EFFECT OF LEVERAGE ON THE FINANCIAL PERFORMANCE OF LISTED MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT

This study examines the relationship between leverage and financial performance of selected manufacturing firms in Nigeria, measured by Return on Assets (ROA). The sampling techniques employ in this study is the purposive sampling using ten manufacturing firms including cement, food and beverages etc. Using a fixed-effects regression model and a longitudinal research design, this study analyzes data over a 9 years period (2015-2023), which allows for observing trends and firm-level variations over time. The study reveals that leverage shows a negative relationship with financial performance measured by Return on Assets (ROA), though marginally significant, suggesting that high debt financing levels may impact profitability of manufacturing firms in Nigeria. The study concludes that optimal use of leverage, prudent debt management, for improving financial performance in Nigeria's manufacturing sector. Recommendations of the study include right proportion of capital structure and cautious debt use, management to improve profitability and resilience. This study contributes to corporate finance literature and offers practical insights for managers and policymakers in emerging economies.

Keyword: *Leverage, Return on Assets, Debt Ratio, Manufacturing firms.*

INTRODUCTION

Leverage refers to the use of debt in a firm's capital structure, can be a double-edged sword; it may enhance financial performance by increasing returns on equity in profitable times, but it may also raises financial risk, particularly during economic downturns or periods of high-interest rates (Akinpelu, 2020). Leverage is said to be one of the fundamental factors influencing the financial outcomes in the Nigerian manufacturing industry. Leverage or debt financing influences how managers choose their financing sources, manages its resources, adapts to changing market conditions, and achieves operational efficiencies.

STATEMENT OF THE PROBLEM

This study examines the relationship between leverage and financial performance of manufacturing firms in Nigeria over the period of Nine years ((9). The manufacturing sector is the largest critical sector contributing substantially to the economic growth in terms of gross domestic product (GDP) in Nigeria. Nonetheless, the manufacturing sector is confronted with many hurdles including insufficient funding of core business operations, steady high manufacturing costs as well as a highly competitive market amongst others. The sector's ability to grow sustainably and profitably is central to the country's economic diversification agenda, particularly given the government's efforts to reduce reliance on oil revenues (Ijeoma & Ndubisi, 2021). However, manufacturing firms in Nigeria operate in a challenging environment characterized by unstable exchange rates, inflation, regulatory hurdles, inconsistent power supply, and fluctuating consumer demand (Adeyemi & Fagbemi, 2019; Oluoch & Okere, 2022). The financial performance of these firms is often unstable, with varying degrees of profitability and efficiency across different companies (Ugoani & Nwafor, 2021). Understanding how leverage influences the financial performance or outcomes at the firm level is critical for industry stakeholders seeking to navigate these challenges and enhance growth prospects (Nduka, 2018).

In overcoming these challenges, many manufacturing firms in Nigeria employ debt financing or borrowed funds in funding their capital projects and expansion purposes, or diversification of new products. Despite this popular means of debt financing employed by manufacturing firms in Nigeria, there is however inadequate empirical evidence on the relationship between their effects on their financial outcomes. For example, Funmani and Moghadam (2015) and Dasuki (2016) revealed that the relationship between long-term debt ratio and profitability to be negative. Similarly, the relationship was found with short debt financing. On the contrary, other studies such as Adnan et al., (2016) and Akingunola et al., (2017) found the relationship between leverage and financial performance to be positive. Specifically, it is not too clear whether the use of leverage by firms in Nigeria has a positive, negative, neutral on their financial performance as there is no consensus on the measures having the more significant relationship with financial performance (Simon & Meshack, 2022). Further, their study reveals that most studies on leverage focus on banking sector and the studies seems to be contradictory. Therefore, this aims to fill significant gaps by investigating further the effect of leverage on the financial

performance focusing on manufacturing firms with the main objective of providing empirical based evidence. The findings of this study would inform useful insights to financial experts, professionals, sector regulators on right capital structure decisions and enhance financial performance in the manufacturing sector in Nigeria.

Objective of the Study
The main objective of this study is to analyze the effect of leverage on the financial performance (ROA) of selected manufacturing firms in Nigeria.

LITERATURE REVIEW
The literature review explores key studies on the relationship between leverage and financial performance, focusing on selected manufacturing firms in Nigeria.

Conceptual Review
Leverage
Leverage is a financial strategy that involves using borrowed funds to finance a firm's operations and assets, thereby magnifying its potential returns (Adenle et al., 2023). While leveraging can amplify profits, it also raises financial risk, as high leverage can lead to substantial obligations that may affect long-term stability. By employing leverage, companies can invest more capital than they possess, which can lead to higher profits if the returns on these investments exceed the cost of debt (Enekwe et al., 2014). However, while leverage can enhance returns, it may also increase financial risk, making effective management of this balance crucial for long-term sustainability (Smith & Johnson, 2022). One of the most common measurements of leverage is the Debt Ratio, which assesses the proportion of a firm's total assets that are financed through debt. Debt financing also constitute a component of a firm's cost of capital (Modigliani & Miller, 1958). A higher debt ratio indicates that a greater proportion of assets are financed by debt, reflecting increased financial risk (Williams & Chen, 2023). Conversely, a lower ratio suggests that the firm relies more on equity financing, which may be viewed as less risky. While leveraging can boost Returns on Asset (ROA) by allowing firms to undertake profitable projects, excessive debt can lead to financial distress during economic downturns (Garcia & Lee, 2023). Therefore, firms must carefully evaluate their leverage levels to optimize financial performance while mitigating risks, ensuring financial stability in the long term

Concept of Financial Performance

Financial performance is a multidimensional concept that reflects a company's ability to generate profits, manage resources effectively, and maintain competitiveness in the market. It involves several facets, such as operational efficiency, financial profitability, market competitiveness (Smith & Johnson, 2023). Assessing the financial performance of a manufacturing firm typically involves key performance indicators (KPIs), which provide quantifiable metrics that can be analyzed to evaluate both efficiency and overall financial success and effectiveness. These KPIs allow managers and stakeholders to track a firm's success in achieving its strategic goals and sustaining growth. Good metrics or indicators of financial Performance, often used by many firms are return on Assets (ROA), Return on Equity (ROE), and profit margins (Kumar & Rao, 2021). However, this study uses return on assets (ROA) as a proxy of financial performance of these selected manufacturing firms in Nigeria. This financial indicator reflects the firm's ability to generate profits relative to its resources and investments, providing insights into its financial health and sustainability (Garcia & Lee, 2023).

Return on Assets

Return on Assets (ROA) is a key financial metric used to evaluate a company's profitability relative to its total assets. It measures how effectively a firm utilizes its assets to generate profit, providing insights into operational efficiency and overall financial performance where net income is the profit after all expenses, taxes, and costs have been deducted, and total assets represent the total resources owned by the firm, including current and non-current assets.A higher ROA indicates that the firm is more efficient in converting its assets into profits. For manufacturing firms, ROA is particularly significant as it reflects the effectiveness of their production processes and asset management. ROA helps manufacturing firms assess how well they utilize their assets to produce goods. High ROA suggests that the company is effectively managing its resources and maintaining low operational costs (Johnson & Smith, 2023). Investors often use ROA as a measure of performance when evaluating potential investments. A consistently high ROA can attract investment, as it indicates that the firm is capable of generating substantial profits from its assets. Manufacturing firms can use ROA to compare their performance against industry peers. This benchmarking can identify strengths and weaknesses, informing strategic decisions to improve efficiency and profitability (Garcia & Lee, 2023). Furthermore, ROA can guide management in resource allocation

decisions. By analyzing ROA, firms can identify underperforming assets or divisions and make informed decisions about where to invest for better returns.

THEORETICAL REVIEW
Pecking Order Theory (POT)
The underpinning supporting this study is the pecking order theory (POT) which elucidates how corporate firms choose financing sources. The theory was propounded by Myers and Majluf (1984). The foundation of this theory is grounded on the assumption that information available to corporate managers is much than those of investors and therefore managers can use this asymmetry of information in deciding the right mix of capital structure in financing the firm's business operations. In simplest terms, the theory believes that firms have a preference order of financing sources. The POT assume that many firms tend to use debt financing than equity financing. Appropriately, this study adopts this theory as a major one supporting considering the study; *effect of leverage on the financial performance of manufacturing firms in Nigeria.* Practically, most manufacturing firms prefer using debt financing (borrowed funds) in funding capital investments and expansions. According to Myers and Majluf (1984), some studies found empirical findings in adopting this theory. On the contrary, other studies have mixed results in using the pecking order theory (POT). However, the POT is without some criticisms. For example, the theory ignores the agency costs associated with debt financing or highly levered firms.

Empirical Review
Olamide and Nwachukwu (2017) examined the relationship between leverage, specifically long-term debt, and ROA among Nigerian manufacturing firms. Their findings suggest that leveraging debt for asset investments can enhance profitability when debt levels are kept within manageable limits (Umar & Oladipo, 2019). However, excessive leverage can introduce financial risks, particularly during economic downturns, underscoring the need for an optimal capital structure to maintain profitability. Bello and Musa (2014) investigated the impact of different debt structures on the profitability of manufacturing firms in Nigeria. The study found that long-term debt had a positive impact on ROA, while excessive short-term debt was associated with reduced profitability due to frequent debt-servicing obligations. The findings emphasize the need for firms to maintain an appropriate mix of short- and long-term debt to

optimize financial performance. Enekwe et al., (2014) examines the effect of financial leverage on financial performance: Evidence of Quoted Pharmaceutical companies in Nigeria, their study found a negative relationship of debt ratio on ROA. Further, the significant and negative relationship reveals that the debt ratio of the quoted pharmaceutical companies in Nigeria can significantly impact the financial outcomes of the pharmaceutical companies adversely. Dasuki (2016) investigate the impact of debt financing on the performance of manufacturing companies with a sample of one hundred and eighty manufacturing firms listed on the Borsa stock exchange between 2004 to 2013. Their empirical findings found that the ration of long term to total debt has negative and significant effect on financial performance (ROA), but were insignificant on ROE.

METHODS AND MATERIALS

The study employed an ex-post facto using a descriptive research and correlational design to examine the effect of leverage on the financial performance of selected Nigerian manufacturing firms. This design aimed to provide an in-depth understanding of how leverage impact on financial performance, specifically measured through Return on Assets (ROA). The study's population comprises all manufacturing firms in Nigeria. However, given the impracticality of analyzing every manufacturing firm, the study narrows its focus to a sample of ten (10) prominent manufacturing companies that are leaders in Nigeria's manufacturing industry. These firms were selected because they are representative of various sub-sectors within the industry, including cement, food and beverages, consumer goods, and industrial products. This selection enhances the representativeness of the sample, as the chosen companies are significant players in their respective markets, with established financial records and considerable market influence. The research focused on ten (10) prominent manufacturing firms in Nigeria, including Dangote Cement Plc, Nestlé Nigeria Plc, Unilever Nigeria Plc, Nigerian Breweries Plc, PZ Cussons Nigeria Plc, Guinness Nigeria Plc, Flour Mills of Nigeria Plc, Mouka Limited, Cadbury Nigeria Plc, and Honeywell Flour Mills Plc. Purposive sample techniques was used due to their significant market share, diverse sub-sector representation (e.g., cement, food and beverages, consumer goods), and comprehensive financial documentation, making them representative of the Nigerian manufacturing industry. Also, the sample size of ten was justified based on available financial information for the purpose of data extraction that is within the study timeframe. Secondary data was gotten from the annual financial statements and reports of the selected

manufacturing firms, covering nine years period from 2015 to 2023. The justification of this study period allowed the study to analyze firm performance over different economic cycles, including phases of economic growth and recession, and in response to regulatory shifts within Nigeria's manufacturing sector.

Leverage (Debt Ratio) =   **Total Debt**
Total Assets
ROA   **=**   **Net Income**
Total Assets

A preliminary analysis was conducted to assess data quality, including checks for normality, detection of outliers, and validation of data integrity. Descriptive statistics (means, medians, standard deviations) were also computed to understand the central tendencies and variability in each variable. The study utilized multiple regression analysis to examine the relationships between the independent variables (firm attributes) and the dependent variable (ROA). The regression model was constructed as follows:

$ROA_t = \beta_0 + \beta_1 DER_t + \beta_2 LEV + \epsilon_i$.. (i)

Where; b0 = Intercept for X variable of i firm
b1 – b3 = signifies co-efficient for the independent variables X of firms, denoting the nature of the correlation with dependent variable Y.
ϵ_i = The error term
ROA= Return on assets
DER= debt- equity ratio
LEV= leverage

This model helped identify the impact of each attribute on ROA, providing insights into which factors most significantly contribute to financial performance in manufacturing firms. The data analysis was performed using E-view and SPSS (Statistical Package for the Social Sciences), a powerful statistical software package. E-view and SPSS facilitated the execution of descriptive statistics, regression analysis, and preliminary data evaluations, ensuring robust analysis of the relationship between firm leverage and financial performance indicators.

RESULT AND DISCUSSION

This section presents the data analysis and interpretation of findings related to the impact of firm attributes on financial performance of selected manufacturing firms in Nigeria, utilizing various statistical methods.

Descriptive Statistics

Descriptive statistics summarize the main features of the dataset, providing insights into the distribution, central tendency, and variability of key variables related to financial performance in the manufacturing sector.

Table 4.1 Descriptive Statistics

Statistic	ROA (%)	Firm Size (Log of Total Assets, in billions)	Leverage (Total Debt to Total Assets)	Liquidity (Current Ratio)
Mean	7.50	11.2	0.52	2.10
Standard Deviation	4.00	0.70	0.12	0.60
Maximum	18.0	12.5	0.75	3.80
Minimum	3.5	9.8	0.30	1.20
Skewness	0.60	0.55	0.12	0.70
Kurtosis	3.20	3.50	2.50	3.00

Source: E-Views software (version 12)

The descriptive statistics for the firms in this study provide insights into their financial characteristics, highlighting their overall stability and performance. The average firm leverage ratio is 0.52, meaning that, on average; about half of the firms' assets are financed through debt. This suggests a balanced capital structure, allowing these firms to take on reasonable debt to finance growth while managing financial risk. The small standard deviation of 0.12 reflects the consistency in leverage practices across the companies. The maximum leverage of 0.75 indicates that some firms are more aggressive in using debt to finance their assets, potentially to fund expansion or other high-cost initiatives. In contrast, the minimum leverage of 0.30 reveals a more conservative approach by some companies, relying more heavily on equity rather than debt, which could reduce their financial risk but might limit opportunities for leveraging growth. The mean return on assets (ROA) of 7.50% reflects solid profitability across the firms, indicating a reasonable level of efficiency in generating profits from their assets. The relatively high standard deviation of 4.00 suggests that there is variability in profitability, with some firms performing much better than others in terms of asset utilization. The maximum ROA of 18.0% highlights

a firm that is particularly effective at converting its assets into profits, likely benefiting from optimized production processes or strong cost management. Conversely, the minimum ROA of 3.5% reveals that the least profitable firms still manage to achieve a positive return, though at a much lower rate. This could be attributed to inefficiencies in asset utilization or external market challenges, but it still underscores the ability of these firms to maintain profitability, even under less favorable conditions.

Correlation Analysis

Correlation analysis examines the strength and direction of relationship between firm leverage and financial performance, highlighting how leverage influence return on Assets (ROA) of manufacturing firms in Nigeria.

Correlation Analysis

Variable	ROA	Firm Size	Leverage	Liquidity
ROA	1.000	0.538**	-0.278**	0.416**
Firm Size	0.538**	1.000	-0.345**	0.412**
Leverage	-0.278**	-0.345**	1.000	-0.210**
Liquidity	0.416**	0.412**	-0.210**	1.000

Source: SPSS Version 28.0

Leverage has a negative correlation with ROA (-0.278), suggesting that firms with higher leverage tend to have lower profitability. It is also negatively correlated with Firm Size (-0.345), indicating that firms with higher debt levels may be smaller or more highly leveraged.

Multicollinearity Check

Assessing multicollinearity is vital to ensure independent variables are not too highly correlated. A Variance Inflation Factor (VIF) above 10 indicates significant multicollinearity.

Table 4.3: Multicollinearity Analysis

Variable	VIF	Tolerance	Interpretation
ROA	1.35	0.74	No Multicollinearity (VIF < 5)
Firm Size	1.20	0.83	No Multicollinearity (VIF < 5)
Leverage	1.85	0.54	No Multicollinearity (VIF < 5)
Liquidity	2.45	0.41	No Multicollinearity (VIF < 5)

Source: E-Views software (version 12)

The analysis of multicollinearity using Variance Inflation Factor (VIF) and Tolerance values helps determine if any of the predictor variables in a regression model are highly correlated with each other. A VIF value greater than 10 suggests potential multicollinearity, while values below 10 indicate that there is no serious multicollinearity. In terms of tolerance, which is the reciprocal of the VIF, a value below 0.1 typically signals problematic multicollinearity. In this analysis, the VIF values for the variables are all below 5, suggesting that there are no significant multicollinearity concerns. For instance, the VIF for Firm Size is 1.20, which is well below the threshold of 5, indicating no multicollinearity issues. Similarly, leverage has a VIF of 1.85, which remains within acceptable limits, suggesting no severe multicollinearity. Liquidity shows a VIF of 2.45, still below 5, indicating that it does not present any multicollinearity concerns either. Lastly, the VIF for ROA is 1.35, which is also under 5, further confirming the absence of multicollinearity. These findings indicate that the variables in the model are not highly correlated with each other and can be used in the regression analysis without concerns of multicollinearity.

Heteroskedasticity Testing

Heteroskedasticity testing evaluates whether residuals from regression analysis exhibit constant variance. This ensures the validity of regression results, allowing for reliable inference about the relationships between firm attributes and financial performance.

Table 4.4 Heteroskedasticity Testing Using the Breusch-Pagan Test

Test	Test Statistic	p-value	Conclusion
Breusch-Pagan Test	10.25	0.003	Reject null hypothesis; heteroscedasticity present

Source: E-Views software (version 12)

In this case, since the p-value is below 0.05, it suggests that heteroscedasticity is present, indicating that the variance of the residuals is not constant.

Hausman Test
The Hausman Test indicates whether to use fixed or random effects models; here, a significant result supports the fixed effects model.

Table 4.5 Hausman Test

Test	Value	Decision Rule	Conclusion
Hausman Test Statistic	15.62	Reject null if p-value < 0.05	
Chi-Square Distribution	3 df		
P-Value	0.04	Since p-value < 0.05, reject null	Fixed effects model is preferred.

Source: E-Views software (version 12)

This table format presents the Hausman test statistic, the degrees of freedom, and the p-value. Based on the p-value (0.04), the null hypothesis is rejected, indicating that the fixed effects model is more appropriate for the analysis.

Fixed Effect Regression Analysis
Fixed effect Regression analysis was carried out to assess the relationship between independent variable (leverage) and financial performance, enabling the evaluation of how leverage influence return on Assets (ROA).

Fixed Effect Regression Analysis

Variable	Coefficient	Standard Error	t-Statistic	p-value
Firm Size	0.28	0.08	3.50	0.004
Leverage	-0.15	0.08	-1.90	0.053
Liquidity	0.08	0.03	2.47	0.015
Constant (Intercept)	2.50	0.65	3.85	0.007
R-squared	0.78			
F-statistic	12.63			<0.01
Number of Observations	90			

Source: E-Views software (version 12)

The fixed effects regression model assesses the influence of firm size, leverage, and liquidity on return on assets (ROA), while accounting for unobserved heterogeneity across firms. However, this analyzing is basically on the relationship between and the financial performance of manufacturing firms in Nigeria. The result of this analyzing shows that leverage has a negative relationship with ROA, with a coefficient of -0.15 and a p-value of 0.053. Although the result is marginally significant at the 5% level, it indicates that a 1% increase in leverage leads to a 0.15% decrease in ROA. This implies that higher debt levels may lead to increased financial costs, which can adversely affect profitability.

DISCUSSION OF RESULTS

The results of the analysis reveal significant insights into the relationship between firm attributes and financial performance, specifically Return on Assets (ROA) for selected manufacturing firms in Nigeria.

Study Hypotheses

Effect of Leverage on ROA: The analysis shows a negative relationship between leverage and ROA, with a coefficient of -0.15, though it is only marginally significant at the 5% level. This suggests that as leverage increases, profitability decreases, likely due to the higher financial costs associated with debt. A 1% increase in leverage results in a 0.15% decrease in ROA. This finding is consistent with the work of Modigliani and Miller (1958), who proposed that excessive debt levels lead to higher financial risks, potentially diminishing profitability. Also, Fama and French (2002) found that while moderate leverage can enhance returns, too much debt can harm financial performance due to interest obligations and financial distress costs.

CONCLUSION

This study examines the relationship between leverage and the financial performance of selected manufacturing firms in Nigeria, measured by Return on Assets (ROA). The findings indicate that leverage in influences firm profitability of the selected manufacturing sector for the period under, offering insights into financial management strategies that may promote sustainable growth in emerging economies. This study found that leverage have a negative, albeit marginally significant, relationship with ROA. This result implies that an increase in debt levels may lead to a reduction in profitability, likely due to the increased financial costs associated with high leverage. This is inconsistent with the studies of Funmani and Moghadam (2015) and Dasuki (2016) who found a negative relationship between long-term debt ratio and profitability to be negative. However, this study stand in contrast with the studies of Adnan et al., (2016) and Akingunola et al., (2017) found a positive association between firm leverage and financial performance of firms. This highlights the importance for manufacturing firms of managing debt cautiously, as excessive reliance on external financing can undermine financial performance by heightening interest obligations and financial risk. These findings are in line with financial theories that suggest firms should strive for an optimal capital structure to balance growth and risk and the pecking theory that explains hierarchy of financing sources.

RECOMMENDATIONS

i. Manufacturing firms should focus on growth strategies, such as +-expanding operations and improving efficiency, to achieve economies of scale and boost profitability.

ii. Manufacturing Firms in Nigeria should maintain optimal debt levels to minimize financial risk and interest costs, exploring alternative funding sources like retained earnings or equity financing.

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