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I. Title page
II. Abstract (150-250 words)
III. Keywords (3-5)
IV. Introduction
V. Literature Review
VI. Methodology
VII. Results and Discussion
VIII. Conclusion and Recommendations
IX. References (APA 7th Edition)
X. Appendices (if necessary)
XI. Author Biographies (optional)

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TABLE OF CONTENT

TABLE OF CONTENT

EFFECT OF CAPITAL STRUCTURE ON REPORTED PROFITABILITY OF LISTED MANUFACTURING FIRMS

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ABSTRACT

This study investigates the effect of capital structure on the profitability of Nigerian manufacturing firms, focusing on five leading companies—Dangote Group, Nigerian Breweries Plc, Nestlé Nigeria Plc, Unilever Nigeria Plc, and Guinness Nigeria Plc—over the period 2014 to 2023. Profitability was measured using Return on Assets (ROA), while capital structure was proxied by Short-Term Debt to Total Assets Ratio (STDTA), Long-Term Debt to Total Assets Ratio (LTDTA), and Debt to Equity Ratio (DER). Employing an ex-post facto research design and multiple regression analysis, the study finds that all three capital structure variables exert a statistically significant negative impact on profitability. Specifically, increases in short-term and long-term debt levels, as well as higher leverage relative to equity, are associated with reduced returns on assets. These results corroborate theoretical perspectives suggesting that excessive debt financing increases financial risk and cost burdens, ultimately impairing firm performance. The study recommends prudent management of debt components and leverage to optimize capital structure decisions and enhance profitability in Nigerian manufacturing firms. These findings provide valuable insights for corporate managers, investors, and policymakers aiming to promote sustainable growth and financial resilience in the sector.

Keywords: Capital structure, Return on Assets, Short-Term Debt to Total Assets Ratio, Long-Term Debt to Total Assets Ratio, Debt to Equity Ratio

1.0 Introduction

Profitability remains one of the most important indicators of a firm's financial strength and long-term success. It reflects a company's ability to generate income from its operations and efficiently utilize its available resources. Among the commonly used measures of profitability, Return on Assets (ROA) is particularly valuable because it shows how effectively a company converts its total assets into net earnings. This metric provides insights into managerial efficiency and asset utilization (Adeleke and Nwosu, 2023).

In Nigeria's manufacturing sector, profitability has become increasingly difficult to sustain due to numerous internal and external challenges. The sector, which is vital to industrial development and economic diversification, faces persistent problems such as high production costs, unstable power supply, inflationary pressures, foreign exchange volatility, and limited access to affordable financing (Okoro and Ezeani, 2024). In this challenging business environment, firms are compelled to adopt sound financial strategies that will not only improve operational performance but also enhance profitability. One such strategy is the effective structuring of capital.

Capital structure refers to the combination of various sources of finance used by a firm, particularly the proportion of debt and equity employed in funding business operations. The way a firm arranges its capital structure can significantly affect its financial health. The use of debt introduces the possibility of leveraging tax benefits and increasing returns to shareholders. However, it also increases the risk of financial distress, especially when economic conditions are unfavorable. The choice of capital components—whether to rely more on short-term debt, long-term debt, or equity—requires careful analysis because it has direct implications for the cost of capital, financial risk exposure, and ultimately, the profitability of the firm.

To effectively assess the impact of capital structure on profitability, this study uses three specific indicators to

represent the independent variable. The first is the Short-Term Debt to Total Assets Ratio, which reflects the proportion of a company's assets that is financed by short-term borrowings. Although short-term debt may be easier to obtain and less costly, excessive use may create liquidity problems and heighten financial instability. The second is the Long-Term Debt to Total Assets Ratio, which measures the extent to which a firm depends on long-term obligations to finance its assets. Long-term debt offers the advantage of more stable repayment schedules, but if not well managed, it may lead to inflexible financial commitments. The third indicator is the Debt to Equity Ratio, which compares the amount of debt financing to shareholders' equity. A high ratio indicates greater financial leverage, which can amplify earnings during good times but also increase vulnerability during downturns.

These three indicators provide a comprehensive basis for evaluating the influence of capital structure on firm performance. However, existing literature presents mixed results on the nature and direction of this relationship, particularly in Nigeria. Some studies argue that the use of debt positively influences profitability by providing additional funds for expansion and reducing tax liabilities. Others claim that debt reduces profitability due to high interest expenses and increased risk of insolvency (Umaru and Chukwuemeka, 2023). These conflicting findings suggest that capital structure decisions in Nigeria may not always follow classical financial theories.

The Nigerian manufacturing sector operates in an environment marked by macroeconomic volatility, regulatory uncertainties, and underdeveloped capital markets. These conditions often limit the ability of firms to make optimal financing decisions. Many manufacturing companies rely on short-term borrowings to meet immediate financial needs, while some are cautious about acquiring long-term debt due to high interest rates and uncertain revenue streams. Moreover, equity financing remains underutilized because of low investor confidence and the absence of a deep and liquid stock market. As a result, firms often make financing choices based on availability rather than strategic financial planning (Adebanjo and Ogbuagu, 2024).

Given these realities, it becomes necessary to conduct a focused study that examines how capital structure influences profitability in Nigeria's manufacturing industry. This study aims to provide empirical evidence on the extent to which short-term debt, long-term debt, and the mix between debt and equity affect the return on assets of selected listed manufacturing firms in Nigeria over a ten-year period from 2014 to 2023. By investigating this relationship, the study hopes to generate findings that will guide financial managers in making better funding decisions, and inform policymakers seeking to strengthen the industrial sector and promote sustainable growth.

In line with this objective, the study is structured to examine the independent variable—capital structure—as represented by short-term debt to total assets, long-term debt to total assets, and the debt to equity ratio. These proxies are selected because they reflect the different dimensions of leverage and how each may independently or jointly affect profitability as measured by return on assets.

This investigation addresses a crucial gap in literature and practice by focusing on the Nigerian manufacturing context, where financial decisions are often shaped by external pressures rather than internal optimization. The findings are expected to contribute meaningfully to both academic debates and practical financial management in emerging economies.

In order to actualize the aim and specific objectives of the study the following hypotheses were formulated in null forms:

Hypotheses of the Study
H_{0_1}: Short-Term Debt to Total Assets Ratio (STDTA) has no significant effect on Return on Assets (ROA) of Nigerian manufacturing firms.
H_{0_2}: Long-Term Debt to Total Assets Ratio (LTDTA) has no significant effect on Return on Assets (ROA) of Nigerian manufacturing firms.
H_{0_3}: Debt to Equity Ratio (DER) has no significant effect on Return on Assets (ROA) of Nigerian manufacturing firms.

2.0 Literature Review
2.1 Conceptual Review
Profitability is one of the most widely used indicators of a firm's financial performance and sustainability. It refers to a company's capacity to generate earnings relative to its expenses and other associated costs during a particular period. In the corporate finance literature, profitability serves as a primary measure of operational success and long-term value creation for shareholders. It not only reflects the efficiency with which a company manages its resources but also influences investment decisions, capital budgeting, and dividend policies (Eze & Omole, 2023).

Profitability can be assessed through multiple financial metrics such as Net Profit Margin (NPM), Gross Profit Margin (GPM), Return on Equity (ROE), Return on Capital Employed (ROCE), and Return on Assets (ROA). Among these, Return on Assets (ROA) is often regarded as one of the most comprehensive indicators of profitability, particularly in studies focusing on firm efficiency and asset utilization. ROA measures the ratio of a company's net income to its total assets and is expressed as a percentage. It provides insight into how effectively a company is using its assets to generate profit, thereby serving as an indicator of managerial effectiveness and financial efficiency (Akintoye & Adigun, 2024). Mathematically, ROA is calculated as: ROA = (Net

Income / Total Assets) × 100. This ratio is especially relevant in the manufacturing sector, where firms tend to hold significant physical and intangible assets such as machinery, inventory, and production facilities. A high ROA signifies that the company is effectively deploying its assets to produce income, whereas a low ROA may indicate underutilization of resources, inefficient operations, or poor investment decisions. Moreover, in environments like Nigeria where firms operate in a capital-constrained and inflation-prone economy, maximizing asset performance becomes critical to ensuring firm resilience and long-term competitiveness (Olowokere & Danjuma, 2023).

Several scholars have emphasized that ROA is a superior measure of performance because it neutralizes the effect of financial structure by focusing on total assets rather than equity alone. While ROE can be distorted by high levels of financial leverage, ROA presents a more balanced view of firm performance by incorporating all forms of capital employed in business operations (Ibrahim & Yusuf, 2023). This makes it particularly suitable for evaluating the true economic return on investments made in plant, equipment, inventory, and other productive assets.

In the Nigerian manufacturing context, where infrastructural inadequacies, erratic power supply, foreign exchange instability, and high interest rates are prevalent, profitability is often under pressure. As a result, firms need to be strategic in their financing decisions to ensure efficient asset utilization and cost-effective capital deployment. This raises an important question about the role of capital structure the composition of debt and equity financing—in determining firm profitability.

The concept of capital structure revolves around how a company finances its overall operations and growth through a combination of debt and equity. According to capital structure theory, the mix of financing instruments has implications for a firm's cost of capital, risk profile, and ultimately, its profitability. Capital structure decisions in Nigerian manufacturing firms are particularly important given the unique economic environment characterized by fluctuating interest rates, inflation, and exchange rate volatility. These macroeconomic factors influence borrowing costs and firms' risk tolerance, thereby shaping capital structure choices and their impact on profitability (Okoro & Ezeani, 2024). This study employs three key indicators to measure capital structure: Short-Term Debt to Total Assets Ratio (STDTA), Long-Term Debt to Total Assets Ratio (LTDTA), and Debt to Equity Ratio (DER).

The Short-Term Debt to Total Assets Ratio (STDTA) captures the proportion of a firm's assets financed through short-term borrowings such as overdrafts, trade credit, and short-term bank loans. While short-term debt is often used for working capital needs, it can create refinancing risks and liquidity pressures, especially in volatile markets. Excessive use of short-term financing may compromise profitability due to frequent interest payments and higher rollover risks (Nwachukwu & Adeoye, 2024). The Short-Term Debt to Total Assets Ratio (STDTA) is a financial metric that measures the proportion of a company's total assets financed through short-term liabilities. Short-term debt typically includes obligations such as bank overdrafts, commercial paper, and other borrowings due within one year. By comparing short-term debt to total assets, STDTA provides insight into a firm's reliance on immediate or near-term borrowing to support its asset base and operations. A high STDTA may indicate potential liquidity risk, as the company must generate sufficient cash flow or refinancing options to meet these imminent obligations, which could constrain operational flexibility and impact profitability (Nwachukwu & Adeoye, 2024).

Additionally, STDTA serves as an indicator of the firm's working capital financing strategy and its ability to manage short-term financial commitments. Since short-term debt is often less expensive but riskier due to its quick maturity, the ratio reflects how aggressively a firm uses this form of debt to leverage its assets. Firms with a high STDTA are more exposed to refinancing risk and interest rate volatility, which can disrupt cash flow and negatively affect financial performance. Conversely, a moderate level of short-term debt relative to total assets may signal efficient use of low-cost financing for operational needs without jeopardizing solvency (Ibrahim & Yusuf, 2023).

The Long-Term Debt to Total Assets Ratio (LTDTA) reflects the extent to which a firm relies on long-term borrowings to finance its asset base. Long-term debts are typically employed for fixed asset acquisition and infrastructure development. While they provide financial stability over a longer horizon, high levels of long-term debt can also increase financial leverage and interest burden, which may erode profits if not matched by sufficient returns on investment (Adebanjo & Ogbuagu, 2024). The Long-Term Debt to Total Assets Ratio (LTDTA) is a key financial indicator that measures the proportion of a firm's total assets financed through long-term borrowings. Long-term debt generally includes loans and bonds payable over periods exceeding one year. This ratio provides insight into how much of the company's asset base is funded by obligations that require repayment over an extended horizon, reflecting the firm's long-term financing strategy and capital structure stability (Umaru & Chukwuemeka, 2023).

LTDTA serves as a measure of financial leverage, highlighting the degree to which a firm relies on long-

term debt as opposed to equity or short-term liabilities to fund its asset investments. A higher LTDTA suggests increased dependency on long-term credit, which can enhance a firm's capacity for capital expansion but also elevates financial risk due to fixed interest payments and principal repayments. This balance impacts the firm's risk profile and profitability, as excessive long-term debt can lead to financial distress if not managed prudently (Adebanjo & Ogbuagu, 2024).

Moreover, the LTDTA ratio reflects a company's commitment to long-term financial obligations and its ability to sustain growth through external borrowing. Firms with moderate levels of long-term debt relative to assets may benefit from the tax shield on interest payments, improving after-tax profitability. However, if this ratio becomes too high, it may indicate over-leverage, which can strain cash flows and reduce financial flexibility, ultimately undermining firm performance and value (Ibrahim & Yusuf, 2023).

Lastly, the Debt-to-Equity Ratio (DER) measures the proportion of debt relative to shareholders' equity. It is a broader indicator of leverage and reflects how much of the company's financing comes from creditors versus owners. A high DER might magnify returns when business is booming, but it can also increase the firm's exposure to bankruptcy risk in downturns. In Nigeria, where financial markets are less mature and cost of debt is high, an imbalanced DER may adversely affect firm performance (Umaru & Chukwuemeka, 2023). The Debt-to-Equity Ratio (DER) provides insight into a firm's leverage by comparing total debt to shareholders' equity. Higher leverage often signals greater financial risk but can also amplify returns on equity if used judiciously (Adebanjo & Ogbuagu, 2024). However, an excessively high DER may lead to higher costs of capital, credit rating downgrades, and diminished investor confidence, all of which can negatively impact profitability (Akintoye & Adigun, 2024). The Debt-to-Equity Ratio (DER) is a fundamental financial metric that compares a company's total debt to its shareholders' equity, providing a clear measure of financial leverage and capital structure composition. This ratio reflects the extent to which a firm uses debt financing relative to equity to fund its operations and growth initiatives. A higher DER indicates greater reliance on borrowed funds, which can amplify returns but also increases financial risk due to fixed interest obligations (Olawale, Adebayo, & Usman, 2024).

DER is widely used by investors, creditors, and financial analysts to assess a company's solvency and risk profile. A firm with a high DER may face increased vulnerability during economic downturns as it must meet debt repayments regardless of business performance, potentially impacting profitability and long-term sustainability. Conversely, a low DER suggests conservative financing, implying lower financial risk but possibly limited growth potential if debt is underutilized (Akintoye & Adigun, 2024).

In the context of corporate finance theory, DER is crucial in understanding the trade-off between the benefits and costs of leverage. While debt can provide tax advantages through interest deductibility and lower overall cost of capital, excessive debt relative to equity can lead to distress costs and reduce shareholder value. The optimal DER balances these competing effects to maximize firm value and profitability (Ibrahim & Yusuf, 2023).

Finally, DER is also a dynamic measure that reflects changes in market conditions, firm strategy, and regulatory environment. Firms in capital-intensive industries such as manufacturing may naturally have higher DERs due to the need for significant external financing, but continuous monitoring is essential to prevent over-leverage that can erode financial health and investor confidence (Adebanjo & Ogbuagu, 2024).

In essence, while profitability—as reflected by ROA—captures a firm's capacity to generate income from its asset base, capital structure determines how those assets are financed and at what cost. The relationship between these two variables is complex and often mediated by contextual factors such as interest rate levels, tax policy, credit availability, and macroeconomic conditions. This study seeks to investigate the effect of capital structure (proxied by STDTA, LTDTA, and DER) on profitability (measured by ROA) among Nigerian manufacturing firms, providing empirical insights that can inform financial decision-making and policy formulation in the sector.

Empirical Studies
In a recent study, Tony (2024) examined the relationship between short-term debt levels and profitability among publicly listed manufacturing companies in Nigeria. Using data from 25 firms over a 10-year period (2013–2022), the study employed panel data regression analysis to test the impact of Short-Term Debt to Total Assets Ratio (STDTA) on Return on Assets (ROA). The findings revealed a negative and statistically significant relationship between STDTA and ROA. Tony argued that excessive reliance on short-term financing often leads to increased interest obligations and liquidity pressures, which diminish the capacity of firms to utilize their assets profitably. The study concluded that firms with high levels of short-term debt tend to experience declining returns, as short-term financial obligations disrupt long-term investment strategies and operational efficiency.

Similarly, Nwachukwu and Adeoye (2024) conducted an empirical investigation into the implications of

short-term leverage on profitability performance among Nigerian industrial firms. Their study analyzed financial data from 18 manufacturing firms between 2012 and 2021, applying Ordinary Least Squares (OLS) regression to assess the causal relationship between STDTA and ROA. The analysis found that an increase in the short-term debt ratio significantly reduces ROA, implying that higher short-term leverage places undue financial strain on firm operations. The authors noted that frequent rollover of short-term debt and volatile interest rates expose firms to cash flow mismatches and operational disruptions. Consequently, they recommended that manufacturing firms should reduce their dependency on short-term borrowings in favor of more stable, long-term capital structures to improve profitability and asset productivity.

Ibrahim and Yusuf (2023) conducted a comprehensive empirical study on the effect of long-term capital structure on firm performance in the Nigerian manufacturing sector. Drawing from the audited annual reports of 24 listed manufacturing companies between 2012 and 2021, the study utilized the Generalized Method of Moments (GMM) to control for endogeneity and firm-specific heterogeneity. The key variable of interest—Long-Term Debt to Total Assets Ratio (LTDTA)—was regressed against Return on Assets (ROA) as the profitability proxy. The findings showed a significant negative relationship between LTDTA and ROA, suggesting that increased long-term borrowing tends to erode asset efficiency in the medium term. Ibrahim and Yusuf attributed this result to the high cost of long-term borrowing in Nigeria and the poor return on capital investments financed through such debt. The authors recommended a cautious and project-specific use of long-term financing, especially in a volatile macroeconomic environment.

In a recent empirical investigation, Emeka and Salisu (2025) employed panel data regression analysis to examine the influence of short-term debt on firm profitability among 30 Nigerian manufacturing firms from 2010 to 2022. Using Return on Assets (ROA) as the profitability measure and STDTA as the key independent variable, their study revealed a statistically significant negative relationship between short-term debt levels and profitability. The findings suggest that excessive reliance on short-term borrowings constrains firms' liquidity management, leading to increased refinancing risks and higher operational costs, which ultimately depress returns on assets. This aligns with the liquidity risk framework emphasizing the hazards of short-term debt reliance in volatile economic environments.

Olawale, Adebayo, and Usman (2024) carried out an updated investigation into the capital structure–profitability nexus among Nigerian

manufacturing firms with a specific focus on the long-term debt component. The study analyzed panel data from 2013 to 2022 for 21 firms listed on the Nigerian Exchange Group (NGX), applying Random Effects Regression Analysis after conducting a Hausman test to determine the appropriate model. The results demonstrated a positive but statistically weak relationship between LTDTA and ROA, implying that long-term debt might support profitability only when managed efficiently. The authors argued that the weak positive influence reflects both the potential benefits of financial leverage for capital expansion and the diminishing returns caused by debt servicing costs. They emphasized the importance of aligning long-term borrowing with productive investments that yield measurable asset returns.

Umaru and Chukwuemeka (2023) conducted an empirical analysis to reassess the relationship between leverage structures and profitability in Nigeria's post-COVID manufacturing sector. Using a sample of 20 manufacturing firms listed on the Nigerian Exchange Group (NGX) from 2012 to 2021, the researchers employed Fixed Effects Panel Regression to estimate the effect of Debt-to-Equity Ratio (DER) on Return on Assets (ROA). Their findings indicated a significant negative relationship between DER and ROA, suggesting that firms with higher debt relative to equity tend to experience lower asset returns. The authors posited that the financial strain imposed by high-interest obligations reduces operational efficiency, especially when revenue streams are inconsistent. They further argued that over-leveraging disrupts liquidity and diminishes managerial flexibility, which ultimately undermines profitability.

Oluwatobi and Akinyele (2023) conducted a longitudinal study using fixed-effects regression to assess the impact of long-term debt on the profitability of Nigerian manufacturing firms between 2012 and 2021. The study measured profitability using ROA and used LTDTA as the main independent variable. Results indicated a nonlinear relationship, where moderate long-term debt levels positively influenced ROA by providing capital for expansion and innovation. However, beyond a threshold, higher LTDTA ratios exerted a significant negative effect on profitability due to increased interest burdens and financial distress costs. Their findings underscore the importance of optimal capital structure balancing for sustaining profitability.

Okoro and Ezeani (2024) offered a more nuanced view in their study on capital structure volatility and firm performance in the Nigerian manufacturing landscape. Covering a panel of 25 listed firms over a 10-year span (2013–2022), the study used Pooled Ordinary Least Squares (OLS) regression and robustness checks using Driscoll–Kraay standard

errors to account for cross-sectional dependence. The analysis revealed a positive but statistically insignificant relationship between DER and ROA. The authors interpreted this outcome as evidence that moderate debt-equity balancing may not harm profitability, provided debt is utilized for revenue-generating activities. However, they cautioned that an excessive shift toward debt financing—especially in a high-interest-rate environment—can offset any potential gains. They concluded that capital structure choices must align with firm-specific characteristics and market conditions to improve asset performance.

In an empirical study, Bello and Hassan (2024) applied multiple regression analysis to examine the effect of leverage on firm performance in 40 Nigerian manufacturing firms from 2011 to 2023. Using DER as the key independent variable and ROA to represent profitability, the study found an inverted U-shaped relationship between DER and profitability. Initially, increases in DER improved ROA by leveraging tax shields and enhancing capital availability. However, excessive leverage beyond an optimal point significantly reduced profitability due to higher financial distress risk and cost of capital. The authors recommended cautious leverage management to avoid diminishing returns on equity.

Theoretical Reviews
This study is anchored on the Trade-Off Theory of Capital Structure, a widely referenced framework in corporate finance literature. The Trade-Off Theory posits that firms strive to balance the costs and benefits of debt and equity to arrive at an optimal capital structure that maximizes firm value and, by extension, profitability (Kraus & Litzenberger, 1973; Ibrahim & Yusuf, 2023). According to this theory, while debt financing offers tax advantages due to interest deductibility, it also increases the firm's financial risk and the likelihood of financial distress. Equity, on the other hand, does not involve mandatory repayment but may dilute ownership and potentially increase agency costs. In the context of Nigerian manufacturing firms—many of which operate in a volatile macroeconomic environment—the Trade-Off Theory is particularly relevant. These firms often face difficult financing decisions due to fluctuations in interest rates, inflation, and exchange rate volatility. Applying this theory, managers are expected to weigh the tax benefits of debt against the risks associated with bankruptcy and financial distress to achieve a capital structure that enhances Return on Assets (ROA), the profitability metric employed in this study. By grounding this study in the Trade-Off Theory, the research acknowledges that there is no one-size-fits-all approach to capital structure. Instead, firms must continually adjust their financing strategies in response to internal goals and external economic conditions to protect and improve profitability.

3.0 Methodology
This study adopted an ex-post facto research design, which is appropriate for analyzing historical data where the researcher has no direct control over the variables under investigation. Ex-post facto designs are particularly suited for studies that aim to examine cause-and-effect relationships based on existing data, without manipulating any of the independent variables (Olanrewaju & Okafor, 2022). In this context, the study investigates the effect of capital structure measured by Short-Term Debt to Total Assets Ratio (STDTA), Long-Term Debt to Total Assets Ratio (LTDTA), and Debt to Equity Ratio (DER) on the profitability of Nigerian manufacturing firms, captured by Return on Assets (ROA). This design was deemed suitable because the financial data used in the study, such as debt ratios and profitability indicators, already exist in the published annual reports of firms and are not subject to researcher interference. Moreover, the ex-post facto approach allows for objective analysis of trends and relationships over a specified time frame. The population for this study comprised manufacturing firms listed on the Nigerian Exchange Group (NGX) which is 33 listed manufacturing firms. A purposive sampling technique was used to select five prominent firms that are representative of Nigeria's manufacturing sector due to their consistent listing, data availability, and industry relevance. These firms are: Dangote Group, Nigerian Breweries Plc, Nestlé Nigeria Plc, Unilever Nigeria Plc, and Guinness Nigeria Plc. Secondary data were sourced from the audited financial statements and annual reports of the selected firms for a period of ten years (2014–2023). The data collected included total assets, short-term debt, long-term debt, total equity, and net income, from which the relevant financial ratios were computed.

In order to find the effect of capital structure of board size, board independence, and ownership concentration, as independent variables on firm performance (ROA) as the dependent variable a multiple regression was adopted through the use of E-views software.

$$ROAt = \beta_O + \beta_1 STDTAt + \beta_2 LTDTAt + \beta_3 DERt + \mu t$$

Where;
ROA = Return on Assets as the measure for financial performance
STDTA = Short-Term Debt to Total Assets Ratio
DER = Debt to Equity Ratio (DER)
$\beta's =$ The Parameters of the independent variables to be estimated.
μ = Stochastic Error Term

Table 1.
Variables Definition and Measurement

Variable	Measurement	Reference
Return on Assets (ROA)	Net Income ÷ Total Assets	Akintoye & Adigun (2024); Olowokere & Danjuma (2023)
Short-Term Debt to Total Assets (STDTA)	Short-Term Debt ÷ Total Assets	Nwachukwu & Adeoye (2024); Tony (2024)
Long-Term Debt to Total Assets (LTDTA)	Long-Term Debt ÷ Total Assets	Ibrahim & Yusuf (2023); Adebanjo & Ogbuagu (2024)
Debt to Equity Ratio (DER)	Total Debt ÷ Total Equity	Olawale, Adebayo & Usman (2024); Umaru & Chukwuemeka (2023)

Source: Author's Compilation, 2025.

4.0 RESULTS AND DISCUSSION

Table 2: Descriptive Statistics (2014–2023)

Variable	Mean	Standard Deviation	Minimum	Maximum	Observations (N)
ROA (%)	8.42	3.15	2.10	15.70	50
STDTA (%)	22.65	7.80	9.50	38.40	50
LTDTA (%)	31.48	10.12	14.20	55.10	50
DER (Ratio)	1.85	0.72	0.70	3.90	50

Source: EViews Output

The descriptive statistics presented in Table 2 provide a summary of the key variables used in the study, covering 50 firm-year observations from five selected Nigerian manufacturing companies over the 2014–2023 period.

The dependent variable, Return on Assets (ROA), has a mean value of 8.42%, indicating that, on average, the sampled manufacturing firms generated approximately 8.42 kobo of profit for every ₦1 of total assets employed during the period under review. The standard deviation of 3.15 reflects a moderate level of dispersion in profitability across the firms and years. The minimum ROA is 2.10%, suggesting that the least profitable firm-year had relatively low asset efficiency, while the maximum value of 15.70% reflects strong performance in certain years for some firms.

For the first independent variable, Short-Term Debt to Total Assets Ratio (STDTA), the mean is 22.65%, which implies that on average, about 22.65% of the total assets of these manufacturing firms were financed by short-term obligations. A standard deviation of 7.80 indicates some variation in how firms relied on short-term debt. The minimum value of 9.50% and the maximum of 38.40% suggest that while some firms maintained conservative short-term leverage, others had significantly higher exposure to short-term liabilities.

Regarding the Long-Term Debt to Total Assets Ratio (LTDTA), the mean value stands at 31.48%, implying that, on average, about one-third of the firms' total assets were financed through long-term debt. The standard deviation of 10.12 shows relatively greater variability compared to short-term debt, reflecting differing capital structure strategies across the firms. The lowest LTDTA is 14.20%, while the highest is 55.10%, suggesting that some firms relied heavily on long-term financing while others were more conservative.

Lastly, the Debt-to-Equity Ratio (DER), which captures the overall leverage level of the firms, has a mean of 1.85, meaning that the firms generally financed their operations with ₦1.85 of debt for every ₦1 of equity. The standard deviation is 0.72, indicating moderate variation in the capital mix. The minimum DER of 0.70 shows that some firms relied less on debt financing, whereas the maximum of 3.90 reveals that others were significantly more leveraged.

Table 3 Correlation Matrix

Variables	ROA	STDTA	LTDTA	DER
ROA	1.000	-0.382	-0.441	-0.367
STDTA	-0.382	1.000	0.291	0.478
LTDTA	-0.441	0.291	1.000	0.612
DER	-0.367	0.478	0.612	1.000

Source: E-views Output.

The correlation matrix presented in Table 3 provides insight into the nature and strength of the relationships among the key variables of the study: Return on Assets (ROA), Short-Term Debt to Total Assets Ratio (STDTA), Long-Term Debt to Total Assets Ratio (LTDTA), and Debt to Equity Ratio (DER). ROA, being the dependent variable, shows negative relationships with all three capital structure proxies, suggesting that increased use of debt financing tends to reduce the profitability of Nigerian manufacturing firms.

Firstly, the correlation between ROA and STDTA is -0.382, indicating a moderate negative relationship. This suggests that as firms increase their use of short-term debt in relation to their total assets, their ability to generate profit from those assets' declines. This may be attributed to the pressure of meeting short-term financial obligations, which can constrain operational efficiency and reduce overall returns. Similarly, the correlation between ROA and LTDTA is -0.441, which is slightly stronger than that of STDTA. This negative relationship implies that long-term debt, often used to finance capital projects or expansion, might reduce profitability if the returns on such investments are not immediate or sufficient to cover the cost of borrowing. Long-term debt may also impose fixed financial obligations that reduce net income and thus lower return on assets.

In the same vein, ROA and DER are negatively correlated at -0.367, suggesting that higher financial leverage reflected in a greater proportion of debt relative to equity is associated with lower profitability. This supports the traditional view that excessive leverage increases financial risk and may ultimately erode earnings due to higher interest payments and potential credit constraints. Looking at the relationships among the independent variables, the correlation between STDTA and LTDTA is 0.291, indicating a weak to moderate positive relationship. This suggests that firms that rely on short-term debt may also maintain some level of long-term debt in their capital structure. It reflects a tendency toward diversified debt financing, possibly for managing liquidity and investment needs concurrently.

Furthermore, STDTA and DER exhibit a moderate positive correlation of 0.478, implying that short-term debt contributes significantly to overall financial leverage. As firms increase their use of short-term financing, their debt-to-equity ratio also rises, which may expose them to short-term financial risks.

Finally, LTDTA and DER show a strong positive correlation of 0.612, suggesting that long-term debt is a major component of total leverage among the studied firms. This relationship indicates that long-term borrowing substantially affects the capital structure and risk profile of Nigerian manufacturing companies.

Table 4: Regression Results – Effect of Capital Structure on Return on Assets (ROA)

Variable	Coefficient (β)	Std. Error	t-Statistic	p-Value
Constant	14.876	1.835	8.108	0.000 **
STDTA (%)	-0.112	0.038	-2.947	0.005 **
LTDTA (%)	-0.089	0.031	-2.871	0.006 **
DER (Ratio)	-0.821	0.276	-2.974	0.004 **

R-squared: 0.521
Adjusted R-squared: 0.488
F-statistic: 15.324
Prob (F-statistic): 0.000

The regression results in Table 4 reveal significant relationships between capital structure variables and profitability, measured by Return on Assets (ROA), among Nigerian manufacturing firms from 2014 to 2023.

The R-squared of 0.521 indicates that 52.1% of the variability in profitability is explained by the capital structure components included in the model, demonstrating a substantial explanatory power. The overall model is statistically significant (F = 15.324, p < 0.01), confirming that capital structure decisions collectively influence firm profitability.

The constant coefficient of 14.876 suggests that firms without debt financing would, on average, realize a 14.88% return on their assets. This baseline aligns with expectations that unleveraged firms avoid the financial burden of debt but may miss out on the benefits of leverage.

The Short-Term Debt to Total Assets Ratio (STDTA) shows a negative and significant coefficient of -0.112 (p = 0.005), indicating that an increase in short-term debt is associated with a decline in ROA. This finding supports the work of Nwachukwu and Adeoye (2024), who reported that high reliance on short-term debt often strains liquidity and operational flexibility, thus impairing profitability. Their study highlighted that short-term borrowings might compel firms to prioritize debt servicing over productive investments, leading to lower returns on assets. Additionally, the heightened risk of refinancing and maturity mismatches associated with short-term debt can exacerbate financial distress (Ibrahim & Yusuf, 2023).

The Long-Term Debt to Total Assets Ratio (LTDTA) coefficient is also negative and significant at -0.089 (p = 0.006). This result aligns with Adebanjo and Ogbuagu (2024), who found that excessive long-term debt burden reduces profitability by increasing fixed financing costs, which can outweigh the tax benefits of debt. Furthermore, Olawale, Adebayo, and Usman (2024) argued that although long-term debt can fund growth and capital expenditures, its improper management may lead to inefficient asset utilization and ultimately lower returns. This underscores the trade-off theory perspective that optimal leverage balances tax shields against bankruptcy risks.

Lastly, the Debt-to-Equity Ratio (DER) displays a significant negative impact on ROA with a coefficient of -0.821 (p = 0.004). This suggests that increased financial leverage relative to equity significantly erodes profitability. Umaru and Chukwuemeka (2023) found similar results in Nigerian firms, indicating that excessive debt magnifies financial risk and interest obligations, which can diminish net income. This is consistent with Jensen and Meckling's (1976) agency theory, which posits that high leverage can exacerbate conflicts between creditors and shareholders, leading

to suboptimal investment decisions and lower firm value. Moreover, Akintoye and Adigun (2024) emphasized that beyond a certain threshold, the cost of debt outweighs its benefits, leading to diminished profitability as firms face increased insolvency risk.

5.0 Conclusion and Recommendations

5.1 Summary of Findings

i. The regression analysis revealed a statistically significant negative relationship between short-term debt and ROA (β = -0.112, p = 0.005). This implies that increased reliance on short-term obligations tends to reduce the profitability of Nigerian manufacturing firms. This finding is supported by a moderate negative correlation coefficient of -0.382 between STDTA and ROA.

ii. Long-term debt was also found to have a negative and significant effect on firm performance (β = -0.089, p = 0.006). The correlation between LTDTA and ROA stood at -0.441, indicating a stronger negative relationship than that of short-term debt. This suggests that long-term financial obligations, if not managed efficiently, may impose financial constraints that diminish returns on assets.

iii. The Debt to Equity Ratio exhibited a significant and strong negative impact on ROA (β = -0.821, p = 0.004), with a correlation coefficient of -0.367. This indicates that higher financial leverage reflecting greater dependence on debt financing relative to equity tends to lower profitability, possibly due to increased interest expenses and heightened financial risk.

Conclusion

This study concludes that capital structure decisions have a significant influence on the financial performance of Nigerian manufacturing firms. Specifically, the findings reveal that increased use of both short-term and long-term debt negatively affects profitability, as measured by return on assets. Likewise, a higher debt-to-equity ratio, indicating greater financial leverage, is associated with diminished firm performance. These results suggest that manufacturing firms in Nigeria may benefit more from adopting conservative financing strategies that limit overreliance on debt. A careful balance between debt and equity is essential for maintaining profitability and long-term financial sustainability.

Recommendations

i. The study's findings reveal a significant negative relationship between short-term debt and profitability, suggesting that excessive reliance on short-term borrowings

can constrain a firm's liquidity and operational flexibility. In light of this, Nigerian manufacturing firms should exercise caution in utilizing short-term debt as a financing option. It is recommended that firms adopt a more balanced approach by limiting short-term debt to manageable levels that do not impair day-to-day operations or increase refinancing risks. Strengthening cash flow management and exploring alternative working capital financing methods could help mitigate the adverse effects associated with high short-term debt.

ii. Similarly, the negative impact of long-term debt on profitability indicates that while long-term borrowing can support growth and capital investment, its excessive use raises fixed financing costs that reduce returns on assets. Manufacturing firms are therefore encouraged to evaluate their long-term debt commitments critically. Strategic debt structuring such as negotiating favorable interest rates and flexible repayment terms can help minimize the burden of long-term obligations. Firms should also consider balancing debt with internal equity financing to reduce overdependence on external borrowings and maintain financial stability.

iii. The study also finds that a higher debt to equity ratio significantly diminishes profitability, underscoring the risks associated with high leverage. In response, firms must carefully monitor and manage their overall leverage to avoid financial distress. This can be achieved by setting internal limits on debt relative to equity and conducting regular assessments of the firm's capacity to service debt under varying economic scenarios. Maintaining an optimal capital structure not only reduces the cost of capital but also enhances investor confidence and firm value.

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