

# Debt Financing and Performance of Manufacturing Companies in Nigeria

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## Abstract

Certain companies have accumulated substantial debt that surpasses their net gains, which has a negative impact on their performance and investor trust. Consequently, this can ultimately end in complete collapse and even lead to closures. Based on the above corporate challenges this study examines into the effect of debt financing on performance of manufacturing companies in Nigeria. The study employed the descriptive survey design. The secondary panel data was sourced audited financial statement of selected manufacturing firms in Nigeria from the period of 2019-2022. The panel regression technique was employed to determine the relationship and magnitude of impact between the dependent variables and independent variables. The Hausman test was employed in taking decision from the pooled effect, fixed effect and random effect model. The findings from objective one revealed that short term debt has negative significant effect on return on equity at ( $\beta$ :-0.23:  $p<0.05$ ) while long-term debt has positive significant effect on return on equity at ( $\beta$ : 0.10:  $p<0.05$ ). Objective two revealed that long-term debt and debt ratio has negative significant effect on earnings per share at ( $\beta$ :-1.57:  $p<0.05$ ) and ( $\beta$ :-42.73:  $p<0.05$ ). The study recommended that manufacturing companies should aim to reduce reliance on short-term debt, as it negatively impacts return on equity (ROE) due to higher interest rates and repayment pressures. Instead, companies should consider increasing long-term debt, which positively affects ROE by providing stable, lower-cost financing over extended periods. A balanced debt structure, with strategic use of long-term financing, can help firms enhance profitability while maintaining financial flexibility and managing risks effectively.

**Keywords:** Long-term debt; Short-term debt; Debt ratio; Return on asset and Earnings per share

## 1.1 Introduction

The capital structure is a crucial aspect of a firm's financing, and the finance manager is responsible for determining the optimal financing decision by considering the appropriate mix of debt and equity for the company. The capital structure decision refers to the combination of debt and equity that a company employs to fund its operations, which is essential for its effective functioning (Tuoyo et al., 2023; Puke, 2015). The topic of capital structure has been a significant concern in financial economics since Modigliani and Miller demonstrated in 1958 that, under certain assumptions such as frictionless markets and homogeneous expectations, a firm's capital structure decision is not important. Theories aim to determine the existence of an optimal capital structure and its possible drivers by examining the consequences of loosening assumptions. Extensive research has been conducted on the relationship between business value and these factors in recent decades (Obonyo, 2017).

Organisations seeking to obtain a competitive edge must ensure they have adequate funding to meet their requirements. However, obtaining additional finance beyond what is necessary could be detrimental, as it would not contribute to the productive foundation of an organisation but rather increase its financing expenses, resulting in a negative impact on its financial performance (Omaliko et al., 2020; Arumona et al., 2021). Organisations have two primary financing options: equity and debt. Debt is a significant element in the financial framework of corporations, serving as a means of acquiring finances for their commercial activities (Ajibola et al., 2018). Academics and researchers in corporate finance have been engaged in a

long-standing debate over identifying the best capital structure, despite the growing use of debt financing. This topic remains unresolved and difficult to define (Onyenwa & Glory, 2017). Several contemporary companies have not yet determined the ideal amount of debt that maximizes shareholder value. The significance of consumer products firms in the economy cannot be overstated. The Nigerian government at all levels has recognized and appreciated their contribution to employment creation and poverty reduction (Otunba, 2019).

Long-term debt, on the other hand, is an obligation that extends beyond one year, typically in the form of bonds. Debt capital refers to funds a business obtains by borrowing. A corporate loan, sometimes provided as growth capital, is typically repaid at a later date. Debt capital is distinct from equity or share capital, as those who provide debt capital do not acquire ownership in the business but act as creditors. Equity capital refers to invested money that, unlike debt capital, is not typically reimbursed to investors as part of regular corporate operations (Chukwuma et al., 2023). Financial leverage refers to the extent to which a company uses debt to finance its assets, rather than being a source of funding in itself. The purpose of a company's financial leverage is to generate higher returns on borrowed money than the associated costs. As the amount of debt increases, the level of financial leverage also rises. The main objective of a corporation in utilizing financial leverage is to amplify shareholders' returns under favorable economic conditions.

Debt financing plays a crucial role in increasing shareholder returns. This is based on the concept that funds received through fixed charges, such as loans from financial institutions or debentures, can be acquired at a cost lower than the firm's return on investment. Firm performance, as defined by Kale (2014), refers to the measurement of a firm's achievements and serves as an indicator of favorable conditions within a specific period. The primary goals of performance measurement are to gain valuable insights into cash flow, resource allocation, and the efficiency and efficacy of the organisation. Additionally, managers can make optimal decisions based on performance data (Almajali, Alamro & Al-Soub, 2012). The firm's survival and continuity frequently depend on its performance, particularly profitability, which can be enhanced through appropriate leveraging. The level of fund requirements, or leverage, varies among enterprises and is influenced by factors such as a firm's assets, structure, and system.

In recent years, manufacturing enterprises have progressively turned to debt finance to bolster their operations and expansion. According to CICMA statistics, debt levels in manufacturing enterprises have been consistently rising, with an average debt-to-equity ratio of 28%. The significant amount of debt raises concerns about its potential impact on these companies' financial performance. Manufacturing enterprises with substantial debt financing may face challenges, including greater interest expenses, decreased profitability, and elevated financial risk (Naomi, 2023). These issues can greatly impact the overall financial well-being and long-term viability of manufacturing enterprises.

However, strategic and tactical-level management advocates for using debt, viewing debt financing as beneficial to a company's performance if obtained at a favorable interest rate and used effectively. Nevertheless, some companies have not experienced this advantage, accumulating substantial debt that surpasses net gains, negatively impacting performance and investor trust. Consequently, this can ultimately lead to collapse or even closures. Several studies, including those by Arumona, Lambe, and Idogho (2022), Mamaro & Legotlo (2020), and Onyinyechi (2019), have consistently shown a correlation between debt financing and firms' financial performance. Debt overhang studies indicate that elevated debt levels might deter investments due to heightened expenses, leading to financial difficulties for companies' short- and long-term obligations. Based on these premises, this study examined the impact of debt financing on the performance of manufacturing companies in Nigeria, intending to investigate the period of debt financing on market-based and book-based performance measures in Nigeria's consumer goods sector.

## **2.1 Theoretical Review**

The pecking order idea was initially proposed by Donaldson (1961) and gained popularity through the work of Myers & Majluf (1984). According to the notion, management is advised to adhere to a specific order of preference while making finance decisions. The sequence is as follows: businesses have a preference for internal finance. Nevertheless, in cases where additional funding is necessary, companies priorities issuing the most secure financial instrument. Typically, they initiate with debt, followed by hybrid securities like convertible bonds, and finally resort to equity if necessary. Every company monitors its debt ratio, which indicates its overall need for external financing.

The pecking order theory is applicable to huge firms that are highly profitable and possess sufficient internal cash in the form of retained earnings and depreciation. Miglo (2010) argued that high-quality enterprises would want to utilize internal funds as a means of mitigating the adverse selection problem and minimizing value loss. Myers (1984) states that enterprises adhering to this theory aim to align their dividend payment ratios with their investment possibilities. However, the dividends remain relatively stable, and the intended payout ratios are only slowly altered in response to changes in the availability of profitable investment opportunities. Due to the uncertain nature of profitability and investment opportunities, as well as the consistent dividend policy, the internally generated cash flow may either exceed or fall short of the investment outlays. If the amount is lower, the company initially reduces its cash balance or marketable securities portfolio.

According to the pecking order theory, organizations that have high levels of growth and require significant funding are likely to have high levels of debt. This is due to the manager's hesitation to issue shares. The pecking order theory is related to the signaling theory, asymmetric information theory, and market timing theory, which all seek to explain the pecking order theory.

The analysis is based on the Agency theory developed by Jensen and Meckling in 1976. Agency theory seeks to explain the behavior of firms in the context of financing decisions. Their findings facilitated the establishment of a connection between the organization and the agency theory of corporate finance. Agency theory has significant implications for the relationship between equity holders and debt holders. Equity holders are primarily concerned with the excess return that surpasses the necessary debt repayment. Debt holders are solely concerned with the repayment of debt as outlined in the contractual agreement. Furthermore, it is observed that equity holders often have a tendency to engage in more risky business ventures, which may not align with the preferences of debt holders. In such cases, debt holders may demand higher prices for providing capital, as a means of exerting greater control and discouraging managers from investing in riskier projects. Agency Theory assumes that in a firm, there is a separation between ownership and management, leading to potential conflicts of interest between shareholders (principals) and managers (agents). The theory posits that managers may act in their own self-interest rather than in the best interest of shareholders, leading to agency problems. It assumes that shareholders seek to maximize their returns and that managers may have different goals, such as personal benefits or job security. To mitigate these conflicts, the theory suggests implementing monitoring mechanisms, such as performance-based compensation, audits, and governance structures, to align managers' interests with those of shareholders. The theory also assumes that information asymmetry exists, where managers have more information about the firm's operations and prospects than shareholders, which can further exacerbate agency problems. Effective incentive structures and monitoring are deemed essential to reduce these issues and ensure that management decisions enhance shareholder value.

The Trade-off theory was developed by David Myers and Michael Jensen in the 1980's. The trade-off hypothesis posits that a corporation determines the optimal mix of debt finance and equity finance by carefully weighing the associated costs and benefits. The trade-off hypothesis acknowledges the presence of bankruptcy costs. The statement highlights the benefit of using debt for financing, including the tax advantage, as well as the drawbacks of using debt, such as the costs associated with bankruptcy and financial difficulty. As debt increases, the additional benefit gained from further increases in debt decreases, but the additional expense increases. Therefore, a corporation that is maximizing its overall value will consider this trade-off when deciding how much debt and equity to utilize for financing. From an empirical standpoint, this theory can account for variations in debt-to-equity ratios across different businesses. However, it fails to elucidate the disparities inside a particular industry. The Trade-off Theory assumes that firms balance the benefits and costs of debt financing to determine their optimal capital structure. It posits that while debt can offer tax advantages through interest deductions, it also introduces financial distress costs, such as bankruptcy risks and agency costs. The theory assumes that companies weigh the tax shield benefits of debt against the potential costs of financial distress. Firms seek an optimal point where the marginal benefit of debt equals the marginal cost, achieving a balance that maximizes firm value. Additionally, the theory assumes that firms have access to debt markets and can adjust their capital structure based on changing economic conditions and business needs. The Trade-off Theory also presumes that firms are rational and aim to minimize the overall cost of capital while managing risks associated with excessive leverage, thereby optimizing their financial performance and stability.

## **Empirical Review**

Naomi (2023) investigates into the effects of debt financing on financial performance of manufacturing firms in Kenya. The theoretical framework includes pecking order theory, trade-off theory. The study examines the conditions associated with long-term debt financing, including the obligation to repay borrowed funds on predetermined dates. The study highlights the influential factors that may come into play, including but not limited to the interest rate charge on loans, duration, leverage level and interest coverage ratio. A comprehensive review of the empirical literature provides valuable insights into the relationship between debt financing and financial performance.

Sharma and Surbhi (2023) examines into the impact of debt financing on financial performance of firms. The efficacy of debt financing on financial performance of the organization and it's purely depends upon the findings of previous related literatures. For this purpose, Web of Science and SCOPUS database has been taken as base to collect the required information while it includes documents of all time spans available, from 1985 to 2022, in database. After gathering the data, a systematic literature review has been performed and encountered that debt indicators have a significant negative impact on indicators of financial performance. Long-term debt, total debt, debt-equity ratio has significant but negative impact on firm performance which support the upshots of 'pecking-order' theory. Short-term debt has mixed effect on performance indicators. Control variables have also been evaluated like age, size, tangibility, liquidity, corporate tax, growth opportunities etc. and discovered that size, growth and liquidity portray a positive impression while age and tangibility have negative efficacy on monetary performance of the concern. Also, the study can be used as a ground to identify the literature gap of the concept and can be used in future for further research.

Tuoyo Debo-Ajagunna, Efuntade, and Oladele (2023) conduct a study on the relationship between debt financing and performance, focusing on listed manufacturing enterprises in Nigeria from a behavioral perspective. The performance of enterprises was measured by debt financing, whereas the dependent variable was measured by ROA (return on assets). The study utilized a quantitative research design, obtaining data from the annual reports of five publicly traded manufacturing companies. The data spanned a period of six years, from 2016 to 2021. The study utilized panel least square regression and Analysis of Variance (ANOVA) to estimate the data and test the hypotheses. These methods were employed to validate the performance of the variables and demonstrate the influence of the explanatory variables. The findings indicate that the use of debt financing has a favorable and substantial impact on the performance of non-financial sector enterprises in Nigeria. The study suggests that the management of manufacturing firms listed in Nigeria should priorities the issue of capital structure. Specifically, they should pay close attention to short-term debt to address working capital deficits, and long-term loans for capital projects to avoid financial imbalances. Implementing this action would enhance the profit margin and lead to improved performance, ultimately maximizing wealth.

Danevska, Stanoevska, and Dimitrieska (2023) investigate the influence of debt financing on a company's value. The topic concerns enterprises based in North Macedonia. The study utilized a sample of 20 companies from North Macedonia that are included in the mandatory listing of the Macedonian Stock Exchange (MSE). The data collected covers a period of 6 years. The study use Panel Data models, namely Pooled OLS regression, Fixed Effects models, and Random Effects models, to evaluate the correlation between debt financing and the company's value, as measured by return on assets (ROA) and Tobin's Q. The findings indicate that short-term debt has a large and negative effect on the return on assets (ROA), while investments in human capital (HCROI), firm size, and current ratio have a positive and significant impact on the ROA. When examining the influence of indebtedness on a company's value, as assessed by Tobin's Q, both short-term and long-term debt exhibit positive and statistically significant impacts. Our analysis indicates that whereas debt enhances a company's market success metrics, it simultaneously diminishes the company's accounting operating performance. Hence, when evaluating the worth of a company, investors should take into account not only Tobin's Q, which is occasionally seen as a ratio of market value to book

value, but also examine basic ratios like ROA (return on assets), ROE (return on equity), and EPS (earnings per share).

Chukwuma, Nwankwo, Itumo, and Inyaeze (2023) conducted an investigation into the effects of debt financing on the financial performance of consumer goods companies listed in Nigeria. The study focused on assessing the impact of the debt-to-equity ratio on the return on assets (ROA) of these companies, as well as examining the influence of the total debt ratio and long-term debt ratio on their ROA. Secondary panel data, drawn from the annual reports and financial statements of these companies from 2011 to 2022, were utilized. The research adopted an ex post facto design, with data analysis performed using descriptive statistics and Ordinary Least Squares (OLS) regression. Hypotheses were tested through regression analysis at a 5% significance level. The results revealed that the debt-to-equity ratio had a negative but insignificant effect on the ROA of the listed consumer goods companies. Similarly, the total debt ratio was found to have an insignificant and negative relationship with ROA. The long-term debt ratio, though insignificant at the 5% level, showed a positive effect on ROA. Based on these findings, the study recommends that company management should exercise caution in relying on debt financing and instead prioritize funding activities through retained earnings, resorting to debt only as a last option, consistent with the pecking order theory. Additionally, for firms with substantial tangible assets, reliance on long-term debt financing is common, and policies that encourage the accumulation of such assets in expanding firms should be considered.

Hayati Liztiara & Muchtar (2022) investigated into effect of debt financing and firm performance of selected manufacturing companies. The sample used was 21 companies listed on the Indonesia Stock Exchange for the period 2016 - 2020. The sampling technique used was purposive sampling and the analytical method used was panel data regression. The results of this study state that the Short term debt ratio (STDA) has no effect on Return on Assets , Long term debt ratio (LTDA) has a negative and significant effect on Return on assets, Sales Growth (GROWTH) has a positive and significant effect on Return on assets, Short term debt ratio (STDA) has no effect on Net Profit Margin, Long term debt ratio (LTDA) has a negative and significant effect on Net Profit Margin , Sales Growth (GROWTH) has a positive and significant effect on Net Profit Margin.

Horsefall (2022) examined the correlation between debt financing and the profitability of consumer products manufacturing companies in Nigeria. The study examines the relationship between debt financing and profitability, which is assessed using financial indicators such as Return on Assets (ROA), Return on Capital Employed (ROCE), and gross profit margin. The study is based on two theories, namely the pecking order theory and the marketing timing theory. The study employed an ex-post facto research design. Regression and financial ratio are two often used strategies for data analysis. The study population consists of twenty (20) consumer goods manufacturing firms listed on the Nigeria Exchange Group. Out of them, a sample of 19 consumer goods manufacturing firms was selected using the Taro Yamane algorithm. The study discovered a substantial correlation between equity financing and profitability metrics (ROA, ROCE, and GPM). The study also discovered a notable correlation between debt financing and profitability metrics such as return on assets (ROA), return on capital employed (ROCE), and gross profit margin (GPM). However, equity/debt financing has a substantial correlation with return on assets (ROA) and gross profit margin (GPM), but it does not have a significant correlation with return on capital employed (ROCE). Nevertheless, the study suggests that the management of consumer goods firms listed in Nigeria should make concerted efforts to optimise the capital structure of their firms. This will lead to an improvement in profitability and raise the overall worth of the firm.

Nazir, Azam, and Khalid (2021) examine the correlation between the debt levels of listed companies and their performance on the Pakistan Stock Exchange (PSX) over a span of five years. The study utilized pooled ordinary least squares regression and fixed- and random-effects models to analyse a cross-sectional sample of 30 Pakistani companies operating in the automobile, cement, and sugar sectors from 2013 to 2017 (N = 150). The study found that both short- and long-term debt have adverse and substantial effects on firm performance in terms of profitability. These findings indicate that problems related to agency may result in the adoption of a high-debt strategy, which in turn leads to decreased performance. Nevertheless, the profitability of nonfinancial sector companies is positively influenced by both sales growth and firm size.

Arumona, Lambe, and Idogho (2021) conducted a study to examine the impact of debt financing on the financial performance of publicly listed consumer goods firms in Nigeria. The study's dependent variable

was financial performance, measured by the net profit margin (NPM), while the independent variable was short-term debt (STD). Two control variables, firm size and firm age, were also considered. Secondary data on financial performance and short-term debt were collected from the annual financial reports of 15 carefully selected consumer goods companies and the Nigerian Exchange Fact Book. The study utilized a panel data regression approach, enabling the selection between fixed and random effects through the Hausman test to assess the relationship between the variables. The findings indicated a negative and significant relationship between short-term debt and net profit margin. The study, therefore, recommended that management of listed firms should explore alternative performance metrics beyond debt financing to enhance overall performance.

Orji and Agubata (2021) investigate the impact of debt financing on the performance of firms in Nigeria. The study assessed debt financing by considering the variables of long term debt financing (LTDF), short term debt financing (STDF), and preferred stock financing (PSF). In contrast, the performance of firms was evaluated using Return on Equity (ROE). The investigation was guided by three hypotheses, and the parameter estimates were statistically tested using the OLS Regression Model. The study employed an Ex Post Facto research design, and data were collected from the NSE Factbook, Annual Reports, and Accounts. The study's findings indicate that Debt Financing has a substantial and favourable impact on Firms Performance in Nigeria, with statistical significance at a 5% level. The study's findings indicate that the utilisation of debt financing has resulted in enhanced performance of firms over the course of time. According to this, it was advised that companies should attempt to fund their investment activities through borrowing and only consider using either debt or equity as a final resort. Companies should consider using a high level of debt in their financing decisions, as it has a significant impact on their performance.

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Mamaro & Legotlo (2020) investigates the influence of debt financing on the financial performance of retail companies listed on the Johannesburg Stock Exchange (JSE). The existing literature presents conflicting findings regarding the funding structure of retail enterprises. The fixed effects were implemented by utilizing financial performance ratios. Return on equity was employed as the measure of profitability and served as the dependent variable. The independent variables included lagged return on equity, long term debt to total asset ratio, and total debt to total asset ratio. Additionally, size and sales growth were employed as control variables. The lagged return on equity, total debt to total asset, and growth in sales have a significant positive impact on the financial performance of return on equity at a 1% level of statistical significance. Conversely, long-term debt to total asset and firm size have a negative impact on financial performance, with statistical significance levels of 1% and 5% respectively. The study would assist retail managers in making financial decisions to optimize their asset utilization and enhance profitability. This study makes a valuable contribution to the existing body of knowledge and provides important insights for all parties involved in the retail industry to optimize their financing strategies for profitability. However, it is important to note that the findings of this study are specific to retail enterprises in South Africa and may not be applicable to other regions or industries.

Onyinyechi (2019) investigates the impact of debt financing on the financial performance of publicly traded companies in the Nigerian Stock Exchange. The dependent variables in this study are the return on assets and return on equity, while the covariate variables include the debt equity ratio, debt ratio, equity ratio, total liability ratio, and long term debt ratio. The multiple regression analysis reveals a robust correlation between return on assets and the explanatory variables. The return on equity has a positive correlation with the chosen explanatory variables. Consequently, effective utilisation of financial leverage results in improved, dependable, and equitable financial outcomes that accurately reflect the actual conditions in the food industry. Consequently, effective utilization of financial leverage results in improved, dependable, and

equitable financial outcomes that accurately reflect the actual condition of food and beverage enterprises in proportion. The study suggests that firm management should make significant efforts to optimize the capital structure in order to enhance returns on equity and assets. Additionally, it recommends that Nigerian firms should increase their investments in capital structure to improve earnings from business transactions.

Ajibola Wisdom & Qudus (2018) conducted a study on the influence of capital structure on the financial performance of publicly traded manufacturing companies in Nigeria from 2005 to 2014. The study utilized panel technique to examine the influence of capital structure on the financial performance of publicly traded industrial companies in Nigeria. The results from the panel ordinary least squares analysis indicate a statistically significant positive relationship between the long-term debt ratio (LTD) (0.0001) and the return on equity (ROE), as well as between the total debt ratio (TD) (0.0065) and the ROE. However, there is a statistically insignificant positive relationship between the ROE and the short-term debt ratio (STD). Furthermore, there was a weak and unimportant correlation seen between all the indicators of capital structure (long-term debt, short-term debt, and total debt) and return on assets (ROA), indicating that return on equity (ROE) is a more suitable metric for evaluating performance. The study found that capital structure has a favourable influence on financial performance, indicating that corporations should increase their utilization of long-term debts. It is therefore advised that every company should make prudent decisions regarding their capital structure in order to generate profits and ensure the successful continuation of their operation.

Udeh, Nwude, Itiri & Agbadua (2016) investigates the influence of debt structure on the performance of firms. The study utilized a dataset consisting of 12-year annualized panel data from 2001 to 2012. The dataset included information from 43 enterprises across several sectors. The data were gathered from the annual reports of the selected companies and Nigeria Stock Exchange fact books. The study utilized three regression estimations (Pooled OLS, Fixed Effects, and Random Effects) due to the presence of unobserved heterogeneity in the dataset. The regression calculations revealed that the debt structure of Nigerian quoted enterprises throughout the reviewed period had a significant and unfavorable impact on their performance. The study's findings indicate that the debt structure has a detrimental impact on the performance of Nigerian publicly traded companies, therefore supporting the pecking order theory.

**3.1 Methodology**

This research work utilized the descriptive research design, relying on secondary data that was employed obtained from the selected ten (10) quoted manufacturing companies on the Nigeria Stock Exchange Group. The quoted companies includes; Dangote Flour Mills Plc, Dangote Sugar Refinery Plc, Flour Mills Nigeria Plc, Honeywell Flour Mill Plc, Cadbury Nigeria Plc, Nestle Nigeria Plc, P.Z Cussons Nigeria Plc, Unilever Plc and Dangote Cement Plc. The dependent variables includes earning per share (market-based measure) and return on equity (book-based measure) while the independent variables are short-term debt, long-term debt and debt ratio. The model was adopted and adjusted to suit the present study includes; Chukwuma, et al., (2023), Horsefall (2022) and Naomi (2023).

**3.1.1 Model Specification**

Linear equation is given below;

$$PER_{t(EPs,ROE)} = f(DBF_t).....1$$

$$DBF_{i,t} = f(STD_{i,t},LTD_{i,t},DR_{i,t},FS_{i,t}).....2$$

**Model one**

$$ROE_{i,t} = f(STD, LTD, DR).....3$$

$$ROE_{i,t} = (\alpha_0 + \beta_1STD_{i,t} + \beta_2LTD_{i,t} + \beta_3DR_{i,t} + \mu_t).....4$$

**Model two**

$$EPS_{i,t} = f(STD, LTD, DR).....6$$

$$EPS_{i,t} = (\alpha_0 + \beta_1STD_{i,t} + \beta_2LTD_{i,t} + \beta_3DR_{i,t} + \mu_t).....7$$

Where:

PER= Performance at time t

DBF= Debt financing at time t

**Dependent Variables**

EPS= Earnings per share at time t

ROE= Return on equity at time t

**Independent Variables**

STD= Short term debt at time t

LTD= Long-term debt at time t

DR= Debt ratio at time t

U= Disturbance term/White noise at time t

i= nth term

$\alpha$  = Intercept

$\alpha_1- \alpha_6$  = Coefficient of the Independent Variables.

**3.1.2 Description of Variables**

Variables	Description	Measurement	Unit
<b>Performance measures</b>			
EPS	It is a financial metric that represents the portion of a company's profit allocated to each outstanding share of common stock	It is measured by Net Income minus dividend on preferred Stock and Weighted average Shares outstanding	Naira/percentage
ROE	It is a financial ratio that measures the profitability of a company in relation to shareholders' equity.	It is measured by Net Income divided by Shareholders Equity	Ratio
<b>Independent Variables</b>			
<b>Debt Financing Measures</b>			
STD	It refers to any financial obligations or liabilities that a company is required to pay off within a short period, typically within one year	It is measured by short-term debts divided by Assets	Naira
LTD	It refers to financial obligations or liabilities that a company is required to repay over a period longer than one year.	It is measured by long-term debt divided by Assets	Ratio
DR	It refers to the percentage of total debt to the asset in the capital structure of the organization.	It is measured by total debt divided by Assets.	Ratio

Author’s Compilation, 2024.

**4. Results and Discussion**

**4.1 Descriptive Analysis**

	EPS	ROE	STD	LTD	DR
<b>Mean</b>	11.13875	0.331455	0.633768	2.495989	0.459754
<b>Median</b>	1.035000	0.172796	0.530968	1.047555	0.493441
<b>Maximum</b>	63.92000	1.872808	3.435892	15.67890	0.751201
<b>Minimum</b>	0.130000	0.016899	0.248799	0.331202	0.061103
<b>Std. Dev.</b>	17.74471	0.477216	0.499160	3.680405	0.180242
<b>Skewness</b>	1.745403	2.125795	4.561836	2.498277	-0.708407
<b>Kurtosis</b>	4.885267	6.270644	26.18169	8.195783	2.761135
<b>Jarque-Bera Probability</b>	26.23327	47.95522	1034.387	86.60284	3.440693
	0.000002	0.000000	0.000000	0.000000	0.179004
<b>Sum</b>	445.5500	13.25822	25.35070	99.83956	18.39015
<b>Sum Sq. Dev.</b>	12280.12	8.881654	9.717263	528.2700	1.266997
<b>Observations</b>	40	40	40	40	40

Author Compilation, 2024

EPS (Earnings per share) has a mean value of 11.1% and median value of 1.03, ROE (Return on equity) has mean value of 0.33% and median value of 0.17%, STD (Short-term debt) has a mean value of 0.63% and median value of 0.53%. LTD (Long term debt) has a mean value of 2.49% and median value of 1.04%, DR (Debt ratio) has a mean value of 0.45% and median value of 0.49% and FS (Firm size) has a mean value 7.87% and median value of 8.09%. The minimum value and maximum value of EPS (Earnings per share) is 0.13 and 63.9. Minimum value and maximum value of ROE (Return on equity) is 0.01 and 1.87. Minimum value and maximum value of STD (Short-term debt) is 0.24 and 3.43. Minimum value and maximum value of LTD (Long-term debt) is 0.33 and 15.6. Minimum value and maximum value of DR (Debt ratio) is 0.06 and 0.75. Minimum value and maximum value of FS (Firm Size) is 5.37 and 9.41.

The Jarque-bera test is an asymptotic test which has EPS (Earnings per share) has a value of 26.233 at 0.000 probability which is not normally distributed. ROE (Return on equity) has a value of 47.9552 at 0.000 probability which is not normally distributed. STD (Short-term debt) has a value of 1034.3 at 0.000 probability which is not normally distributed. LTD (Long-term debt) has a value of 86.6028 at 0.000 probability which is not normally distributed. DR (Debt ratio) has a value of 3.4406 at 0.1790 probability which is normally distributed. FS (Firm size) has a value of 8.9532 at 0.011 probability which is normally distributed.

#### 4.2 Correlation Matrix

	EPS	ROE	STD	LTD	DR
EPS	1				
ROE	-0.2139	1			
STD	-0.2320	0.1696	1		
LTD	-0.2836	0.8607	0.4933	1	
DR	0.3959	-0.7482	-0.3641	-0.7943	1
FS	0.1772	0.2742	-0.1205	0.1384	-0.1640

#### Author Compilation, 2024

The table above shows that EPS (Earnings per share) has positive relationship with DR (Debt ratio) with 0.39 and FS (Firm Size) with 0.17 while negative relationship with STD (Short-term debt) at -0.23 and LTD (Long-term debt) at -0.28. ROE (Return on equity) has positive relationship with STD (Short-term debt) at 0.16, LTD (Long-term debt) at 0.86, FS (Firm Size) at 0.27, and DR (Debt ratio) at -0.74.

#### Regression Analysis

**Table 4.3: Dependent Variable: Return on Equity (ROE)**

Variable	Pooled	Fixed	Random
<b>C</b>	0.4219 (0.0183)	0.3142 (0.0237)	0.3344 (0.0205)
<b>STD</b>	-0.3168 (0.0001)*	-0.2316 (0.0001)*	-0.2388 (0.0000)*
<b>LTD</b>	0.1173 (0.0000)*	0.1041 (0.0000)*	0.1051 (0.0000)*
<b>DR</b>	-0.3972 (0.1872)	-0.2085 (0.4152)	-0.2481 (0.3000)
<b>R<sup>2</sup></b>	0.8350	0.9669	0.8919
<b>Adjusted R<sup>2</sup></b>	0.8213	0.9523	0.8829
<b>Durbin-Watson</b>	0.5823	2.0198	1.5719
<b>F-Statistics</b>	60.7537	65.9244	99.02159
<b>Prob (F-Statistics)</b>	0.0000	0.0000	0.0000
<b>Hausman Test</b>	0.4588		

Significant 1%\*; 5%\*\*; 10%\*\*\*

Author's Compilation, 2024

The Pooled regression model revealed that STD (Short-term debt) has a negative significant effect on ROE (Return on equity) which implies that a percentage increase in STD (Short-term debt) will lead to -0.316 decrease in ROE (Return on equity). LTD (Long-term debt) has a positive significant effect on ROE (Return on equity) which implies that a percentage increase in LTD (Long-term debt) will lead to 0.11 increase in ROE (Return on equity). DR (Debt ratio) has a negative insignificant effect on ROE (Return on equity)

which implies that a percentage increase in DR (Debt ratio) will lead to -0.39 decrease in ROE (Return on equity). The coefficient of determination using r-squared shows that the independent variables STD (Short-term debt), LTD (Long-term debt) and DR (Debt ratio) explained 83.50% variation in the selected manufacturing companies in Nigeria. Adjusted R-squared is 82.13% of other variables that was not included in the model.

The Fixed regression model revealed that STD (Short-term debt) has a negative significant effect on ROE (Return on equity) which implies that a percentage increase in STD (Short-term debt) will lead to -0.23 decrease in ROE (Return on equity). LTD (Long-term debt) has a positive significant effect on ROE (Return on equity) which implies that a percentage increase in LTD (Long-term debt) will lead to 0.10 increase in ROE (Return on equity). DR (Debt ratio) has a negative insignificant effect on ROE (Return on equity) which implies that a percentage increase in DR (Debt ratio) will lead to -0.20 decrease in ROE (Return on equity). The coefficient of determination using r-squared shows that the independent variables STD (Short-term debt), LTD (Long-term debt) and DR (Debt ratio) explained 96.69% variation in the selected manufacturing companies in Nigeria. Adjusted R-squared is 95.23% of other variables that was not included in the model.

The Random regression model revealed that STD (Short-term debt) has a negative significant effect on ROE (Return on equity) which implies that a percentage increase in STD (Short-term debt) will lead to -0.23 decrease in ROE (Return on equity). LTD (Long-term debt) has a positive significant effect on ROE (Return on equity) which implies that a percentage increase in LTD (Long-term debt) will lead to 0.10 increase in ROE (Return on equity). DR (Debt ratio) has a negative insignificant effect on ROE (Return on equity) which implies that a percentage increase in DR (Debt ratio) will lead to -0.24 decrease in ROE (Return on equity). The coefficient of determination using r-squared shows that the independent variables STD (Short-term debt), LTD (Long-term debt) and DR (Debt ratio) explained 89.19% variation in the selected manufacturing companies in Nigeria. Adjusted R-squared is 88.29% of other variables that was not included in the model.

Based on the test results, it can be inferred that the random effects in the model are correlated with the independent variables. This means that the random effect model is preferred over the fixed effect model ( $p > 0.05$ ). Therefore, the random effect model is used for drawing inferences for the objectives. The findings of the random effect model which is the inference model agree with the works of Puke (2015), Udeh, Nwude, Itiri & Agbadua (2016) and Ajibola Wisdom & Qudus (2018), the short-term debt in an organization would improve the performance level of manufacturing companies in Nigeria, the study disagrees with the works of Onyinyechi (2019).

**Table 4.4: Dependent Variable: Earnings per share (EPS)**

Variable	Pooled	Fixed	Random
<b>C</b>	-9.0582 (0.5279)	31.8177 (0.0246)	16.2521 (0.2081)
<b>STD</b>	-4.9468 (0.4301)	4.5605 (0.3829)	1.0165 (0.8345)
<b>LTD</b>	0.7741 (0.0019)	-1.5719 (0.0065)	-0.6405 (0.0211)**
<b>DR</b>	46.5462 (0.0464)	-42.7310 (0.0080)	-9.0456 (0.0211)**
<b>R<sup>2</sup></b>	0.8739	0.9669	0.8093
<b>Adjusted R<sup>2</sup></b>	0.8950	0.9523	0.8731
<b>Durbin-Watson</b>	0.9521	2.0198	1.6226
<b>F-Statistics</b>	2.5267	65.92441	0.1133
<b>Prob (F-Statistics)</b>	0.0727	0.0000	0.9517
<b>Hausman Test</b>		0.0406	

Significant 1%\*; 5%\*\*; 10%\*\*\*

Author's Compilation, 2024

The Pooled regression model revealed that STD (Short-term debt) has a negative insignificant effect on EPS (Earnings per share) which implies that a percentage increase in STD (Short-term debt) will lead to -0.316 decrease in EPS (Earnings per share). LTD (Long-term debt) has a positive significant effect on EPS

(Earnings per share) which implies that a percentage increase in LTD (Long-term debt) will lead to 0.77 increase in EPS (Earnings per share). DR (Debt ratio) has a positive significant effect on EPS (Earnings per share) which implies that a percentage increase in DR (Debt ratio) will lead to 46.5 increase in EPS (Earnings per share). The coefficient of determination using r-squared shows that the independent variables STD (Short-term debt), LTD (Long-term debt) and DR (Debt ratio) explained 87.39% variation in the selected manufacturing companies in Nigeria. Adjusted R-squared is 89.50% of other variables that was not included in the model.

The Fixed regression model revealed that STD (Short-term debt) has a positive insignificant effect on EPS (Earnings per share) which implies that a percentage increase in STD (Short-term debt) will lead to 4.56 increase in EPS (Earnings per share). LTD (Long-term debt) has a negative significant effect on EPS (Earnings per share) which implies that a percentage increase in LTD (Long-term debt) will lead to -1.57 decrease in EPS (Earnings per share). DR (Debt ratio) has a negative significant effect on EPS (Earnings per share) which implies that a percentage increase in DR (Debt ratio) will lead to -42.7 increase in EPS (Earnings per share). The coefficient of determination using r-squared shows that the independent variables STD (Short-term debt), LTD (Long-term debt) and DR (Debt ratio) explained 96.69% variation in the selected manufacturing companies in Nigeria. Adjusted R-squared is 95.23% of other variables that was not included in the model.

The Random effect regression model revealed that STD (Short-term debt) has a positive insignificant effect on EPS (Earnings per share) which implies that a percentage increase in STD (Short-term debt) will lead to 1.01 increase in EPS (Earnings per share). LTD (Long-term debt) has a negative significant effect on EPS (Earnings per share) which implies that a percentage increase in LTD (Long-term debt) will lead to -0.64 decrease in EPS (Earnings per share). DR (Debt ratio) has a negative significant effect on EPS (Earnings per share) which implies that a percentage increase in DR (Debt ratio) will lead to -9.04 decrease in EPS (Earnings per share). The coefficient of determination using r-squared shows that the independent variables STD (Short-term debt), LTD (Long-term debt) and DR (Debt ratio) explained 80.93% variation in the selected manufacturing companies in Nigeria. Adjusted R-squared is 87.31% of other variables that was not included in the model.

Based on the test results, it can be inferred that the fixed effects in the model are correlated with the independent variables. This means that the fixed effect model is preferred over the random effect model ( $p < 0.05$ ). Therefore, the fixed effect model is used for drawing inferences for the objectives. The findings agrees with the works of Horsefall (2022), Hayati Liztiara & Muchtar (2022) and Chukwuma, Nwankwo, Itumo, and Inyaeze (2023) but disagrees with the works of Danevska, Stanoevska, and Dimitrieska (2023).

### **5.1 Conclusion and Recommendations**

Model one depicts that short-term debt and long-term debt has negative and positive significant effect on return on equity. It implies that higher risks and costs in the short run. Conversely, long-term debt positively impacts ROE, suggesting that strategic, longer-term financing can enhance profitability. This highlights the importance of balancing debt structure to optimize corporate performance. Model two depicts that long-term debt and debt has negative significant effect on earnings per share. It implies that higher debt levels, especially long-term obligations, can dilute shareholder returns. Companies should carefully manage their debt levels to avoid adverse impacts on profitability and shareholder value. Based on the findings the manufacturing companies should aim to reduce reliance on short-term debt, as it negatively impacts return on equity (ROE) due to higher interest rates and repayment pressures. Instead, companies should consider increasing long-term debt, which positively affects ROE by providing stable, lower-cost financing over extended periods. A balanced debt structure, with strategic use of long-term financing, can help firms enhance profitability while maintaining financial flexibility and managing risks effectively. Manufacturing companies should prioritize reducing their debt levels, particularly long-term obligations. Excessive debt can strain profitability and reduce shareholder returns. Companies should focus on optimizing their capital structure by considering alternative financing methods, such as equity or retained earnings, to minimize debt burdens. Effective debt management and a balanced financing strategy will help protect shareholder value and improve profitability.

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