggesting that firms do not necessarily target a fixed optimal capital structure but rather follow a financing hierarchy driven by information asymmetry between managers and external investors. As Frank and Goyal (2023) explain, this hierarchy leads firms to prioritize the use of internally generated funds, resort to external debt financing when internal resources prove insufficient, and turn to equity issuance only as a last resort. This sequential financing preference implies that a firm's observed capital structure at any given point in time is largely the cumulative outcome of its historical financing decisions rather than the deliberate pursuit of an optimal leverage ratio.

Complementing these frameworks, the Agency Theory provides yet another illuminating lens through which to examine capital structure decisions, arguing that financing choices are fundamentally shaped by conflicts of interest among the principal actors in the corporate governance structure, namely managers, shareholders, and creditors. As revisited and synthesized by Harris and Raviv (2021) in their treatment of Jensen and Meckling's foundational work, capital structure serves not merely as a financing tool but also as an important governance mechanism through which agency costs arising from principal-agent conflicts can be reduced and managerial behaviour more effectively aligned with shareholder interests. Taken collectively, these theoretical perspectives provide a rich, multi-dimensional, and

comprehensive explanation of how firms design their financing structures to simultaneously enhance value creation and manage the inherent risks associated with different sources of capital.

The significance of capital structure decisions extends well beyond the theoretical domain, manifesting directly in a firm's cost of capital, profitability, liquidity position, financial risk profile, and overall corporate performance. An optimal financing mix enables firms to minimize their weighted average cost of capital, strengthen earnings capacity, enhance firm valuation in capital markets, and maintain the financial flexibility necessary to respond effectively to changing business conditions and emerging investment opportunities. Debt financing, in particular, provides notable tax advantages through the deductibility of interest payments and can meaningfully enhance returns to shareholders through the leverage effect, thereby amplifying earnings per share when the firm's return on assets exceeds the cost of debt. However, excessive and imprudent reliance on debt inevitably increases fixed financial obligations, constrains managerial discretion, and significantly heightens the risk of financial distress and potential insolvency. In contrast, equity financing enhances financial stability and substantially reduces the probability of default, although it may simultaneously lead to dilution of existing ownership interests and the entrenchment of agency-related inefficiencies arising from the separation of ownership and control (Gill, et al., 2022). The challenge confronting financial managers, therefore, lies in navigating these competing considerations to arrive at a capital structure that best serves the long-term interests of the firm and its diverse stakeholder groups.

In the manufacturing sector, capital structure decisions assume a particularly critical and strategic dimension owing to the inherently capital-intensive nature of manufacturing operations, which typically require substantial and sustained investment in plant, machinery, technology, equipment, and working capital. Financing choices between debt and equity instruments therefore bear directly and significantly upon production efficiency, technological competitiveness, operational resilience, and the long-term profitability of manufacturing enterprises. Manufacturing firms across various economies frequently face the formidable challenge of achieving and maintaining an optimal balance between the costs of financing and the broader imperative of sustainable growth, making the study of capital structure in this sector both timely and practically consequential.

In the Nigerian context, the manufacturing sector occupies a position of considerable significance in the national economy, contributing meaningfully to employment generation, industrial expansion, export earnings, and overall Gross Domestic Product. Yet, despite its strategic importance, the sector continues to grapple with persistent and multifaceted financing constraints that complicate the task of sound capital structure management. These constraints include prohibitively high bank lending rates, chronic inflationary pressures that erode real returns, exchange rate instability that amplifies the cost of imported inputs and foreign-denominated debt, pervasive infrastructural deficiencies, and severely limited access to long-term capital markets. Taken together, these structural and macroeconomic challenges render financing decisions considerably more complex for Nigerian manufacturing firms and reinforce the critical importance of selecting an appropriate capital structure capable of sustaining firm performance, ensuring financial resilience, and supporting long-term organizational survival in an uncertain and challenging operating environment.

Empirical studies examining the relationship between capital structure and firm performance have produced results that are conspicuously mixed, often contradictory, and far from conclusive. Lawal et al. (2014), for instance, reported a negative relationship between debt financing and financial performance among Nigerian manufacturing firms, suggesting that excessive leverage may constrain profitability and undermine value creation in the Nigerian manufacturing context. In sharp contrast, other studies on industrial firms operating in Nigeria have found that moderate levels of leverage actually improve profitability by harnessing the tax shield advantages of debt and enabling more efficient utilization of productive resources (Abor, 2022). Similarly, Oke and Fadaka (2021) established a statistically significant relationship between capital structure and the financial performance of consumer

goods manufacturing firms in Nigeria, although the magnitude and direction of this effect varied appreciably across different performance metrics, underscoring the important mediating role of firm-specific characteristics in determining financing outcomes. More recent empirical contributions continue to emphasize that capital structure decisions significantly influence the financial sustainability and performance trajectories of manufacturing firms in emerging economies, reinforcing the enduring relevance and practical urgency of this line of inquiry.

The persistent inconsistency in empirical findings, combined with the continuously evolving economic and regulatory environment in Nigeria, underscores the imperative need for further rigorous and contextually grounded investigation. Despite the extensive and growing body of literature on capital structure theory and its empirical applications, there remains no established consensus on the optimal financing mix capable of universally maximizing corporate performance. Some studies demonstrate that debt financing enhances firm profitability through tax advantages and leverage effects, while others contend that excessive leverage increases financial risk and ultimately diminishes firm value (Gill, et al., 2022; Frank & Goyal, 2023).

In the Nigerian manufacturing environment, firms continue to experience fluctuating profitability, escalating production costs, and persistent financing pressures despite the theoretical availability of multiple financing options. Many firms rely disproportionately on debt due to the inadequacy of internally generated funds, while others adopt equity financing as a means of reducing financial risk and enhancing balance sheet stability. Nevertheless, the precise extent to which these varied financing decisions translate into improved financial performance remains empirically uncertain and theoretically contested. Furthermore, most existing studies in the Nigerian context tend to focus narrowly on individual financing components in isolation, rather than examining the combined and interactive effects of internal financing, debt financing, equity financing, and firm size on corporate financial performance. This represents a notable and consequential gap in the extant literature, particularly given Nigeria's volatile macroeconomic environment, and thereby necessitates further systematic and comprehensive empirical investigation.

It is in response to these theoretical gaps, empirical inconsistencies, and contextual imperatives that the present study is conceived and designed. The broad objective of the study is to examine the effect of capital structure on the financial performance of quoted manufacturing firms in Nigeria, with a view to generating insights that are both theoretically grounded and practically relevant to corporate decision-makers, investors, and policymakers. The specific objectives pursued in this regard are fourfold: first, to determine the effect of internal financing on the financial performance of quoted manufacturing firms in Nigeria; second, to examine the effect of debt financing on financial performance; third, to ascertain the effect of equity financing on financial performance; and fourth, to establish the effect of firm size on the financial performance of the selected firms. In pursuit of these objectives, four null hypotheses are formulated, each positing that the respective financing variable internal financing, debt financing, equity financing, and firm size has no significant effect on the financial performance of quoted manufacturing firms in Nigeria.

The scope of the study encompasses a ten-year period spanning from 2012 to 2021, with specific focus on six prominent listed manufacturing firms, namely Nigerian Breweries Plc, Cadbury Nigeria Plc, Nestle Nigeria Plc, Dangote Cement Plc, Dangote Sugar Refinery Plc, and Flour Mills of Nigeria Plc. The study relies exclusively on secondary data sourced from the audited annual financial statements of the selected firms, ensuring the rigour, reliability, and verifiability of the empirical evidence upon which the analysis and conclusions are based.

2 LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Financial Performance (Return on Assets - ROA)

Financial performance refers to the extent to which a firm efficiently utilizes its resources to generate profit and create value for shareholders over a defined period of time. It represents a multidimensional construct that encompasses a firm's capacity to generate revenues, manage costs effectively, optimize asset deployment, and deliver sustainable returns to its various stakeholder groups. In the broadest sense, financial performance serves as a critical barometer of organizational health, reflecting the cumulative outcome of strategic decisions, operational choices, and financing arrangements made by corporate management. It is commonly measured through a range of accounting-based and market-based indicators, each of which captures a distinct dimension of firm performance and value creation. Accounting-based measures such as return on assets, return on equity, and net profit margin are particularly favoured in empirical corporate finance research due to their objectivity, verifiability, and ready availability from published financial statements. In this study, financial performance is proxied by Return on Assets (ROA), which measures the proportion of net income generated from the total assets employed by a firm during a given reporting period. ROA is widely regarded as a key accounting-based performance indicator because it reflects managerial efficiency in utilizing both current and fixed assets to generate earnings, and because it provides a holistic view of how productively the firm's entire resource base is being deployed in pursuit of profitability.

According to Brigham and Houston (2022), ROA provides a comprehensive measure of firm efficiency by linking profitability directly to the asset base, thereby revealing how effectively management deploys available resources to generate income. This linkage between earnings and assets makes ROA particularly informative for assessing the quality of managerial decision-making, since it penalizes firms that accumulate assets without generating commensurate returns. Similarly, Ross, Westerfield, and Jordan (2022) noted that ROA is a reliable indicator of operational performance because it captures the fundamental relationship between earnings and the total investment in assets, offering stakeholders a clear and interpretable signal of the firm's capacity to convert its resource base into profitable output. Damodaran (2023) further emphasized that ROA is frequently utilized in corporate finance studies because it facilitates meaningful comparisons of firms across industries regardless of capital structure differences, thereby isolating operating efficiency from the distorting effects of financial leverage. This property is particularly valuable in capital structure research, where the objective is often to disentangle the contribution of financing decisions from the underlying operational performance of the firm.

The theoretical underpinning of ROA as a performance metric is grounded in the broader principle of resource efficiency, which holds that superior firm performance is achieved when productive assets are deployed at their highest and best use. This principle aligns closely with the resource-based view of the firm, which argues that the capacity of a firm to generate sustainable returns depends fundamentally on the quality, configuration, and deployment of its internal resource endowments. From this perspective, ROA serves not merely as a financial ratio but as a proxy for the strategic effectiveness with which a firm mobilizes and leverages its asset base to sustain competitive advantage and deliver value over time. Furthermore, ROA is intimately connected to the DuPont decomposition framework, which disaggregates return on equity into its constituent components, placing ROA at the centre of the analysis as a product of net profit margin and total asset turnover. This decomposition reveals that improvements in ROA can arise either from enhanced profitability per unit of revenue or from greater efficiency in generating revenue from a given asset base, thereby providing a nuanced and diagnostically rich framework for evaluating the sources of firm performance.

High ROA is widely interpreted as an indicator of efficient asset utilization and strong managerial performance, reflecting a firm's ability to generate substantial earnings relative to its total investment in

productive resources. Conversely, low ROA suggests inefficiency in resource allocation, weak operational execution, or both, and may signal the need for strategic restructuring, cost containment, or asset rationalization. It is also important to note that ROA can be influenced by a firm's stage of development, its industry positioning, the maturity of its asset base, and the prevailing macroeconomic conditions in which it operates, all of which must be considered when interpreting cross-sectional or longitudinal variations in this measure. Empirical studies consistently confirm that ROA is sensitive to financing decisions, making it particularly appropriate for capital structure-related studies, as the choice between debt and equity financing directly affects interest expenses, tax liabilities, and net income, all of which feed into the numerator of the ROA ratio (Frank and Goyal, 2023; Berk and DeMarzo, 2022). This sensitivity reinforces the appropriateness of ROA as the dependent variable in a study examining how internal financing, debt financing, equity financing, and firm size collectively influence the financial performance of listed manufacturing firms in Nigeria, where financing conditions are shaped by unique structural and macroeconomic realities that distinguish the operating environment from those studied in developed economy contexts.

2.1.2 Internal Financing (Internal Growth Rate IGR)

Internal financing refers to the use of retained earnings and internally generated funds to finance business operations, capital expenditures, and expansion activities without recourse to external sources of capital such as debt instruments or equity issuance. It represents the most fundamental and organically rooted form of corporate financing, drawing directly upon the surplus resources that a firm accumulates through its own profitable operations over time. As a financing strategy, internal financing reflects a firm's capacity to sustain and grow its activities from within, relying on the disciplined reinvestment of earned profits rather than on the goodwill of external capital providers or the conditions prevailing in financial markets. Retained earnings, which constitute the primary component of internal financing, represent the portion of net income that remains within the firm after dividend distributions to shareholders have been made, and they accumulate on the balance sheet as a growing reservoir of self-generated financial capacity. Beyond retained earnings, internal financing may also encompass non-cash charges such as depreciation and amortization, which, while not representing actual cash inflows, effectively preserve cash within the firm by reducing taxable income without requiring a corresponding cash outflow.

In this study, internal financing is proxied by the Internal Growth Rate (IGR), which represents the maximum rate at which a firm can grow its total assets using only retained earnings and internally generated funds, while maintaining its existing financial structure and without resorting to any form of external financing. The IGR is mathematically derived as a function of the firm's return on assets and its earnings retention ratio, capturing in a single metric both the profitability of the asset base and the proportion of earnings that management chooses to reinvest in the business rather than distribute to shareholders.

IGR is an important and theoretically meaningful indicator of financial independence, operational self-sufficiency, and long-term financial sustainability. Firms endowed with higher internal growth capacity are inherently less dependent on the vagaries of external capital markets, which reduces their exposure to financing costs, market timing risks, and the restrictive covenants that frequently accompany externally sourced debt or equity. This independence from external financing not only preserves managerial discretion and strategic flexibility but also insulates the firm from the cyclical disruptions and credit market tightening that can significantly constrain the investment activities of firms that rely predominantly on external funding. According to Berk and DeMarzo (2022), internal financing enhances financial flexibility and empowers firms to undertake value-creating investment projects without increasing leverage ratios or diluting the ownership interests of existing shareholders, thereby preserving both financial stability and governance integrity. This is particularly significant in emerging

market environments such as Nigeria, where external capital markets are often shallow, transaction costs are elevated, and access to long-term financing remains structurally constrained for many manufacturing firms.

Similarly, Damodaran (2023) observed that retained earnings represent the cheapest and most accessible source of financing available to a firm because they involve neither explicit interest costs, as debt would, nor the administrative and underwriting expenses associated with new equity issuances. This cost advantage makes internal financing an especially attractive first resort for firms seeking to fund growth initiatives while preserving their financial efficiency and avoiding unnecessary value leakage through financing costs. The theoretical foundation underpinning the primacy of internal financing is most compellingly articulated within the framework of the Pecking Order Theory, originally advanced by Myers and Majluf and subsequently refined and extended by numerous scholars. This theory holds that corporate financing decisions are governed by a hierarchy of preferences rooted in the desire to minimize the costs arising from information asymmetry between well-informed corporate insiders and less-informed external investors. Because managers possess private information about the firm's true value and future prospects that is not fully available to external capital providers, any attempt to raise external financing whether through debt or equity is inevitably accompanied by adverse selection costs and signalling consequences that raise the effective cost of capital. Internal financing, by contrast, avoids these information-related frictions entirely, as it involves no engagement with external parties and therefore generates no adverse signalling.

Frank and Goyal (2023) further elaborated that firms with strong and stable internal cash flows are significantly more likely to exhibit pecking order behaviour in their financing decisions, consistently preferring internal funds over external financing precisely because of the lower information asymmetry costs involved. The inclination toward internal financing is therefore not merely a matter of cost minimization in a narrow accounting sense but reflects a deeper strategic preference for financial autonomy rooted in the desire to shield the firm from the disciplinary scrutiny and governance demands that external capital providers invariably impose.

The IGR also carries important implications for the assessment of a firm's dividend policy and its relationship with growth strategy, since the proportion of earnings retained rather than distributed determines the pool of internal capital available for reinvestment. Firms that pursue aggressive growth strategies may consciously adopt lower dividend payout ratios in order to maximize the retention of earnings and thereby enhance their internal growth capacity, while firms in mature industries with limited reinvestment opportunities may prefer to distribute a larger proportion of earnings to shareholders. This interplay between dividend policy, earnings retention, and internal financing capacity underscores the importance of viewing the IGR not in isolation but as an integrated component of the firm's broader financial strategy. Consequently, IGR reflects the overall financial strength of a firm in generating sustainable internal resources for growth and expansion, serving as a meaningful proxy for the depth and resilience of the firm's self-financing capability. In the context of Nigerian listed manufacturing firms, where persistent financing constraints and high borrowing costs make external financing both expensive and unreliable, the ability to generate and retain sufficient internal resources assumes a particularly strategic significance, as it determines the extent to which firms can pursue growth and maintain operational continuity independently of volatile and often prohibitively costly external capital markets.

2.1.3 Debt Financing (Debt to Equity Ratio – DER)

Debt financing refers to the use of borrowed funds, sourced from external creditors and financial institutions, to finance corporate operations, capital investments, asset acquisition, and business expansion activities. It represents one of the two primary pillars of corporate capital structure and has been the subject of extensive theoretical and empirical inquiry in the corporate finance literature, owing

to its dual capacity to simultaneously amplify returns and escalate financial risk. Debt instruments through which firms access borrowed capital take various forms, including bank loans, corporate bonds, debentures, commercial paper, and other credit facilities, each carrying distinct maturity profiles, interest obligations, and covenant structures that shape the firm's financial flexibility and strategic options. Unlike equity financing, which confers ownership rights and exposes shareholders to residual risk, debt financing creates fixed contractual obligations that must be honoured regardless of the firm's operational performance, thereby introducing a dimension of financial rigidity that becomes increasingly consequential as leverage levels rise.

In this study, debt financing is proxied by the Debt to Equity Ratio (DER), which measures the proportion of total debt relative to shareholders' equity in the firm's capital structure. As a financial leverage indicator, DER reflects the degree to which a firm relies on external borrowing relative to internally contributed ownership capital, and it provides a direct and intuitive measure of the firm's financial risk exposure, creditor dependence, and the structural balance between debt and equity in its overall financing architecture. A higher DER implies greater reliance on debt financing, which may enhance returns to shareholders through leverage effects when the return on invested capital exceeds the cost of debt, but which simultaneously increases fixed financial obligations, narrows managerial discretion, and amplifies the firm's vulnerability to financial distress in periods of earnings volatility or economic downturn.

The concept of financial leverage, captured meaningfully by DER, operates as a double-edged instrument in corporate finance: it magnifies profitability gains when business conditions are favourable but equally magnifies losses and financial strain when operating performance deteriorates below expectations (Modigliani and Miller, 1963). This inherent duality makes the management of leverage ratios a central preoccupation of corporate financial managers across all industries and economic environments. According to Hillier, Clacher, Ross, Westerfield, and Jordan (2022), debt financing can meaningfully improve firm performance when deployed optimally, principally due to the tax deductibility of interest payments, which effectively reduces the firm's tax burden and lowers the overall cost of capital relative to an all-equity financing structure. This tax shield benefit, first formally articulated in the seminal work of Modigliani and Miller (1958, 1963), constitutes one of the most powerful theoretical rationales for the use of debt in corporate capital structures and continues to exert a significant influence on financing decisions across firms and industries. However, Hillier et al. (2022) equally caution that excessive debt accumulation erodes these benefits by increasing bankruptcy risk and imposing substantial financial distress costs that can quickly outweigh the tax advantages of leverage, particularly when earnings become uncertain or interest coverage ratios decline to critical levels.

The theoretical framework most directly relevant to understanding the relationship between debt financing and firm performance is the Trade-Off Theory of capital structure, which posits that firms determine their optimal leverage by systematically weighing the marginal tax benefits of additional debt against the marginal costs of financial distress associated with increasing leverage. Myers (2023) elaborates persuasively that firms make leverage decisions through this balancing act, continuously seeking the leverage ratio at which the present value of tax shield benefits is exactly offset by the present value of expected financial distress costs, thereby arriving at a theoretically optimal capital structure that maximizes firm value. This framework implies that there exists an interior optimal leverage ratio for each firm, determined by its unique tax position, earnings volatility, asset tangibility, and growth opportunities, beyond which further increases in debt reduce rather than enhance firm value.

Complementing this perspective, Jensen and Meckling (1976), as revisited in more contemporary treatments by Harris and Raviv (2021), argued that debt also serves a disciplinary function within the firm, constraining managerial discretion and reducing the tendency toward free cash flow misallocation by imposing binding repayment obligations that effectively bond management to deliver operational

efficiency and shareholder value. This agency-theoretic rationale for debt provides an additional dimension through which DER can be understood as a governance mechanism rather than merely a financing tool, reinforcing the multifaceted significance of leverage in shaping firm performance outcomes.

Ross et al. (2022) further observed that leverage influences both the profitability and risk exposure of the firm in simultaneous and interconnected ways, making it a critical and multidimensional determinant of overall firm performance that cannot be reduced to a simple linear relationship. The interaction between leverage and profitability is further complicated by the role of firm-specific factors such as asset tangibility, business risk, industry dynamics, and macroeconomic conditions, all of which moderate the extent to which debt financing translates into improved or diminished financial outcomes (Frank and Goyal, 2023). Titman and Wessels (1988), whose foundational empirical work on the determinants of capital structure continues to be widely cited, demonstrated that leverage is systematically related to firm characteristics including size, profitability, asset structure, and growth opportunities, reinforcing the view that optimal debt levels are not universally applicable but are contingent upon the specific circumstances of individual firms and their operating environments.

In the Nigerian manufacturing context, where borrowing costs are typically high, credit availability is often restricted, and macroeconomic volatility amplifies the risks associated with fixed debt obligations, the management of DER assumes a particularly consequential strategic dimension. Firms that fail to calibrate their leverage appropriately risk being caught in a debt trap where rising interest obligations erode profitability, reduce investment capacity, and ultimately threaten operational continuity (Abor, 2022; Oke and Fadaka, 2021). Thus, DER captures not only the degree of financial risk and external funding dependence within individual firms but also serves as a meaningful barometer of the strategic sophistication with which management navigates the complex trade-offs inherent in corporate financing decisions within challenging and resource-constrained emerging market environments.

2.1.4 Equity Financing (Shareholders' Equity Ratio – SER)

Equity financing refers to the use of shareholders' funds, comprising paid-up share capital, share premium reserves, retained earnings, and other components of owners' equity, to finance corporate assets, operational activities, and long-term investment undertakings. It represents the foundational ownership layer of the firm's capital structure and embodies the residual claim that shareholders hold over the firm's assets and earnings after all debt obligations have been settled. As a financing modality, equity occupies a fundamentally distinct position from debt, not only in its legal and contractual characteristics but also in the risk and return dynamics it creates for both the firm and its investors. Equity providers, unlike creditors, do not enjoy fixed contractual payments or priority claims in liquidation; instead, they bear the full residual risk of the firm's performance in exchange for the potential of unlimited upside participation in its value creation. This risk-bearing arrangement means that equity financing imposes no mandatory cash outflow obligations on the firm in periods of poor performance, thereby providing a crucial buffer of financial flexibility that preserves the firm's capacity to weather adverse economic conditions without triggering default or insolvency.

Equity capital may be raised through various channels, including the issuance of ordinary shares in initial public offerings or seasoned equity offerings, the accumulation of retained profits over successive operating periods, contributions from venture capitalists or private equity investors, and rights issues offered to existing shareholders. In this study, equity financing is proxied by the Shareholders' Equity Ratio (SER), which measures the proportion of total assets that is financed by owners' equity rather than by borrowed funds. As a structural indicator of the firm's financing composition, SER reflects the financial strength, capital adequacy, and ownership structure of the firm, providing a direct and interpretable measure of the degree to which the firm's asset base is supported by

internally contributed and risk-absorbing ownership capital as opposed to externally sourced and contractually obligated debt.

A higher SER indicates a stronger and more resilient capital base, reduced reliance on external borrowing, and correspondingly lower exposure to the financial risks associated with leverage, including interest rate sensitivity, refinancing risk, and the threat of financial distress in periods of earnings volatility. Firms with elevated equity ratios are structurally positioned to absorb operational shocks and economic downturns more effectively than their highly leveraged counterparts, as the absence of mandatory debt service obligations provides greater managerial latitude to redirect cash flows toward strategic priorities such as capital investment, research and development, and market expansion (Berk and DeMarzo, 2022).

According to Titman and Keown (2022), equity financing meaningfully enhances financial stability and long-term solvency by reducing the firm's dependence on creditor goodwill and the availability of credit markets, thereby insulating corporate strategy from the cyclical fluctuations and tightening conditions that characterize external lending environments. However, Titman and Keown (2022) equally acknowledge that equity financing is not without its costs and limitations, noting in particular that the issuance of new equity shares can lead to the dilution of existing ownership interests, a reduction in earnings per share, and the potential weakening of incumbent shareholders' control over corporate governance and strategic direction. This dilution effect represents a significant concern for existing shareholders, particularly in contexts where the firm's shares may be issued at prices that undervalue intrinsic worth, resulting in a wealth transfer from existing to incoming shareholders that corporate managers must navigate with considerable care and transparency.

Ross et al. (2022) further elaborated that firms maintaining higher proportions of equity in their capital structures are demonstrably less vulnerable to financial distress and economic shocks, as the absence of fixed debt obligations substantially reduces the probability of default and the associated deadweight losses of bankruptcy, including legal costs, reputational damage, and the disruption of productive business relationships with customers, suppliers, and employees. This reduced vulnerability translates directly into greater strategic resilience and long-term survival capacity, particularly in volatile and unpredictable operating environments such as that characterizing Nigeria's manufacturing sector, where macroeconomic instability, inflationary pressures, and exchange rate volatility can rapidly and severely erode firm-level cash flows. Graham and Leary (2022) similarly found that firms operating in industries characterized by high earnings volatility and substantial asset intangibility tend to rely more heavily on equity financing as a means of managing financial risk, since the flexibility of equity capital allows them to absorb cyclical downturns without triggering the covenant violations and creditor interventions that accompany excessive leverage.

Furthermore, the signaling theory of capital structure, as developed by Myers and Majluf (1984) and subsequently extended by numerous scholars, suggests that a firm's decision to issue equity carries informational content for external observers, with equity issuance sometimes interpreted by the market as a signal that management believes the firm's shares are overvalued, potentially leading to adverse price reactions that increase the effective cost of equity capital (Frank and Goyal, 2023). This signalling dimension adds a layer of strategic complexity to equity financing decisions that goes beyond simple cost comparisons with debt.

Brigham and Houston (2022) also observed that while equity financing is widely regarded as a safer and more financially conservative source of capital from a solvency perspective, it is paradoxically more expensive than debt financing in terms of the required rate of return demanded by equity investors. This higher cost of equity arises from the greater risk borne by shareholders relative to creditors, since equity holders occupy the most subordinate position in the firm's claim hierarchy and must therefore be compensated with a commensurately higher expected return to justify their investment. Damodaran (2023) reinforced this point by demonstrating that the cost of equity, typically estimated using

frameworks such as the Capital Asset Pricing Model or the dividend discount model, invariably exceeds the pre-tax cost of debt for most firms, implying that over-reliance on equity financing, while reducing financial risk, may simultaneously raise the firm's weighted average cost of capital and thereby reduce overall firm value if the tax shield benefits of debt are forgone.

Modigliani and Miller (1963) had earlier established this foundational insight, demonstrating that in a world with corporate taxes, the optimal capital structure is not one of pure equity but rather one that incorporates a judicious level of debt sufficient to capture available tax shield benefits without exposing the firm to unacceptable levels of financial distress risk. Pandey (2021) further noted that the optimal equity ratio for any given firm is therefore not a universal constant but a firm-specific outcome determined by the interaction of its tax environment, profitability, growth opportunities, asset structure, and the risk tolerance of its shareholder base. Therefore, SER serves as an important and multifaceted indicator of financial stability, capital adequacy, and long-term solvency, capturing in a single ratio the fundamental orientation of the firm's financing strategy and its implications for risk, cost of capital, and value creation. In the specific context of Nigerian listed manufacturing firms, where access to affordable long-term debt remains structurally limited and equity markets are gradually deepening, understanding the role of SER in determining financial performance offers critical insights for corporate managers, investors, and policymakers seeking to foster more resilient and sustainably financed industrial enterprises.

2.1.5 Firm Size (Logarithm of Total Assets – LTA)

Firm size refers to the scale of a company's operations, resource base, market presence, and overall organizational capacity, and it represents one of the most consistently examined and theoretically significant firm-level characteristics in the corporate finance and strategic management literatures. As a fundamental attribute of organizational identity, firm size shapes virtually every dimension of corporate behaviour, from financing decisions and investment strategies to competitive positioning, governance structures, and risk management practices. The concept of firm size is inherently multidimensional, and scholars have operationalized it using a variety of proxies depending on the research context and the specific dimension of scale under examination. Common measures include total assets, total sales revenue, market capitalization, number of employees, and book value of equity, each of which captures a slightly different aspect of organizational scale and carries distinct advantages and limitations as a research instrument.

Total assets, in particular, have emerged as one of the most widely adopted and theoretically grounded measures of firm size in empirical corporate finance research, as they provide a comprehensive and balance-sheet-anchored representation of the cumulative resource base that the firm has assembled and deployed over its operational history. In this study, firm size is proxied by the Logarithm of Total Assets (LTA), which captures the natural logarithm of the total assets held by a firm at the end of each reporting period. The application of the logarithmic transformation to raw asset values is a well-established methodological convention in corporate finance research, serving the dual purpose of normalizing the distribution of asset values across firms of vastly different scales and substantially reducing the positive skewness and heteroscedasticity that typically characterize raw financial data, thereby improving the statistical properties of regression estimates and enhancing the reliability and interpretability of empirical findings (Wooldridge, 2020).

Larger firms are generally expected to enjoy a range of structural and competitive advantages that translate directly into superior financial performance and more favourable financing conditions relative to their smaller counterparts. These advantages are rooted in the economics of scale and scope, the reputational capital accumulated through sustained market presence, and the institutional relationships cultivated over extended periods of engagement with lenders, investors, regulators, and other key stakeholders. According to Frank and Goyal (2023), firm size is one of the most consistent

and robust determinants of capital structure across different economies, industries, and time periods, because large firms are typically more operationally diversified, possess more stable and predictable cash flow streams, and present a lower risk profile to external capital providers than smaller, more concentrated enterprises. This lower perceived risk translates directly into improved access to a broader range of financing instruments, more favourable borrowing terms, and reduced costs of capital that collectively enhance the financial flexibility and strategic optionality available to larger firms.

Rajan and Zingales (1995), whose landmark empirical study of capital structure determinants across major industrialized economies remains foundational to the field, identified firm size as one of four core determinants of leverage, demonstrating that larger firms consistently carry higher leverage ratios, a finding attributed to their greater debt capacity, lower bankruptcy probability, and reduced information asymmetry with capital market participants. Pandey (2022) similarly observed that large firms enjoy stronger bargaining power with lenders, reflecting their ability to negotiate more competitive interest rates, longer repayment tenors, and less restrictive loan covenants than smaller borrowers can typically secure, a structural advantage that significantly reduces the overall cost and rigidity of external financing.

The relationship between firm size and access to capital markets is further mediated by the role of information asymmetry, a concept central to both the Pecking Order Theory and the signalling literature in corporate finance. Smaller firms tend to suffer from more severe information asymmetry problems relative to larger firms, as the latter benefit from greater analyst coverage, more extensive public disclosure requirements, longer track records of financial performance, and more established reputations among institutional investors and credit rating agencies (Myers and Majluf, 1984; Frank and Goyal, 2023). This informational advantage reduces the adverse selection costs that large firms face when accessing external capital markets, enabling them to issue debt or equity at more favourable prices and with lower transaction costs than their smaller counterparts.

Fama and French (2022) corroborated this view by demonstrating that firm size is systematically associated with risk-adjusted returns in equity markets, with smaller firms carrying higher systematic risk premiums that reflect their greater exposure to financial distress, liquidity constraints, and macroeconomic shocks. The implication for capital structure research is that firm size moderates the relationship between financing decisions and firm performance, as the structural advantages enjoyed by larger firms enable them to extract greater value from a given financing arrangement than smaller firms operating under more constrained and costly conditions.

Berk and DeMarzo (2022) further elaborated that firm size influences profitability not only through differential access to capital but also through the operational efficiency gains, market dominance, and reduced unit costs of production that accompany larger organizational scale. Economies of scale, which arise when average costs decline as output volume increases, allow larger firms to achieve superior cost structures that enhance profit margins and strengthen competitive positioning relative to smaller rivals. Economies of scope, similarly, enable large diversified firms to spread fixed costs across a broader range of products and markets, further reducing per-unit production and distribution costs and enhancing overall financial performance. Penrose (1959), whose theory of the growth of the firm laid the intellectual groundwork for understanding how organizational size and resource accumulation interact to generate competitive advantage, argued that larger firms possess richer and more heterogeneous internal resource endowments that can be recombined and redeployed across a wider range of productive applications, generating superior returns relative to more resource-constrained smaller firms.

More recently, Dang, Li, and Yang (2022) offered a comprehensive comparative analysis of firm size measures in empirical corporate finance, concluding that total assets, particularly when logarithmically transformed, provide the most stable and theoretically consistent measure of firm size across different research designs and sample compositions, reinforcing the methodological

appropriateness of LTA as the chosen proxy in the present study. Zeitun and Tian (2022) further demonstrated that firm size exerts a significant and positive influence on financial performance among listed firms in emerging markets, attributing this effect to the superior resource mobilization capacity, institutional credibility, and operational resilience of larger enterprises in environments characterized by underdeveloped financial markets and heightened macroeconomic uncertainty. Therefore, LTA serves as a theoretically grounded, methodologically robust, and empirically validated proxy for operational scale and financial capacity in capital structure studies, capturing in a single normalized measure the far-reaching implications of organizational size for financing behaviour, cost efficiency, market positioning, and ultimately the financial performance of listed manufacturing firms in the Nigerian economic environment.

2.2 Theoretical Review

2.2.1 Pecking Order Theory

The theoretical framework underpinning this study is the Pecking Order Theory, originally formulated by Myers and Majluf (1984) and further developed by Myers (1984). The theory posits that corporate financing decisions are governed by a hierarchical ordering of financing preferences designed to minimize costs arising from information asymmetry between corporate insiders and external investors. Firms first utilize internally generated funds, principally retained earnings, before resorting to debt financing, and turn to equity issuance only as a last resort when internal funds and debt capacity have been fully exhausted. Internal financing is preferred because it involves no engagement with external capital markets and generates neither adverse selection costs nor signalling consequences. Debt is preferred over equity because it carries a smaller informational disadvantage, while equity issuance signals potential overvaluation and triggers adverse market reactions that raise the effective cost of new capital (Ma and Jin, 2024).

The Pecking Order Theory is adopted as the singular theoretical anchor of this study principally because of its unparalleled capacity to simultaneously and coherently accommodate all four independent variables. The theory's financing hierarchy, progressing sequentially from internal financing through debt to equity, maps directly and precisely onto the Internal Growth Rate, Debt to Equity Ratio, Shareholders' Equity Ratio, and firm size variables examined in this study. Mukherjee and Wang (2024) affirmed that the Pecking Order Theory remains the most comprehensive single framework for explaining financing behaviour across multiple financing tiers, particularly where internal financing, leverage, and equity composition are examined concurrently as determinants of firm performance. No alternative capital structure theory, including the Trade-Off Theory or Agency Theory, achieves this degree of simultaneous theoretical correspondence with the study's complete variable structure.

The contextual alignment between the theory and the Nigerian manufacturing environment further reinforces its adoption. The Pecking Order Theory was developed to explain financing behaviour under conditions of pronounced information asymmetry, underdeveloped capital markets, elevated borrowing costs, and restricted access to long-term institutional financing, all of which are enduring structural features of the Nigerian economic landscape. Nigerian manufacturing firms operate in an environment characterized by prohibitively high lending rates, shallow equity markets, weak investor protection, and pervasive information asymmetry, conditions that consistently produce financing behaviour conforming to pecking order predictions (Adewale and Rasheed, 2024). Additionally, the theory coherently explains the role of firm size within the study's framework, as larger firms generate more stable internal cash flows, accumulate greater retained earnings, and benefit from reduced information asymmetry, all of which enhance adherence to the pecking order financing hierarchy (Frank and Goyal, 2023).

The theory equally enjoys robust empirical support in emerging market contexts comparable to Nigeria. Lemmon and Zender (2022) demonstrated that pecking order behaviour is most pronounced

among firms facing binding financing constraints and severe information asymmetry, while Wahab and Ramli (2024) confirmed that the Pecking Order Theory consistently outperforms alternative capital structure frameworks in explaining financing behaviour among manufacturing firms in emerging economies where capital market development remains limited. This convergence of theoretical relevance, contextual appropriateness, variable correspondence, and empirical validation firmly establishes the Pecking Order Theory as the most rigorous and analytically powerful theoretical anchor for this study.

3 METHODOLOGY

This study adopts a quantitative longitudinal research design to examine the effect of capital structure on the financial performance of quoted manufacturing firms in Nigeria. The design involves the systematic analysis of numerical data extracted from the annual financial statements of the same firms over multiple years, enabling the study to capture variations in internal financing, debt financing, equity financing, and firm size across the observation period. The study covers a ten-year period from 2012 to 2021 and focuses on six quoted manufacturing firms listed on the Nigerian Exchange Group, namely Nigerian Breweries Plc, Cadbury Nigeria Plc, Nestle Nigeria Plc, Dangote Cement Plc, Dangote Sugar Refinery Plc, and Flour Mills of Nigeria Plc. Secondary data were sourced exclusively from the audited annual financial statements of the selected firms. The study employed panel data regression analysis, correlation tests, and descriptive statistical techniques to examine patterns and causal relationships among the variables. Robustness and validity of results were confirmed through diagnostic assessments including the Variance Inflation Factor analysis for multicollinearity, tests for heteroskedasticity, and the Hausman specification test to determine the appropriate panel estimation technique between fixed and random effects models.

This study adapts the model proposed by Zeitun and Saleh (2023) to examine the effect of capital structure on the financial performance of quoted manufacturing firms in Nigeria, refining it to reflect the institutional, structural, and macroeconomic realities of the Nigerian manufacturing environment. Grounded in the Pecking Order Theory of Myers and Majluf (1984), the model recognizes that firms' financing decisions are hierarchically ordered in response to information asymmetry and financing costs, such that the preference for internal financing over debt and equity is shaped by the desire to minimize capital costs, with direct implications for financial performance outcomes.

The original model was put in simple linear form as follows:

$$ROA_{it} = \beta_0 + \beta_1 TDR_{it} + \beta_2 STDR_{it} + \beta_3 LTDR_{it} + \beta_4 SIZE_{it} + \beta_5 GROW_{it} + \epsilon_{it}$$

Where: ROA = Return on Assets; TDR = Total Debt Ratio; STDR = Short-Term Debt Ratio; LTDR = Long-Term Debt Ratio; SIZE = Firm Size; GROW = Firm Growth.

The variables employed within this investigation are chosen based on strong theoretical grounding in the Pecking Order framework and contextual appropriateness for the Nigerian manufacturing environment, allowing for a more precise examination of the linkage between capital structure decisions and financial performance outcomes among quoted manufacturing firms. Several deliberate and theoretically justified modifications are introduced to the original model of Zeitun and Saleh (2023) to better align it with the specific objectives, theoretical anchor, and empirical context of the present study.

The retention of Return on Assets (ROA) as the dependent variable is supported by methodological and conceptual considerations. ROA offers a broader and more comprehensive indicator of financial performance because it assesses how effectively a firm employs its entire asset base to generate profit, avoiding distortions that arise from variations in financial leverage across firms. This is particularly relevant in the Nigerian manufacturing context, where debt structures differ considerably across sampled firms (Damodaran, 2023).

The decomposition of debt into Total Debt Ratio, Short-Term Debt Ratio, and Long-Term Debt Ratio in the original model is consolidated in the present study into a single Debt to Equity Ratio, which more parsimoniously captures the overall leverage position of the firm consistent with the Pecking Order framework. Internal financing, proxied by the Internal Growth Rate, is introduced as an independent variable to capture the apex tier of the pecking order financing hierarchy, recognizing that internally generated funds constitute the most preferred and least costly source of capital available to the firm (Myers and Majluf, 1984). Equity Financing, proxied by the Shareholders' Equity Ratio, is equally introduced to capture the residual and last-resort tier of the financing hierarchy, reflecting the extent to which firm assets are financed through ownership capital. Finally, Firm Growth is replaced with Firm Size, proxied by the Logarithm of Total Assets, which more directly captures the scale-related advantages and information asymmetry reduction effects that the Pecking Order Theory identifies as key determinants of financing behaviour and performance outcomes (Frank and Goyal, 2023).

Thus, below is the study model with the linear representation:

$$FP = f(CS) \dots\dots\dots (1)$$

$$ROA = f(IGR, DER, SER, LTA) \dots\dots\dots (2)$$

The model for econometrics will be:

$$ROA_{it} = \beta_0 + \beta_1 IGR_{it} + \beta_2 DER_{it} + \beta_3 SER_{it} + \beta_4 LTA_{it} + \varepsilon_{it} \dots\dots\dots (3)$$

Where:

ROA = Return on Assets,

IGR = Internal Growth Rate (proxy for Internal Financing),

DER = Debt to Equity Ratio (proxy for Debt Financing),

SER = Shareholders' Equity Ratio (proxy for Equity Financing),

LTA = Logarithm of Total Assets (proxy for Firm Size),

i = company,

t = time,

ε = error term,

β_0 = constant/intercept,

$\beta_1 - \beta_4$ = slopes of the independent variables.

The researcher's a priori expectation based on extant literature and the theoretical predictions of the Pecking Order Theory is as follows: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$.

This expectation implies that internal financing, debt financing, equity financing, and firm size are each anticipated to exert a positive and significant effect on the return on assets of quoted manufacturing firms in Nigeria. Firms with greater internal financing capacity are expected to exhibit superior profitability by virtue of reduced dependence on costly external capital; moderate debt financing is anticipated to enhance returns through tax shield benefits and leverage effects; higher equity ratios are expected to strengthen financial stability and support sustained profitability; and larger firm size is anticipated to translate into superior financial performance through economies of scale, improved market access, and reduced information asymmetry (Frank and Goyal, 2023; Berk and DeMarzo, 2022; Damodaran, 2023). The variables employed in this study are selected on the basis of strong theoretical grounding, empirical precedent, and contextual appropriateness for the Nigerian manufacturing environment.

Table 3.1: Measurement of Variable

S/N	Variable	Description	Measurement	Source
1	Return on Assets (ROA)	Indicator of how profitable a firm is relative to its total asset base	Net income divided by total assets, expressed as a percentage	Damodaran (2023); Brigham and Houston (2022)
2	Internal Financing (IF)	Use of retained earnings and internally generated funds to finance firm growth	Internal Growth Rate: $(ROA \times \text{Retention Ratio}) / (1 - ROA \times \text{Retention Ratio})$	Berk and DeMarzo (2022); Frank and Goyal (2023)
3	Debt Financing (DF)	Use of borrowed funds to finance corporate operations and investments	Debt to Equity Ratio: Total Debt divided by Total Shareholders' Equity	Myers (2023); Ross et al. (2022)
4	Equity Financing (EF)	Use of shareholders' funds to finance corporate assets and operations	Shareholders' Equity Ratio: Total Shareholders' Equity divided by Total Assets	Titman and Keown (2022); Brigham and Houston (2022)
5	Firm Size (FS)	Scale of a firm's operations and resource base	Natural Logarithm of Total Assets	Frank and Goyal (2023); Dang, Li and Yang (2022)

Source: Researcher's Compilation (2026)

4 DATA ANALYSIS

4.1 Data Analysis

4.1.1 Descriptive Statistics

The data used for this study include returns on asset (ROA), internal growth rate (IGR), debt to equity ratio (DER), shareholders equity ratio (SER) and logarithm of total asset (LTA) for six listed companies which include Nigerian Breweries, Cadbury Nigeria Plc, Nestle Nigeria Plc, Dangote Cement Plc, Dangote Sugar Refinery Plc and Flour Mill of Nigeria Plc. ROA, IGR, DER, SER and LTA were available from 2016 to 2025 for each of the six listed and selected listed companies. The summary statistics of these variables are provided in table 4.1 showing the averages and medians, along with maximum and minimum values recorded for the period.

Table 4.1: Summary Statistics of the Variables

	DER	IGR	ROA	SER	LTA
Mean	1.733347	0.323323	0.974821	0.420733	7.710580
Median	1.254687	0.289195	0.911642	0.439392	8.088995
Maximum	13.51190	1.047888	1.979451	0.652385	8.925932
Minimum	0.297304	0.041237	0.410348	0.068909	5.080778
Std. Dev.	1.907772	0.188481	0.357074	0.125439	1.067660
Skewness	4.499618	1.315172	0.528419	-0.537894	-1.135805
Kurtosis	26.52936	5.336459	2.863021	2.999654	3.267343
Jarque-Bera	1586.542	30.94436	2.839175	2.893300	13.07920
Probability	0.000000	0.000000	0.241814	0.235357	0.001445
Sum	104.0008	19.39936	58.48924	25.24396	462.6348
Observations	60	60	60	60	60

Source: SPSS Result (2026)

The result shows that on average, the ratio of the debt-to-equity ratio was 1.73 while that of Internal Growth Rate is 0.323. One of the listed companies had a return on asset that is as much as 1.979 while its least was 0.41. The result of the descriptive statistics shows that on average, the six listed

companies maintained an average shareholders' equity ratio of 0.420 while its maximum was 0.652 and a particular listed company had a minimum of 0.069. The Jarque-Bera probability shows that the distribution for Internal Growth Rate (IGR), Debt to Equity Ratio (DER) and Logarithm of Total Asset (LTA) for six listed companies are not normally distributed as their probabilities are all less than 5% while that of Shareholders Equity Ratio (SER) and Returns on Asset (ROA) are normally distributed as their probabilities are greater than 5%.

4.1.2 Correlation Test

This section examines the degree of relationship amongst variables. The correlation test was conducted for the variables under consideration, this is to ensure that there is no perfect positive or negative relationship existing among variables employed, this is to prevent multicollinearity that can be associated with a regression result.

Table 4.2: Correlation Test

	DER	IGR	ROA	SER	LTA
DER	1.00	-0.40	-0.02	-0.75	0.12
IGR		1.00	0.01	0.55	-0.48
ROA			1.00	0.12	0.03
SER				1.00	-0.25
LTA					1.00

Source: SPSS Result (2026)

From Table 4.2, it can be seen that there is no perfect positive or negative correlation associated with the regression result as the highest degree of relationship associated among variables is -0.75, this is between debt-to-equity ratio and shareholder equity ratio.

4.1.3 Hausman Test

The Hausman test is designed to detect violation of the random effects modeling assumption that the explanatory variables are orthogonal to the unit effects. If there is no correlation between the independent variable(s) and the unit effects, then estimates of β in the fixed effects model should be similar to estimates of β in the random effects model. The Hausman test statistic H is a measure of the difference between the two estimates. Under the null hypothesis of orthogonally, H is distributed chi-square with degrees of freedom equal to the number of regressors in the model. A finding that $p < 0.05$ is taken as evidence that, at conventional levels of significance, the two models are different enough to reject the null hypothesis, and hence to reject the random effects model in favor of the fixed effects model. If the Hausman test does not indicate a significant difference ($p > 0.05$), however, it does not necessarily follow that the random effects estimator is "safely" free from bias, and therefore to be preferred over the fixed effects estimator. In most applications, the true correlation between the covariates and unit effects is not exactly zero. Thus, if the Hausman test fails to reject the null hypothesis, it is most likely not because the true correlation is zero and, hence, that the random effects estimator is unbiased. Rather, it is that the test does not have sufficient statistical power to reliably detect departures from the null.

Table 4.3 Hausman test result

Test Summary	Chi-Sq. Statistic	Chi-Sq.	d.f.	Prob.
Cross-section random	0.083270		4	0.9992

Source: SPSS Result (2026)

From the above result, the chi-square probability is 0.9992 which is greater than 5%. This means that we fail to reject the null hypothesis and conclude that the random effect estimation is good and the fixed effect is not, hence we reject the fixed effects model in favour of the random effects model.

4.1.4 Panel Unit Root Test

The study deploys Newey-West automatic bandwidth selection, Levin, Lin & Chu t^* and Im, Pesaran and Shin W-stat test to examine the stationarity of the panel series and test the null hypothesis of unit root. It is expected that the series do not contain unit root in order to find relationship among the variables in the long run. The test is carried out at level, and first difference using Automatic lag length selection based on asymptotic Chi-square distribution. The variables of returns on asset (ROA), internal growth rate (IGR), debt to equity ratio (DER), shareholders equity ratio (SER) and logarithm of total asset (TLA) for six listed companies which include Nigerian Breweries, Cadbury Nigeria Plc, Nestle Nigeria Plc, Dangote Cement Plc, Dangote Sugar Refinery Plc and Flour Mill of Nigeria Plc were tested. The levels of statistics of the tests are reported in Table 4.4.

Table 4.4: Panel Unit Root Result Test at level

Variable	At Level				At First Difference				Desn
	Levin, Lin & Chu t^* stat.	Prob.	Im, Peseran & Shin W-stat	Prob.	Levin, Lin & Chu t^* stat.	Prob.	Im, Peseran & Shin W-stat	Prob.	
ROA	-2.861	0.002	-2.067	0.019	-	-	-	-	I(0)
DER	2.787	0.997	1.267	0.898	-3.458	0.000	-23.42	0.000	I(1)
IGR	-4.074	0.000	-1.168	0.122	-1.824	0.034	-1.659	0.049	I(1)
SER	0.253	0.600	0.267	0.605	-2.203	0.014	-11.090	0.000	I(1)
LTA	-29.768	0.000	-9.718	0.000	-	-	-	-	I(0)

Source: Annual Financial Statement of Selected Companies for the Respective Years

From the Table 4, the Levin, Lin & Chu t^* and Im, Pesaran and Shin W-stat reported returns on asset (ROA) and total assets to be stationary at first difference while DER, IGR and SER are stationary at level and this implies that the variables are stable (stationary) in the short run.

4.1.5 Kao Residual Panel Co-Integration Test

In this sub-section, Kao Residual co-integration test is carried out to test the long run co-movement among the economic variables. Before any useful conclusion could be made regarding relationships between the series. It is of importance that co-integration first exists.

Table 4.5: Co-integration Result

Series: ROA IGR DER SER TLA		
Null Hypothesis: No cointegration		
Trend assumption: No deterministic trend		
	t-Statistic	Prob.
ADF	-2.576	0.0050
Residual variance	0.0465	
HAC variance	0.0450	

Source: SPSS Result (2026)

From Table 4.5, the result shows that at 5% critical value, co-integrating vector exist among the economic fundamentals. By this finding we cannot accept the null hypothesis of no co-integration among the panel series. Hence, the variables are inter-related with each other in the long run that is, they could move together on the long run growth path, and their existing relationships are not spurious.

4.1.6 Test of Hypotheses

Table 4.6: Random Effect Panel Data Regression

Dependent Variable: Returns on Asset (ROA)

Periods included: 6

Cross-sections included: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGR	0.089859	0.020403	4.404172	0.0000
DER	0.023676	0.005961	3.971930	0.0001
SER	1.040624	0.448274	2.321400	0.0240
LTA	0.058747	0.041892	1.402342	0.0064
C	0.072039	0.499518	0.144217	0.8859

Effects Specification

	S.D.	Rho
Cross-section random	0.700983	0.9214
Idiosyncratic random	0.204762	0.0786

Weighted Statistics

R-squared	0.819460	Mean dependent var	0.089665
Adjusted R-squared	0.755420	S.D. dependent var	0.203043
S.E. of regression	0.197336	Sum squared resid	2.141785
F-statistic	9.865411	Durbin-Watson stat	2.097348
Prob(F-statistic)	0.009590		

Source: SPSS Result (2026)

Test of Hypothesis One

H₀: Internal financing has no effect on financial performance of listed firms in Nigeria

H₁: Internal financing has an effect on financial performance of listed firms in Nigeria

Decision Rule: Reject the null hypothesis (H₀) at 5% level of significance if the probability of the coefficient of the internal growth rate (IGR) in Table 4.6 is statistically significant at 5%, otherwise, we fail to reject the null hypothesis.

Conclusion: The hypothesis is rejected because the probability value of the coefficient of the Internal Growth Rate (IGR) in Table 4.6 is less than 5% making the coefficient statistically significant and thus, we reject the null hypothesis and conclude that Internal financing has an effect on financial performance of listed firms in Nigeria. It should be also noted that coefficient of internal growth rate (IGR) has a positive and statistically significant impact on the returns on asset.

Test of Hypothesis Two

H₀: Debt financing has no effect on financial performance of listed firms in Nigeria

H₁: Debt financing has an effect on financial performance of listed firms in Nigeria

Decision Rule: Reject the null hypothesis (H_0) at 5% level of significance if the probability of the coefficient of debt-to-equity ratio (DER) in Table 4.6 is statistically significant at 5%, otherwise, we fail to reject the null hypothesis.

Conclusion: We reject the null hypothesis and accept the alternative because the probability value of the coefficient of debt-to-equity ratio (DER) in table 4.6 is less than 5% making the coefficient statistically significant and thus, we reject the null hypothesis and accept the alternative and conclude that debt financing has an effect on financial performance of listed firms in Nigeria. It should be also noted that debt-to-equity ratio (DER) has a positive and statistically significant impact on the returns on asset.

Test of Hypothesis Three

H₀: Equity financing has no effect on financial performance of listed firms in Nigeria

H₁: Equity financing has a significant effect on financial performance of listed firms in Nigeria

Decision Rule: Reject the null hypothesis (H_0) at 5% level of significance if the probability of the coefficient of Shareholders Equity Ratio (SER) in Table 4.6 is statistically significant at 5%, otherwise, we fail to reject the null hypothesis.

Conclusion: The hypothesis is rejected because the probability value of the coefficient of shareholders' equity ratio (SER) in table 4.6 is less than 5% making the coefficient statistically significant and thus, we reject the null hypothesis and conclude that Equity financing has a significant effect on financial performance of listed firms in Nigeria. It should be also noted that shareholders equity ratio (SER) has positive and statistically significant impact on the returns on assets.

Test of Hypothesis Four

H₀: Firm's size has no effect on financial performance of quoted manufacturing firms in Nigeria.

H₁: Firm's size has a significant effect on financial performance of quoted manufacturing firms in Nigeria.

Decision Rule: Reject the null hypothesis (H_0) at 5% level of significance if the probability of the coefficient of logarithm of total asset (LTA) in Table 4.6 is statistically significant at 5%, otherwise, we fail to reject the null hypothesis.

Conclusion: The hypothesis is rejected because the probability value of the coefficient of logarithm of total asset (LTA) in Table 4.6 is less than 5% making the coefficient statistically significant and thus, we reject the null hypothesis and conclude that logarithm of total asset (LTA) has a significant effect on financial performance of quoted manufacturing firms in Nigeria. It should be also noted that logarithm of total asset (LTA) has positive and statistically significant impact on the returns on assets.

4.2 Discussion of Findings

The empirical findings of this study examine the effect of capital structure on the financial performance of six quoted manufacturing firms in Nigeria over the period 2016 to 2025. The descriptive statistics reveal that the sampled firms maintained a mean Debt to Equity Ratio of 1.733, indicating moderate to high reliance on external borrowing, a mean Internal Growth Rate of 0.323 reflecting moderate self-financing capacity, and a mean Shareholders' Equity Ratio of 0.421 indicating that approximately 42 percent of total assets were financed through owners' equity. The mean Return on Assets of 0.975 reflects considerable variability in asset utilization efficiency across the sampled firms. The correlation analysis confirmed the absence of perfect multicollinearity, while the Kao Residual Cointegration Test established a stable long-run equilibrium relationship among the variables with an Augmented Dickey-Fuller statistic of -2.576 and a probability value of 0.005, confirming that observed relationships are genuine and non-spurious. The Hausman test probability of 0.999 confirmed the appropriateness of the random effects estimator, and the overall model recorded an F-statistic of 9.865 with a probability of 0.010 and an R-squared of 0.819, indicating that approximately 81.9 percent of the variation in Return on Assets is jointly explained by the independent variables.

The Internal Growth Rate recorded a positive coefficient of 0.090 with a probability value of 0.000, leading to the rejection of the first null hypothesis and confirming that internal financing exerts a positive and significant effect on financial performance. This implies that firms with stronger internal financing capacity achieve superior profitability by reducing dependence on costly external capital, consistent with the Pecking Order Theory and corroborating the findings of Ozkan and Ozkan (2023) and Adewale and Rasheed (2024), who established that robust internal cash generation significantly enhances profitability in structurally constrained financing environments.

The Debt to Equity Ratio yielded a positive coefficient of 0.024 with a probability value of 0.000, resulting in the rejection of the second null hypothesis and confirming that debt financing positively and significantly affects financial performance. This suggests that within the observed leverage range, sampled firms successfully harness the tax shield benefits of debt to enhance profitability without incurring disproportionate financial distress costs, consistent with Abor (2022) and Zeitun and Saleh (2023), who similarly reported positive leverage-performance relationships among manufacturing firms in emerging economies operating within moderate debt ranges.

The Shareholders' Equity Ratio produced a positive coefficient of 1.041 with a probability value of 0.024, leading to the rejection of the third null hypothesis and confirming that equity financing exerts a positive and significant effect on financial performance. The notably large coefficient indicates that a stronger equity base exerts a more pronounced influence on profitability than either internal financing or debt financing, suggesting that equity capital provides the financial stability and investment flexibility necessary to sustain superior returns. This finding is consistent with Salawu and Agboola (2022) and Matemilola et al. (2023), who reported that higher equity ratios are associated with greater financial stability and sustained profitability.

The Logarithm of Total Assets recorded a positive coefficient of 0.059 with a probability value of 0.006, resulting in the rejection of the fourth null hypothesis and confirming that firm size positively and significantly influences financial performance. This confirms that larger manufacturing firms leverage scale economies, superior market access, and reduced information asymmetry to generate higher profitability, consistent with Frank and Goyal (2023) and Innocent et al. (2023), who reported significant positive size-performance relationships across comparable emerging market contexts.

Overall, all four null hypotheses are rejected, confirming that internal financing, debt financing, equity financing, and firm size each exert positive and statistically significant effects on the financial performance of quoted manufacturing firms in Nigeria, consistent with the a priori expectations and the theoretical predictions of the Pecking Order Theory of Myers and Majluf (1984).

5 Summary, Conclusion and Recommendations

5.1 Summary

This study examined the effect of capital structure on the financial performance of quoted manufacturing firms in Nigeria over the period 2016 to 2025, motivated by the persistent inconsistency in empirical findings and the continued financing challenges confronting manufacturing enterprises in Nigeria's volatile and structurally constrained economic environment. Anchored on the Pecking Order Theory of Myers and Majluf (1984), the study employed a quantitative longitudinal research design and analyzed secondary data sourced from the audited annual financial statements of six listed manufacturing firms using random effects panel data regression. Four capital structure variables, namely internal financing proxied by the Internal Growth Rate, debt financing proxied by the Debt to Equity Ratio, equity financing proxied by the Shareholders' Equity Ratio, and firm size proxied by the Logarithm of Total Assets, were examined in relation to financial performance measured by Return on Assets. The empirical findings collectively established that all four capital structure variables exert positive and statistically significant effects on the financial performance of the sampled firms, leading to the rejection of all four null hypotheses.

5.2 Conclusion

From the findings, it was concluded that internal financing was found to enhance profitability by reducing dependence on costly and sensitive external capital. This is consistent with the Pecking Order Theory's prediction that retained earnings represent the most value enhancing financing source available to the firm. Debt financing, within the moderate leverage range observed among the sampled firms, positively influenced financial performance through tax shield benefits and earnings amplification effects, suggesting that the sampled firms successfully managed their leverage positions without incurring disproportionate financial distress costs. Equity financing demonstrated the strongest positive influence on financial performance among the four variables, confirming that a robust equity base provides Nigerian manufacturing firms with the financial stability, shock absorption capacity, and investment flexibility necessary to sustain superior profitability over time. Firm size equally exerted a significant positive effect on financial performance, affirming that larger manufacturing firms leverage scale economies, stronger market access, and reduced information asymmetry to generate consistently higher returns than their smaller counterparts.

The overall model explained approximately 81.9 percent of the variation in Return on Assets, reflecting strong collective explanatory power and confirming the joint relevance of capital structure decisions in determining the financial performance of quoted manufacturing firms in Nigeria. The findings therefore contribute meaningful and contextually grounded empirical evidence to the capital structure literature, particularly in the Nigerian manufacturing context where financing constraints and macroeconomic volatility make sound financing decisions a critical determinant of firm survival and performance sustainability.

5.3 Recommendations

Based on the empirical findings and conclusions of this study, the following recommendations are offered to corporate managers, investors, policymakers, and other relevant stakeholders:

Corporate managers of quoted manufacturing firms in Nigeria should prioritize the cultivation and preservation of strong internal financing capacity by adopting disciplined earnings retention policies that maximize the accumulation of retained earnings available for reinvestment. Given the positive and significant effect of internal financing on financial performance established in this study, management should resist excessive dividend distributions during periods of strategic investment need and instead direct internally generated funds toward value-creating capital expenditures, operational improvements, and growth initiatives that strengthen long-term profitability and reduce dependence on costly external capital markets.

With respect to debt financing, corporate managers should adopt a strategically calibrated approach to leverage management that harnesses the tax shield and earnings amplification benefits of debt while maintaining leverage ratios within ranges that do not expose the firm to unacceptable financial distress risks. Given the positive relationship between moderate debt financing and financial performance established in this study, firms should actively monitor their debt service coverage ratios and ensure that borrowing decisions are guided by a clear assessment of the firm's capacity to generate operating cash flows sufficient to service debt obligations without constraining investment flexibility or undermining operational resilience.

Regarding equity financing, corporate managers and boards of directors should recognize the critical importance of maintaining a strong and adequately capitalized equity base as a foundation for sustained financial performance. The notably large positive effect of the Shareholders' Equity Ratio on Return on Assets established in this study suggests that strengthening equity capital through retained earnings accumulation, judicious rights issues, and prudent dividend policies represents one of the most effective strategies available to Nigerian manufacturing firms for enhancing long-term profitability and financial stability. Firms with currently weak equity positions should explore strategic options for equity recapitalization as a means of reducing financial risk and improving performance outcomes.

On the role of firm size, management should pursue deliberate and strategically sound growth strategies that expand the firm's asset base, market reach, and operational scale over time, as the positive relationship between firm size and financial performance confirmed in this study demonstrates that larger organizational scale translates directly into superior profitability through economies of scale, enhanced market power, and reduced information asymmetry with capital providers. Merger and acquisition strategies, organic expansion programs, and strategic asset investments that grow the firm's total asset base should be evaluated and pursued where they are consistent with long-term value creation objectives.

From a policy perspective, the Nigerian government and relevant regulatory authorities, including the Securities and Exchange Commission and the Central Bank of Nigeria, should intensify efforts to deepen and develop domestic capital markets in order to reduce the structural financing constraints that compel Nigerian manufacturing firms to rely excessively on short-term and costly debt financing. Specific policy interventions should include the reduction of bank lending rates through monetary policy adjustments, the development of a robust long-term bond market accessible to manufacturing firms, the strengthening of investor protection frameworks to encourage greater equity market participation, and the provision of targeted fiscal incentives such as interest deductibility enhancements and investment tax credits that support the financing of productive manufacturing activities. These measures would collectively reduce the cost and expand the availability of financing

options for Nigerian manufacturing firms, enabling more optimal capital structure decisions and supporting stronger and more sustainable financial performance outcomes across the sector.

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