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CAPITAL STRUCTURE ANALYSIS AND PERFORMANCE OF LISTED MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT
This research examined capital structure analysis and performance of Nigerian firms. Four (4) manufacturing firms in Nigeria were selected using judgmental sampling procedure over a twenty- five (25) year period (2000-2024) with the aim of providing a critical analysis and the need for proper appraisal of funding/financing sources so as to enhance the wealth of the organizational constituencies. In achieving the above objective, multiple regression was employed as a test statistic to find out/analyze the effect and relationship of key variables such as long-term debt to equity (LTD/E), short-term debt to equity (STD/E) and two (2) control variables - size(S) and asset growth (AG) on Return on Equity(ROE) and Return on Asset (ROA). Secondary data were obtained from four (4) manufacturing firms namely Nestle Nigeria Plc, Vita Foam Plc, 7UP bottling company, and First Aluminum Plc. Results from the research showed a positive relationship between return on equity (ROE) and short-term debt to equity ratio (STD/E) while adverse relationships were observed between long-term debt to equity ratio (LTD/E) and ROE, LTD/E and ROA and STD/E and ROA all taken individually. On a joint basis, the results confirmed that there is a positive and significant relationship between the components of capital structure and ROE and ROA respectively. The F-statistics (Model 1: Fcal. = 24.427 and Model 2: Fcal. = 70.811), as well as T-statistics (Model 1: Tcal.= -0.783 for LTD/E and Tcal.= 2.931 for STD/E; Model 2: Tcal.= -1.130 for LTD/E and Tcal.= 2.857 for STD/E) indicate the significance levels of the independent variables in explaining firm performance. The model's explanatory power, as measured by the Adjusted R-Square (77.2% for Model 1 and 83.0% for Model 2), confirms the reliability of the findings. In conclusion, while capital structure decisions are critical to firm performance, their effects are not uniform across all components or firms. Based on the empirical findings, the following recommendations are proposed: Nigerian manufacturing firms are advised to strategically prioritize short-term debt in their financing mix; Firms should undertake rigorous cost-benefit analysis before assuming long-term liabilities, ensuring that such debt aligns with the firm's investment horizon and revenue-generating potential; Firms are also encouraged to adopt a holistic financial management approach that includes other determinants of performance, such as internal control systems, workforce quality, operating environment, and strategic governance; Firms must ensure that all funds - whether internally generated or externally sourced - are allocated prudently.

Key words: *Capital structure, Performance, Debt-to-Equity Ratio, Return on Equity, Return on Asset, Manufacturing firms.*

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INTRODUCTION

Capital structure and firm performance remain pivotal concerns for both scholars and financial practitioners. Strategic capital structure decisions can significantly influence a firm's cost of financing and its overall financial performance. An optimal capital structure—defined as the right mix of debt, equity, and hybrid instruments—enables firms to minimize their cost of capital and maximize value (Sharon & Mohammed, 2024). This financing mix is critical not only for operational efficiency but also for long-term growth and competitiveness, particularly in capital- intensive sectors such as manufacturing. In the context of manufacturing firms, capital structure decisions transcend routine financial management; they represent strategic imperatives that affect innovation capacity, market expansion, operational resilience, and the ability to navigate economic volatility (Sebil, 2024). The foundational work of Modigliani and Miller (1958) on the "Capital Structure Irrelevance Theory" marked a turning point in the capital structure discourse. Their assertion—that a firm's value is independent of its financing mix in a perfect market—has been subsequently nuanced by researchers who incorporate real-world frictions such as taxation, bankruptcy costs, and information asymmetry.

In response to these complexities, capital structure has attracted growing attention in both academic and professional finance domains. Scholars such as Anyanwu, Ajukwara, and Anyanwu (2013) highlight the strategic importance of financing decisions, which affect both short- and long-term financial outcomes. Empirical evidence underscores the direct link between capital structure choices and firm performance, particularly through their impact on market valuation and operational efficiency. In Nigeria, suboptimal capital structures have been identified as a key constraint to firm growth and sustainability (Sunday & John, 2024). The modern theory of capital structure has evolved to incorporate tax advantages of debt, following Modigliani and Miller's revision in 1963. Under a tax regime that permits interest deductibility, debt financing becomes appealing as it reduces the overall Weighted Average Cost of Capital (WACC). However, excessive reliance on debt elevates financial risk, potentially offsetting the tax benefits. Identifying the equilibrium point—where the marginal benefit of debt equals its marginal cost—is crucial for determining a firm's optimal capital structure. The determination of capital structure is further complicated by firm-specific characteristics. As Agbor (2008) noted, factors such as firm size, age, asset structure, profitability, risk exposure, taxation, and ownership configuration significantly influence capital structure decisions. Supporting this view, Patrick (2009) emphasized that financing decisions directly affect a firm's WACC—an essential metric in valuation and investment

planning. Since the value of a firm is the present value of its future cash flows discounted by the appropriate cost of capital, minimizing the WACC becomes a central objective in maximizing shareholder wealth.

Financial managers in Nigeria face four core responsibilities: capital budgeting, capital structure planning, working capital management, and dividend policy formulation. Among these, capital structure decisions are particularly complex, requiring a careful evaluation of internal and external factors. Despite the vast body of literature from developed economies, empirical studies exploring the capital structure-performance nexus in developing countries like Nigeria remain limited. Firms seeking new capital often face the dilemma of choosing between debt and equity financing. Given the strategic importance of profitability as a proxy for firm performance, it is essential to understand the extent to which different financing choices impact firm outcomes. This gap in the literature is particularly pronounced in the Nigerian context, where few studies have systematically analyzed the determinants of capital structure and their influence on performance in the manufacturing sector. This study, therefore, seeks to examine the relationship between capital structure and firm performance,

Objectives

This study broadly aimed at analyzing the relationship between capital structure and the performance of manufacturing-sector firms quoted on the Nigerian Exchange Group. To achieve the aim, the following specific objectives were identified.

1. to determine if a significant relationship exists between Debt/Equity ratio (short and long term debt to equity), Size, Asset Growth and firm performance measured by return on owners' investment in the business (Return on equity-ROE) in the manufacturing firms in Nigeria.
2. to ascertain the relationship between Debt/Equity ratio (short and long term debt to equity), Size, Asset Growth and firm performance measured by efficiency of asset utilization by management (Return on asset-ROA) in the manufacturing firms in Nigeria.
3. to find out the relative contribution of each of the component of capital structure to the returns to owners of the firm as measured by return on equity (ROE) in the manufacturing firms in Nigeria.
4. to determine the relative contribution of each of the component of capital structure in the efficient utilization of assets by the management as measured by return on asset (ROA) in the manufacturing firms in Nigeria.

LITERATURE REVIEW

Concept of Capital Structure

Maximizing shareholder value remains a key objective of financial management. As noted by Erhard and Brigham (2003), a firm's value depends on the present value of its expected future cash flows, discounted at the Weighted Average Cost of Capital (WACC). Since WACC directly influences firm value (Johannes & Dhanraji, 2007), identifying the optimal capital structure—an ideal debt-equity mix that minimizes WACC and maximizes shareholder wealth—is crucial. Capital structure refers to the proportion of debt and equity used to finance a firm. Equity financing includes issuing shares or reinvesting profits, while debt financing involves loans and debentures. Scholars like Iwere and Akinyele (2010) and Pandey (2000) describe it as the method or balance through which firms secure funding. Miller and Modigliani's (M&M) seminal theory argues that under perfect market conditions—no taxes, transaction or bankruptcy costs, and full information—capital structure does not affect firm value. However, in real-world settings, these conditions rarely hold, making capital structure decisions impactful. For example, higher debt raises financial risk and the cost of equity. According to Myers (1984), reliance on debt may discourage investment in profitable projects, leading to underinvestment.

Empirical studies support these concerns. Barclays and Smith (1995) and Ozkan (2002) show that excessive leverage can harm performance, influenced by the maturity of debt. Stulz (1995) adds that while debt can discipline management, it may also intensify underinvestment, especially in mature firms with limited growth. Though leverage can lower taxes and boost return on equity (ROE), it must be balanced against financial risk. Thus, the trade-off between debt benefits and costs underscores the need for an optimal capital structure that minimizes WACC and maximizes firm value. Yet, no universal formula exists, as optimal structures depend on firm-specific and market factors, such as size, age, growth opportunities, and risk. These factors shape leverage decisions and highlight capital structure's crucial role in firm performance—especially for listed manufacturing firms in emerging markets like Nigeria.

Debt-equity Ratio and Firm Performance

The debt-equity ratio is a financial metric that indicates the degree to which a firm is financing its operations through debt versus wholly-owned funds. A high debt-equity ratio implies greater reliance on borrowed funds, while a low ratio suggests that a firm is using more of its own capital. According to Modigliani and Miller's (1958) capital structure irrelevance theory,

under perfect market conditions, the value of a firm is unaffected by its capital structure. However, in real-world scenarios, market imperfections like taxes, bankruptcy costs, and agency costs influence the impact of debt-equity ratio on firm performance. Several empirical studies have investigated the relationship between debt-equity ratio and firm performance among Nigerian manufacturing firms. The results have been mixed, reflecting the complex dynamics of Nigeria's business environment. For instance, Salawu and Agboola (2008) found a negative relationship between high leverage and performance in Nigerian companies, suggesting that excessive debt could lead to financial distress and reduced profitability. This finding aligns with the pecking order theory, which posits that firms prefer internal financing over debt due to the cost and risk associated with external funding.

In contrast, Akintoye (2008) reported a positive relationship between moderate levels of debt and firm performance, indicating that some level of debt can enhance firm value through tax shields and by disciplining management to use resources more efficiently. Additionally, Uwalomwa, Uwuigbe, and Oyefusi (2015) examined the capital structure of listed manufacturing firms in Nigeria and concluded that while long-term debt had a statistically insignificant effect on return on assets (ROA), equity financing had a more consistent positive effect on performance. This suggests that Nigerian manufacturing firms may not be optimally utilizing debt to improve performance. The manufacturing sector in Nigeria is often constrained by limited access to long-term finance, high interest rates, and macroeconomic volatility, which affect the optimal capital structure. In such a context, an overreliance on debt can be detrimental due to high debt servicing costs and increased bankruptcy risk. Therefore, a balanced debt-equity ratio is essential to ensure sustainable growth and enhanced performance. Furthermore, firm-specific factors such as size, asset tangibility, and growth opportunities also mediate the relationship between debt-equity ratio and performance. Larger firms with more tangible assets may be better positioned to take on debt compared to smaller firms with limited collateral.

The following null hypotheses have been formulated:

H_{01}: *Debt to equity ratio (short and long term debt to equity) have no significant relationship with the performance (Return on Equity-ROE) of Nigerian manufacturing firms.*

H_{02}: *Debt to equity ratio (short and long term debt to equity) have no significant relationship with the performance (Return on Assets-ROA) of Nigerian manufacturing firms.*

H_{03}: *Capital structure components do not contribute significantly to return on equity (ROE) in manufacturing firms in Nigeria.*

H_{04}: *Capital structure components do not contribute significantly to Return on Asset (ROA) in manufacturing firms in Nigeria.*

Theoretical Review

This study is anchored on the Pecking Order Theory. The Pecking Order Theory (POT), developed by Myers and Majluf (1984), provides a foundational perspective on how firms prioritize their sources of financing. The theory posits that firms follow a hierarchical order when making financing decisions: they prefer internal financing (retained earnings) first, then debt, and resort to issuing new equity only as a last resort. This hierarchy is largely driven by information asymmetry between managers and investors, which causes external financing—particularly equity—to be costlier due to the perceived risk of adverse selection. In the context of listed manufacturing firms in Nigeria, the Pecking Order Theory offers important insights into how such firms structure their capital in response to internal resource availability and external market conditions. Nigerian manufacturing firms, like their global counterparts, may exhibit a preference for internal financing due to limited access to efficient capital markets and high costs associated with debt and equity issuance (Abor, 2005; Salawu & Agboola, 2008). Given the economic volatility and underdeveloped financial systems prevalent in emerging economies, internal funds are often seen as more reliable and less costly.

Empirical studies in Nigeria have shown a mixed application of the pecking order behavior. For instance, Salawu and Agboola (2008) found that Nigerian firms prefer internal financing but resort to debt when internal funds are insufficient, supporting the POT. However, in periods of financial constraint or macroeconomic instability, even debt financing becomes expensive, prompting firms to alter their financing priorities (Ndugbu & Okere, 2015). Moreover, the reliance on internal financing can influence firm performance, especially in capital- intensive sectors like manufacturing. The inability to secure adequate external funds might hinder growth opportunities, thereby affecting profitability and long-term performance. This relationship highlights the importance of understanding how financing preferences impact firm outcomes in the Nigerian manufacturing sector. In essence, the Pecking Order Theory provides a valuable framework for analyzing capital structure decisions in Nigerian manufacturing firms. It emphasizes the role of internal resources and the cost implications of external financing, especially in environments marked by financial market inefficiencies.

Empirical Review

Many authors have successively proved that a relationship between capital structure and firm performance exists. After more than fifty years of studies, economists have not reached an agreement on how and to which extent the capital structure of firms impact on their values, performance, and governance. However, the studies and empirical findings of the last decades have at least demonstrated that capital structure has more importance than in simplistic Modigliani and Miller model. Hence, the study will seek to highlight some of the empirical studies on the relationship between capital structure and firm performance grouped based on their findings.

Peace and Onyenania (2025) explored the relationship between capital structure and financial performance, focusing on the metrics of gross profit margin (GPM), return on capital employed (ROCE), return on assets (ROA), and return on equity (ROE) in the context of business firms and banks in Nigeria. Drawing on secondary data from ten selected Nigerian firms over five years, the study uses quantitative methods, specifically regression analysis, to investigate the influence of capital structure on financial performance. The findings suggest that capital structure, particularly the debt-equity ratio (DER), has a significant yet complex effect on key performance indicators such as ROA and ROCE. The study also highlights that while capital structure directly impacts the gross and net profits of firms, the relationship between capital structure and operating profit is less definitive due to the influence of external factors such as market forces and economic conditions. Key findings indicate a weak positive correlation between capital structure and gross profit ($R^2 = 0.147$), and a similarly low correlation between capital structure and net profit ($R^2 = 0.108$), suggesting that changes in capital structure explain a small proportion of variations in financial performance.

Omole and Adewumi (2024) investigated the complex dynamics among capital structure, board characteristics, and financial performance in listed non-financial companies in Nigeria. Utilizing purposive sampling, the study focuses on 67 companies, primarily non-financial, renowned for consistently providing accessible data. Annual reports from 2012 to 2022 serve as the data source, covering metrics related to capital structure (Debt to Assets Ratio and Leverage Ratio), board characteristics (CEO Duality, Board Size, and Board Gender Diversity), and financial performance (Return on Assets, Dividend per Share, and Earnings per Share). Employing panel data econometrics techniques, including fixed and random effects pooled regression models, the study analyzes these relationships. The findings reveal

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a statistically insignificant negative impact of capital structure on financial performance, indicated by Debt to Assets Ratio and Leverage. CEO duality shows a negative effect on Earnings per Share without statistical significance. In contrast, Board Size and Board Gender Diversity significantly positively influence Earnings per Share, underscoring their importance in enhancing firm performance.

Onunaka, Okezie, and Godspower (2024) examined moderating effect of audit committee independence on the relationship between capital structure and financial performance of listed deposit money banks in Nigeria. The study employed ex-post facto research design and extracted secondary data from annual reports of five (5) selected listed deposit money banks in Nigeria from the Nigerian Exchange Group Floor listing for the period 2013 to 2022. Data were analyzed using the Multiple Regression Analysis. The results of the finding revealed that Capital Structure has a significant effect on Return on Assets of listed Deposit Money Banks in Nigeria. Also, the result of the moderation revealed that after introducing the moderating variable (audit committee independence) on the relationship between capital structure and financial performance, Audit committee independence has a significant moderating effect on the relationship between capital structure (Debt to Equity and Long term debt) and Return on Assets of listed deposit money banks in Nigeria. Therefore, the study recommends that in order to improve performance, corporate managers are advised to reduce financial leverage.

Sebil (2024) investigates the relationship between capital structure and the performance of 10 selected consumer goods in Nigeria. The research utilizes a quantitative design and data was sourced from annual reports of the firms with complete financial records. The correlation analysis indicates a negative relationship between all independent variables total debt (TD), age(AGE), debt to equity ratio (DE), and long-term debt to capital employed (LDCE) and return on investment (ROI), while only return on assets (ROA), TD, and DE exhibit significant associations with firm performance. TD and DE negatively impact firm performance, emphasizing the intricate dynamics of capital structure decisions. Multiple regression results reveal a positive but statistically insignificant effect of DE on ROI. Conversely, DE significantly positively influences ROA, underlining the importance of an optimal debt-equity mix for enhanced financial outcomes.

Sharon and Mohammed (2024) investigates the influence of capital structure on the financial performance of consumer goods companies in Nigeria. Utilizing secondary data from the

annual financial reports of 21 sampled companies from 2013 to 2022, obtained from the Nigeria Stock Exchange website, the research employed a census sampling technique and an ex-post facto research design to explore the relationship between independent and dependent variables. Descriptive statistics, correlation, and multiple regression analysis were conducted to test hypotheses. The study reveals a significant association between a firm's capital structure and its financial performance. Specifically, it finds that the total debt to total equity ratio, short-term debt to total assets ratio, and long-term debt to total assets ratio do not significantly impact the financial performance of listed consumer goods firms in Nigeria.

Ozondu and Egbunike (2024) investigated the effect of capital structure on financial performance of listed deposit money banks in Nigeria. The study adopted ex post-facto research design. The data for the study was sourced from the published financial reports of the concerned banks. Pearson correlation and multiple regression analyses were used for data analysis with the help of Stata 13 software. The result showed that there is the existence of a positive and significant effect of debt capital on net profit of listed deposit money banks on the Nigerian Stock Exchange. The study concluded that statistically, there is positive and significant effect of capital structure on financial performance of listed deposit money banks in Nigeria. The study therefore recommended that management of deposit money banks in Nigeria should endeavor to finance their business activities with equity and debts as encouraged by pecking order theory and agency theory. Lastly, the management of deposit money banks in Nigeria should consider industry benchmarks and best practices in capital structure management in order to continue operating productive business activities.

Isiaka (2023) evaluated the impact of capital structure on firm’s value in Nigeria's food and beverages sector. A quantitative research approach was employed concentrating on the association between financial ratios (debt to equity, return on assets, current ratio, asset growth and firm size) and stock prices as a proxy for firm value. Panel data was gathered from financial statements of the 16 publicly quoted food and beverages companies in the Nigeria Stock Exchange from 2017-2021 and the data was analyzed using statistical software. The descriptive statistics showed features of the variables, revealing variation in stock prices, return on assets, current ratio, asset growth, firm size and debt to equity ratio. Regression analysis using the random effects model exhibits the significance of the firm size on stock prices. Also, other variables such as current ratio, return on asset, and debt to equity and asset growth are statistically significant. The study concluded that firm size has a negative and significant impact on stock prices, revealing that larger firms tend to have lower stock prices.

Akintola, Tomori and Audu (2023) explored the effect of capital structure on financial performance of quoted manufacturing firms in Nigeria. The study made use of panel least square multiple regression to analyze the secondary data sourced from financial statements of 14 sampled organizations from 2011-2020. The result of the analyses revealed that there is no statistically significant relationship between total debt to total equity and return on asset of manufacturing firms in Nigeria. The study also showed no long-run relationship between debt to total asset and return on assets. The study therefore suggests that management of manufacturing firms that are active on the stock exchange market should make attempt to increase their long-term debt to total asset in order to boost their business activities and by extension, their financial performance.

Ifeanyi and Ukaegbu (2023) examined the effect of capital structure on financial performance of listed industrial goods manufacturing firms in Nigeria. The secondary data used were sourced from the annual financial reports and accounts of the firms under study from 2013 to 2022. The study adopted ex-post-facto research design. The data were analyzed using descriptive statistics, unit root test, and diagnosis test and panel least square regression analysis with the aid of E-view 12. The study results revealed that there is a significant effect of equity capital, debt capital and retained earnings on the financial performance of manufacturing firms in Nigeria. The study therefore recommended that listed industrial goods manufacturing firms in Nigeria should make use of more debt capital because it increases their financial performance in terms of earnings per share and also the shareholders' wealth would be increased.

Nwafor, Yusuf, and Shuaibu (2022) investigated the impact of capital structure on the profitability of listed pharmaceutical companies in Nigeria. Using an ex-post facto research design, the study analyzed secondary data from the annual financial reports of four listed pharmaceutical companies. The analysis employed descriptive statistics, correlation analysis, and pooled ordinary least square regression. The results indicated a negative relationship between the total debt ratio (TDR) and profitability, while the debt-equity ratio (DER) showed a positive relationship with profitability. Based on these findings, the study recommended that pharmaceutical companies in Nigeria reduce their debt levels, as excessive debt harms profitability, and instead rely more on internal financing, which is both cheaper and more reliable.

Idolor and Omehe (2022) explored the effect of capital structure on the financial performance of listed deposit money banks in Nigeria. This study used a cross-sectional time series of secondary data from the audited financial statements of ten banks listed on the Nigerian Stock Exchange, covering the period from 2015 to 2021. Descriptive statistics, Pearson correlation, and multiple linear regression were employed in the analysis. The correlation results revealed a negative relationship between capital structure and the financial performance (Return on Assets and Return on Equity) of these banks. Panel regression results showed that debt to equity negatively affected both return on assets (ROA) and return on equity (ROE), while asset tangibility significantly impacted ROA but had no significant effect on ROE. The study concluded that capital structure negatively affects the financial performance of deposit money banks in Nigeria and recommended that an optimal capital mix be adopted to maximize shareholder returns and enhance firm value.

Numerous studies have explored the link between capital structure and firm performance, particularly in developed economies. Modigliani and Miller (1958) argue that, in perfect markets, capital structure is irrelevant to firm performance. In contrast, later research by Myers (2001) and Fama and French (2002) highlights the role of market imperfections—such as taxes, bankruptcy costs, and agency conflicts—in shaping this relationship. More recent work, like DeAngelo and Stulz (2015), revisits these classical theories in modern contexts. However, such studies largely focus on developed markets and may not be directly applicable to developing economies like Nigeria, where financial systems are less mature.

In Nigeria, limited access to long-term financing and underdeveloped capital markets influence firms' capital structure decisions. Ojo (2019), for instance, finds that Nigerian manufacturing firms depend heavily on short-term debt due to the high cost and scarcity of long-term capital. Yet, the impact of these financing choices on firm performance remains insufficiently studied.

The manufacturing sector is vital to Nigeria's economy, contributing significantly to GDP, employment, and exports. However, research on the capital structure-performance nexus within this sector is limited. Manufacturing firms face specific challenges—such as capital intensity, exchange rate volatility, and inflation—that likely influence their financing strategies and performance outcomes.

Some studies, such as Fakiyesi and Akinlo (2012), address capital structure within Nigeria's broader economic context but overlook sector-specific dynamics and firm-level heterogeneity. Others, like Akinmoladun and Ojo (2018), focus on industry-level analyses but lack depth in linking capital structure decisions to both financial and operational performance metrics within manufacturing. Additionally, methodological limitations weaken many existing studies. For example, Eze and Okoye (2021) use cross-sectional data, which cannot capture causal dynamics or temporal effects such as regulatory shifts or economic fluctuations. Sampling biases also persist; studies like Alile (2020) rely on narrow firm selections, limiting generalizability. Furthermore, there is a notable gap in recent research that considers the impact of contemporary global challenges—such as supply chain disruptions and inflation—on capital structure decisions in Nigerian manufacturing firms.

MATERIALS AND METHOD

This study adopted ex post facto research design since the study's variables are already in existence (reported in the audited annual reports of the companies under study), hence cannot be manipulated. This study focuses on selected listed manufacturing firms in Nigeria as at 2024 financial year; Judgmental sampling procedure was employed in selecting the study's sample firms. In other words, to guard against data omission and ensure uniformity in presentation, four (4) manufacturing firms with complete data for the period of 2000-2024 (7-UP Bottling Company Plc, Nestle Nigeria Plc, First Aluminum Nigeria Plc, and Vitafoam Nig. Plc) were selected. Multiple regression models have been employed to express the relation between the dependent and independent/explanatory variables. Considering that two (2) dependent variables are employed in measuring the profit performance of the firms under study, the following multiple regression models have been postulated. The independent variables consist of long-term debt, short term debt and control variables which are firm size and asset growth while dependent variables are Return on Equity (ROE) and Return on Asset (ROA).

Multiple regression models have been employed to express the relation between the dependent and independent/explanatory variables. Considering that two (2) dependent variables are employed in measuring the profit performance of the firms under study, the following multiple regression models have been postulated. The independent variables consist of long-term debt, short term debt and control variables which are firm size and asset growth while dependent variables are Return on Equity (ROE) and Return on Asset (ROA). The generic model of the study is as follows;

Model 1: ROE = f(LTDE + TDE + S + AG)……..Eqn 1.

Model 2: ROA = f(LTDE + TDE + S + AG)……. Eqn 2.

The above is however represented in econometric format:

Model 1: $ROE = \beta_0 + \beta_{1L}TDE_{it} + \beta_2 TDE_{it} + S_{it} + AG_{it} + \mu_{it}$ …… Eqn 3.

Model 2: $ROA = \beta_0 + \beta_{1L}TDE_{it} + \beta_2 TDE_{it} + S_{it} + AG_{it} + \mu_{it}$ …….. Eqn 4.

Where:

ROE = Ratio of profit before tax (PBT) to equity ROA = Ratio of profit before tax (PBT) to total assets LTD/E = Ratio of long term debt to equity

TD/E = Ratio of total debt to equity (debt-equity ratio) S = Size

AG = Asset Growth

μ = Error term

i = Cross section dimension

t = Time series dimension

β_0 = Constant

β_1 — β_2 = Parameters estimated

The entire explanatory variables in the model are expected to impact positively on the dependent variables (ROE and ROA). It should be noted that measurement of firm size uses different methods as scholars vary. According to Twite (2003), firm size is calculated as natural log of total book value of assets, so in this study, we used logarithm of book value of total asset to measure firm size (control variable) and percentage change in total asset as asset growth (control variable). Hence, the following a prior expectation exists: $\beta 1 > 0$; $\beta 2 > 0$. The Statistical Package for Social Sciences (SPSS, version 23) was used in analyzing the time-series data extracted for the study. Interestingly, the software is designed to provide statistical results for measurement parameters like correlation coefficient, coefficient of determination (R2), adjusted R square, t-statistics, F-statistics (ANOVA), et cetera.

ANALYSES AND RESULTS DISCUSSION

Table 1: Model Summary: Relationship between Short-term Debt, Long-term Debt, Growth, Size and Return on Equity (ROE)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin- Waston
1	0.924	0.854	0.772	14.879	2.152

a. Predictors :(constant), G, LTDE, STDE, S

b. Dependent Variable: ROE

The result presented in Table 1 shows the relationship between short term debt, long term debt, growth, size and return on equity. The obtained multiple correlation coefficient of 0.924 shows that there is strong positive relationship between long and short debt, growth, size and return on equity. This shows that as the firm long and short term debt, size and growth increase, return on equity increases. The results show that 92.4% of variation in the return on equity can be accounted or explained by long and short debt, growth and size of the firm as shown in the R Square. The standard error of measurement is 14.879.

Table 2: Model Summary: Relationship between Short-term Debt, Long-term Debt, Growth, Size and Return on Assets (ROA)

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate	Durbin- Waston
1	0.973	0.947	0.830	15.128	2.076

a. Predictors: (constant), G, LTDE, STDE, S
b. Dependent Variable: ROA

Analysis of result in Table 2 shows the relationship between short term debt, long term debt, growth, size and return on assets. The obtained multiple correlation coefficient of 0.973 shows that there is strong positive relationship between long and short debt, growth, size and return on assets. This shows that an increase in the firm long and short term debt, size and growth will increase the efficiency of assets utilization measured by return on asset of the company.

The results indicate that 97.3% of variation in the return on assets can be accounted or explained by long and short debt, growth and size of the firm as shown in the R Square. The adjusted R square of value of 0.947 indicates that 94.7% of the variance in returned on assets are explained in the model. The standard error of measurement is 15.128.

Test of Hypotheses

Hypothesis One

H_{01}: Debt to equity ratio (short and long term debt to equity) have no significant relationship with the performance (Return on Equity-ROE) of Nigerian manufacturing firms.

H_{i1}: Debt to equity ratio (short and long term debt to equity) have significant relationship with the performance (Return on Equity-ROE) of Nigerian manufacturing firms.

Table 3: Contribution of each Dependent Variable in Model 1

Model	Unstandardized coefficients		Standardized coefficients		
	B	Std. Error	Beta	T	Sig
(constant)	178.888	82.774		2.193	0.64
LTDE	-0.124	0.160	-0.106	-0.783	0.484
STDE	0.402	0.139	0.621	2.931	0.032
S	-24.819	15.688	-0.383	-1.606	0.151
G	-0.340	0.164	-0.295	-2.094	0.068

a. Dependent Variable: ROE

The analysis of data in Table 3 shows the contribution of each of the independent variable to the dependent variables. The calculate value of t = -0.783, 2.931, -1.606, -2.094 with the associated exact probability value of 0.484, 0.032, 0.151, 0.068 for LTDE, STDE S G respectively show that only STDE contributes to the model. Other independent variables do not contribute to the model since their exact probability value is greater than alpha value (P>0.05). The- conclusion therefore follows that long -term debt to equity ratio has no significant relationship with the performance (Return on Equity-ROE) of Nigerian manufacturing firms, while the reverse is the case for short- term debt to equity ratio.

Hypothesis Two

H_{02}: Debt to equity ratio (short and long term debt to equity) have no significant relationship with the performance (Return on Assets-ROA) of Nigerian manufacturing firms.

H_{i2}: Debt to equity ratio (short and long term debt to equity) have significant relationship with the performance (Return on Assets-ROA) of Nigerian manufacturing firms.

Table 4: Contribution of each Dependent Variable in Model 2

MODEL	Unstandardized coefficients		Standardized coefficients		
	B	Std. Error	Beta	T	Sig
(constant)	99.073	17.930		5.608	0.000
LTDE	-0.039	0.035	-0.094	-1.130	0.310
STDE	0.085	0.030	0.378	2.857	0.019
S	-15.492	3.398	-0.686	-4.627	0.000
G	-0.080	0.036	-0.199	-2.270	0.049

a. Dependent Variable: ROA

The analysis of data in Table 4 shows the contribution of long term debt, short term debt, size and growth variable to return on assets. The calculate value of t = -1.130, 2.857, -4.627, -

2.270 with the associated exact probability value of 0.310, 0.019, 0.000, 0.049 for LTDE, STDE, S, G respectively shows that each of the variable contribute to the model except long-term debt whose exact probability value is greater than alpha value (P>0.05). It is therefore concluded that long -term debt to equity ratio has no significant relationship with the performance (Return on Assets-ROA) of Nigerian manufacturing firms, while the reverse is the case for short-term debt to equity ratio.

Hypothesis Three

H_{03}: Capital structure components do not contribute significantly to return on equity (ROE) in manufacturing firms in Nigeria.

H_{i3}: Capital structure components do contribute significantly to return on equity (ROE) in manufacturing firms in Nigeria.

Table 5: Test of significant relationship between return on equity and long term, short term debt, growth and size of firm

Model	Sum of squares	Df	Mean square	F	Sig
Regression	13127.172	4	3281.79	24.427	0.00
Residual	2686.924	20	134.35		
Total	15814.096	24			

a. Predictors: (constant), G, LTDE, STDE, S

b. Dependent Variable: ROE

Table 5 shows the analysis of test of significant relationship between return on equity and long term, short term debt, growth and size of firm. The obtained value of F (4, 20) = 24.427 is significant at exact probability value of 0.000 (P< 0.005), the null hypothesis is rejected and the conclusion follows that capital structure components contribute significantly to return on equity (ROE) in manufacturing firms in Nigeria.

Hypothesis Four

H_{04}: Capital structure components do not contribute significantly to Return on Asset (ROA) in Manufacturing firms in Nigeria.

H_{i4}: Capital structure components do contribute significantly to Return on Asset (ROA) in Manufacturing firms in Nigeria.

Table 6: Test of significant relationship between return on assets and long term, short term debt, growth and size of firm

Model	Sum of squares	Df	Mean square	F	Sig
Regression	1428.453	4	357.113	70.811	0.00
Residual	100.864	20	5.043		
Total	1529.317	24			

a. Predictors: (constant), G, LTDE, STDE, S

b. Dependent Variable: ROA

Table 6 shows the analysis of test of significant relationship between return on assets and long term, short term debt, growth and size of firm. The obtained value of F (4, 20) = 70.811 is significant at exact probability value of 0.000 (P< 0.005), the null hypothesis is rejected and the conclusion follows that capital structure components contribute significantly to return on asset (ROA) in manufacturing firms in Nigeria.

CONCLUSION AND RECOMMENDATIONS

This study has examined the impact of capital structure on the performance of selected Nigerian manufacturing firms, with a focus on both long-term and short-term debt components, alongside firm size and asset growth as control variables. Utilizing return on equity (ROE) and return on assets (ROA) as key performance indicators, and employing multiple regression analysis on data spanning sixteen years (2000–2024), the findings reveal nuanced insights into how capital structure influences firm performance. Empirical results indicate a consistently negative and statistically insignificant relationship between long-term debt to equity (LTD/E) ratio and both ROE and ROA, suggesting that reliance on long-term debt may not contribute positively to profitability for the firms studied. Conversely, a positive and significant relationship was observed between short-term debt to equity (STD/E) ratio and both performance measures, highlighting the potentially beneficial role of short-term financing in enhancing profitability, possibly due to lower cost and greater flexibility.

Interestingly, both control variables - firm size and asset growth - exhibited a negative relationship with performance, albeit insignificantly for ROE and significantly for ROA. These findings may reflect issues such as overtrading or inefficient asset utilization, especially in the context of the Nigerian manufacturing sector. Furthermore, the relatively high coefficients of determination for the regression models (83.0% for ROE and 93.4% for ROA) suggest that while capital structure does influence firm performance, other factors - such as management quality, macroeconomic conditions, and operational efficiencies - play significant roles as well.

In conclusion, while capital structure decisions are critical to firm performance, their effects are not uniform across all components or firms. Nigerian manufacturing firms should approach debt structuring with a nuanced understanding of their operational contexts and financial capacities. Short-term debt appears to offer more tangible benefits in enhancing profitability, but the overall capital structure must be aligned with firm-specific characteristics, including size, asset base, and strategic goals. Ultimately, optimal performance hinges not only on how capital is sourced but also on how effectively it is utilized within the firm.

Based on the empirical findings and analysis of the capital structure and performance of selected Nigerian manufacturing firms, the following recommendations are proposed:

1. Prioritize Short-Term Debt for Financing Needs: Given the study's finding of a positive and significant relationship between short-term debt to equity (STD/E) ratio and firm performance (measured by ROE and ROA), Nigerian manufacturing firms are advised to strategically prioritize short-term debt in their financing mix. However, this should be done with caution to avoid liquidity risk and to ensure the firm can meet its obligations as they fall due.
2. Exercise Caution in the Use of Long-Term Debt: The observed negative and insignificant relationship between long-term debt to equity (LTD/E) ratio and both ROE and ROA suggests that over-reliance on long-term debt may undermine firm profitability. Firms should therefore undertake rigorous cost-benefit analysis before assuming long-term liabilities, ensuring that such debt aligns with the firm's investment horizon and revenue-generating potential.
3. Adopt a Holistic Capital Structure Policy: The study shows that capital structure alone does not comprehensively explain firm performance, as evident in the high coefficients of determination (83.0% for ROE and 93.4% for ROA). Firms are therefore encouraged

to adopt a holistic financial management approach that includes other determinants of performance, such as internal control systems, workforce quality, operating environment, and strategic governance.

4. Strengthen Financial Planning and Investment Allocation: High profitability is attainable through efficient and effective utilization of funds. Firms must ensure that all funds—whether internally generated or externally sourced—are allocated prudently. This includes rigorous project appraisals, cost control mechanisms, and investment in value-enhancing activities that align with strategic goals.
5. Encourage Policy Interventions to Improve Capital Market Access: Policymakers and regulators should consider interventions aimed at improving access to a diverse range of financing instruments, particularly for manufacturing firms. Such initiatives could include incentives for equity financing, development of corporate bond markets, and policies that encourage responsible lending by financial institutions.

By implementing these recommendations, Nigerian manufacturing firms can enhance their financial performance, strengthen resilience, and contribute more robustly to industrial growth and economic development.

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