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EFFECT OF DEBT FINANCING ON EARNINGS PER SHARE OF LISTED MANUFACTURING FIRMS IN NIGERIA

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Abstract: This study investigates the impact of debt financing on earnings per share (EPS) among listed manufacturing firms in Nigeria. It employs total debt ratio, short-term debt ratio, and long-term debt ratio as proxies for measuring debt financing. Secondary data sourced from annual reports and accounts of 21 listed manufacturing forms from 2012 through 2022 were analysed using Panel Least Square (PLS) regression technique. The empirical findings reveal a significant positive relationship between total debt ratio and EPS, contrasting with an inverse relationship observed between short-term debt ratio, long-term debt ratio, and EPS. The study recommends that firms adopt strategies emphasizing low-cost operations to minimize borrowing, thereby reducing dependence on debt. Instead, leveraging retained earnings and exploring alternative low-cost financing options for investment purposes is encouraged.

Keywords: Debt financing, earnings per share, manufacturing firms, Nigeria
JEL: G32, G33, L60

1. Introduction

Debt financing is essential for businesses seeking external funds from sources such as bonds, banks, or financial institutions to sustain and expand their operations. This approach involves repaying borrowed funds along with accrued interest over a specified period (Tabd-Elnaby, 2019). For many enterprises, especially small to medium-sized enterprises (SMEs), relying solely on internal resources for adequate funding is often impractical, necessitating external financing options like bank loans or investments. This enables businesses to maintain operational continuity and pursue growth opportunities.

Financial leverage, facilitated by debt, incentivizes business owners to manage operations efficiently to meet financial obligations and enhance profitability. Moreover, interest payments on debt are typically tax-deductible, making debt financing an attractive option from a cost perspective (Fayed & Dubey, 2016). However, the decision to leverage debt entails inherent risks, as failure to meet repayment obligations could lead to severe consequences, including potential loss of assets pledged as collateral (Liljeblom & Maury, 2016).

Debt financing significantly influences financial metrics such as earnings per share (EPS), a critical indicator of a firm's profitability and performance. EPS reflects the portion of a company's profit allocated to each

outstanding share of common stock, serving as a key measure of shareholder value creation (Amahalu & Obi, 2020). The manufacturing sector, recognized as a cornerstone of economic development, contributes significantly to industrial output and employment generation, particularly in emerging markets like Nigeria.

Despite the benefits of debt financing, including enhanced liquidity and tax advantages, its strategic implementation remains a critical concern for firms aiming to optimize financial performance. The optimal balance between debt and equity, known as capital structure, influences both financial risk and shareholder returns. While extensive research has explored factors influencing capital structure decisions, empirical evidence on how specific debt ratios impact EPS remains inconclusive (Apima et al., 2016). Understanding these dynamics is crucial for firms in making informed decisions regarding their capital structure, ultimately aiming to maximize shareholder value through improved EPS performance.

The primary objective of this study is to investigate the effect of debt financing on earnings per share (EPS) of listed manufacturing firms in Nigeria. Specifically, the study aims to: evaluate the impact of total debt ratio, short-term debt ratio, and long-term debt ratio on EPS of listed manufacturing firms in Nigeria.

This paper is structured into five sections. The next section presents a review of literature, while the section three discusses the methodology. The results were provided and discussed in the fourth section, and the fifth section concludes the paper.

2. Literature Review

Conceptual Review

Debt Financing

Debt financing involves borrowing funds from external sources such as bonds, banks, or financial institutions to support business operations without relinquishing ownership of the company. This financial relationship obligates the borrower to repay the principal amount along with accrued interest within an agreed-upon period (Chen, 2020). Majaski (2020) notes that lenders, whether individuals or institutions, provide funds in exchange for a commitment to repay the debt on specified terms.

Total Debt Ratio

Total debt ratio is a financial metric that indicates the percentage of a company's assets financed through debt. It is calculated by dividing total debt by total assets, including current assets, fixed assets, and other assets (Sari, 2020). This ratio measures a firm’s leverage and its ability to cover liabilities with its assets. A higher ratio suggests higher financial risk due to increased reliance on borrowed funds (Wilkinson, 2020).

Short Term Debt Ratio

Short-term debt ratio, or current liabilities, refers to financial obligations expected to be settled within one year. It includes items such as commercial paper, overdrafts, and accrued expenses (Sisson, 2020). This ratio assesses a company's ability to meet its short-term financial obligations with available assets, indicating its liquidity and financial health (Ahern, 2020). It is measured by dividing total short term debt by total assets.

Long Term Debt Ratio

Long-term debt ratio measures the proportion of a company’s assets financed by loans with repayment periods exceeding one year, typically more than five years. This ratio is calculated by dividing long-term debt by total assets and provides insight into a company’s long-term solvency and leverage (Harvey, 2020). Higher ratios indicate greater reliance on long-term debt, impacting the firm’s financial flexibility and risk profile (Campbell, 2020).

Earnings Per Share (EPS)

Earnings per share (EPS) is a key financial metric that indicates the portion of a company's profit allocated to each outstanding share of common stock. It is calculated by dividing net income after taxes by the total number

of outstanding shares (Folger, 2020). EPS is a crucial indicator of a company's profitability and is widely used by investors and analysts to evaluate its financial performance and potential stock value.

Theoretical Review

Trade-Off Theory

The trade-off theory of capital structure posits that firms determine their optimal mix of debt and equity financing by weighing the costs and benefits associated with each source. Originating from the work of Kraus and Litzenberger (1973), this theory suggests that companies balance the tax advantages of debt against the financial distress costs, including potential bankruptcy costs and agency costs (Voutsinas & Werner, 2011). The theory asserts that as firms increase their debt levels, they benefit from tax shields on interest payments, but also incur increasing costs due to higher financial distress risks. Therefore, there exists an optimal capital structure where the marginal benefit of debt financing equals the marginal cost of financial distress (Kraus & Litzenberger, 1973).

The core objective of the trade-off theory is to explain why firms typically finance their operations through a combination of debt and equity rather than relying solely on one source of funding. By optimizing their capital structure, firms aim to maximize their overall value by leveraging the tax advantages of debt while managing the risks of financial distress (Kraus & Litzenberger, 1973).

Empirical Review

Orji, Nwadialor, and Agubata (2021) investigated the impact of debt financing on firm performance in Nigeria. Using data from the Nigerian Stock Exchange Factbook and annual reports, they found significant positive effects of long-term and short-term debt financing on return on equity (ROE) for firms in Nigeria. Kuˇcera, Vochozka, and Rowland (2021) determined the optimal credit absorption capacity of enterprises in Austria from 2012 to 2018. Their study indicated a negative relationship between leverage and enterprise performance using data from the Albertina database. Yulianto, Witiastuti, and Widiyanto (2021) examined the impact of debt and equity on firm performance in the context of technology information digitalization (TID) in Indonesia from 2008 to 2019. They found that companies with asymmetric information preferred debt over equity and that debt positively influenced the utilization of growth opportunities.

Eke and Memeh (2022) carried out a study to determine the relationship between capital structure and financial performance of firms in Nigeria. The study adopted ex-facto research design while the population of the study consists of twelve (12) firms listed in the industrial goods and services sector on the Nigeria Stock Exchange group as at 2021. The study utilises secondary data sourced from annual report of the sampled firms. The method of data analysis that was employed in this study was descriptive statistics, correlation analysis and ordinary least square regression. From the regression results of the study, it was found that total debt and short term debt were found to have a positive impact on financial performance. This implies that debt component of the capital structure, has effect on the financial performance of the firm. While the long term debt ratio was found to have a negative impact on financial performance, equity financing, has a positive effect on financial performance. Therefore, the study recommends that the firm should concentrate on short term debt and equity financing in their operations, which in turn will enhance their financial performance.

Aguguom and Ajayi (2020) investigated the effects of accounting quality on shareholder wealth maximization among Nigerian listed companies from 2010 to 2019. They employed panel data regression and found significant positive effects of accounting quality on economic value added (EVA) and earnings per share (EPS). Panova (2020) studied the capital structure determinants and financial decisions of Russian SMEs in the

manufacturing sector from 2010 to 2018. The study highlighted that current liquidity and asset structure negatively influence financial leverage in Russian SMEs. Ogbonna and Chukwu (2020) analysed the relationship between market value of firms and capital structure in Nigeria from 2010 to 2017. They employed panel generalized method of moments and found positive impacts of both equity and debt on market value of firms.

Agung and Andi (2019) examined the influence of financial variables on share return in the Indonesian real estate sector from 2009 to 2016. Their study revealed positive effects of debt to equity ratio (DER) and earnings per share (EPS) on share return, while return on assets (ROA) and company size showed negative effects. Sanjay (2019) explored the effects of corporate capital structure on cost of capital and market value in the Indian cement industry from 2011 to 2018. The study did not find a significant linear relationship between financial leverage and cost of capital or total valuation in the Indian cement industry. Ahfer (2019) investigated the impact of financial leverage on shareholder wealth among Sri Lankan listed companies from 2012 to 2017. The study did not establish a clear relationship between financial leverage and shareholders' wealth. Bannerman and Fu (2019) examined the effects of long-term debt on firm growth in China from 2013 to 2018. They found that long-term debt had a negative impact on firm growth, though not statistically significant.

Ahmed, Awais, and Kashif (2018) analyzed the optimal capital structure for firms in Pakistan using data from the Karachi Stock Exchange 100 index from 2005 to 2014. Their findings highlighted significant impacts of financial leverage, interest cover, and sales growth on firm profitability. Nenu, Vintila, and Gherghina (2018) examined the relationship between capital structure, risk, and firm performance in the Romanian market from 2000 to 2016. Their study found positive correlations between leverage, firm size, and share price volatility. Venugopal, Sharma, and Ravindar (2018) analysed the impact of capital structure on shareholder value in Indian pharmaceutical firms from 2007 to 2015. Their study revealed positive correlations between debt equity ratio and long-term debt ratio with created shareholder value (CSV), while total debt ratio showed a negative correlation

Rufus and Ofoegbu (2017) examined the impact of capital structure on financial performance among Nigerian construction and real estate companies from 2005 to 2014. They found positive impacts of capital structure on earnings per share (EPS) and return on capital employed (ROCE). Oseifuah and Gyekye (2017) investigated the relationship between working capital management efficiency and firm value among South African firms listed on the Johannesburg Stock Exchange from 2003 to 2012. They found significant positive relationships between firm value and inventory conversion period and receivables conversion period.

Githrie and Muluri (2015) appraised the effect of financial structure on firm performance among firms listed on the Nairobi Securities Exchange from 2008 to 2013. They found positive effects of equity and long-term debt on financial performance, while short-term debt had a negative impact.

Gaps in Literature

Given the challenges of accessing traditional debt financing in Nigeria there is a gap in research exploring effect of debt financing on manufacturing firms in Nigeria. There is a need therefore for more nuanced studies that delve into the unique characteristics and challenges of listed manufacturing firms in Nigeria. Specifically, how debt financing strategies impact earnings per share of listed manufacturing firms in Nigeria.

3. Methodology

The research design employed in this study is the *ex-post facto* research design. An *Ex-post Facto* research determines the cause-effect relationship among variables. *Ex-post Facto* seeks to find out the factors that are

associated with certain occurrence, conditions, or behaviours by analysing past events or already existing data for possible casual factors (Kothari & Garg 2014). The population of this study comprised all the fifty-nine (59) listed manufacturing companies in Nigeria as at 31st December 2022 (Nigerian Exchange Group, 2022). Purposive sampling technique was adopted in the determination of the sample size based of the availability and up-to-date annual financial statements; listed manufacturing companies that have consistently submitted their annual reports to the Nigerian Exchange Group (NGX) from 2012 to 2022. In view of this, twenty-one (21) listed manufacturing companies served as the sample size of this study. Essentially, this study utilised secondary panel data extracted from the annual reports and statements of account of the sample listed manufacturing companies

Model Specification

This study adapts the model of Agung and Andi (2019) given below as

$$ROE = \beta o + \beta_1 DER + \beta_2 TLR + \beta_3 CDR + \xi \quad 1$$

Where: ROE is return on equity, DER is debt-to-equity ratio, TLR is total liability ratio

CDR is cash flow to debt ratio, and ξ is error term

Hence, to investigate the effect of debt financing on earnings per share of listed manufacturing firms in Nigeria, below is the model specification

$$EPS_{it} = \beta o_{it} + \beta_1 DR_{it} + \beta_2 STDR_{it} + \beta_3 LTDR_{it} + \beta_4 LQTY_{it} + \mu_{it} \quad 2$$

Where:

EPS_{it} = Earnings per Share of firm í in period t

DR_{it} = Debt Ratio of firm í in period t

$STDR_{it}$ = Short Term Debt Ratio of firm í in period t

$LTDR_{it}$ = Long Term Debt Ratio of firm í in period t

$LQTY_{it}$ = Liquidity of firm í in period t

μ_{it} =idiosyncratic error (unobservable factors) that vary over time and affect EPS

í = individual firms (1,2, 3,… 21)

t= time periods (1,2, 3,… 11)

$\beta_0, \beta_1, \beta_2, \beta_3,$ = Regression coefficients

Apriori, we expect $\beta_1<0$; $\beta_2<0$; $\beta_3>0$; $\beta_4>0$

Data Analysis

Financial data sourced from the Nigerian Exchange (NGX) Group publications and annual reports of listed manufacturing firms in Nigeria spanning 2012-2022 was analysed. The study utilized a balanced panel dataset comprising 231 firm-year observations across 21 firms over an eleven-year period. Descriptive statistics including mean, median, standard deviation, skewness, kurtosis, maximum, and minimum values were calculated to summarize the variables. Inferential statistical analysis was conducted, employing the Panel Least Square (PLS) Regression technique used for predictive analysis based on inter-variable relationships.

PLS regression can account for individual-specific effects that are constant over time but vary across individuals. This is important in panel data where individual units (e.g., people, firms, countries) have unique characteristics that may affect the outcome being studied. It can also accommodate time-specific effects that

affect all individuals uniformly across time periods. PLS regression is useful for evaluating the impact of policies or interventions over time, where both temporal and cross-sectional variations are important.

Table 1: Measurement and Operationalisation of Variables

Variables	Acronym	Measurement	Authors	Apriorism Sign
Independent Variable (Debt Financing)				
Total Debt Ratio	TDR	Total Debt/Total Assets	Eze and Akwarandu (2020)	Negative
Short Term Debt Ratio	STDR	Short Term Debt/Total Assets	Ahern (2020)	Negative
Long Term Debt Ratio	LTDR	Long Term Debt/Total Assets	Matar and Eneizan (2018)	Positive
Dependent Variable (Earnings Per Share)				
Earnings per Share	EPS	$\frac{\text{Net Income after Tax}}{\text{Number of Outstanding Shares}}$	Naz, Ijaz and Naqvi (2016)	Positive

Source: Authors' compilation.

4. Results and Discussions

Table 2: Descriptive Statistics of Variables

Statistic	EPS	DR	STDR	LTDR	LQTY
Mean	1.0362	11.0185	6.1738	10.2069	0.6254
Median	1.01	11.16	5.94	10.13	0.61
Maximum	1.41	12.11	6.93	11.24	0.89
Minimum	0.55	9.88	5.25	9.08	0.33
Std. Dev.	0.2659	0.836	0.5332	0.715	0.1879
Skewness	0.248	-0.1624	-0.0654	0.069	0.302
Kurtosis	2.0801	1.4424	1.6654	1.6344	1.9319
Jarque-Bera	9.5916	1.3713	7.974	1.0205	0.8156
Probability	0.0089	0.5038	0.0145	0.6004	0.6651

Source: Authors' computation

The descriptive statistics provided in Table 1 offer a comprehensive view of five key variables—EPS (Earnings Per Share), DR (Debt Ratio), STDR (Short-Term Debt Ratio), LTDR (Long-Term Debt Ratio), and LQTY (Liquidity Ratio). EPS mean value of 1.0362 indicates the average earnings per share, while its standard deviation of 0.2659 suggests moderate variability around this average. EPS exhibits a slight positive skewness (0.248), implying a distribution where higher earnings per share values are slightly more frequent than lower values. The significant Jarque-Bera statistic (9.5916, $p = 0.0089$) indicates that EPS deviates significantly from a normal distribution, which may be crucial to consider in further analyses.

The mean debt ratio (DR) of 11.0185 and its standard deviation of 0.836 highlight considerable variability in debt ratios across observations. DR shows a slight negative skewness (-0.1624), suggesting a tail towards lower debt ratios. The Jarque-Bera test result (1.3713, $p = 0.5038$) indicates that the distribution of DR does not significantly depart from normality, suggesting its distribution can be approximated by a normal curve reasonably well. STDR, with a mean of 6.1738 and a standard deviation of 0.5332, exhibits a distribution with

moderate variability. It shows a very slight negative skewness (-0.0654) and a significant departure from normality based on the Jarque-Bera test (7.9740, p = 0.0145). This suggests a non-normal distribution for short-term debt ratios within the dataset. LTDR, characterized by a mean of 10.2069 and a standard deviation of 0.715, appears to have a distribution that closely approximates normality, supported by its skewness (0.069) and the non-significant Jarque-Bera statistic (1.0205, p = 0.6004). Similarly, LQTY, with a mean of 0.6254 and a standard deviation of 0.1879, shows slight positive skewness (0.302) and no significant departure from normality according to its Jarque-Bera test (0.8156, p = 0.6651).

Table 3: PLS Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.15769	0.41674	17.1755	0
DR	0.25652	0.04064	6.31241	0
STDR	-0.0365	0.01357	-2.6941	0.0076
LTDR	-0.4922	0.05222	-9.4251	0
LQTY	0.42793	0.13645	3.13626	0.0019
R-squared	0.03612	F-statistic	57.1364	DW 1.9269
Adjusted R-squared	0.00586	Prob(F-statistic)	0	

Source: Authors' computation.

The regression analysis result (Table 3) reveal important insights into the relationship between the dependent variable (EPS) and the independent variables (DR, STDR, LTDR, LQTY) in the model. Each coefficient provides specific information: DR (Debt Ratio) shows a positive impact on the EPS, indicating that higher debt ratios are associated with higher values of the EPS. Conversely, STDR (Short-Term Debt Ratio) and LTDR (Long-Term Debt Ratio) exhibit negative impacts, suggesting that increases in these ratios correspond to decreases in the EPS. LQTY (Liquidity Ratio) demonstrates a positive influence, indicating that higher liquidity ratios are associated with higher values of the EPS. All coefficients are statistically significant with p-values of 0, indicating robust relationships.

The model's overall fit is reflected in the R-squared and adjusted R-squared values, which are relatively low at 0.03612 and 0.00586, respectively. This suggests that only a small proportion of the variance in the EPS is explained by the independent variables included in the model. Despite this, the significant F-statistic (57.1364, p = 0) indicates that the model as a whole is statistically significant and useful for predicting the dependent variable. However, the Durbin-Watson statistic (1.9269) suggests no positive autocorrelation in the residuals of the model.

The regression analysis results from Table 3 provide valuable insights into the relationship between the dependent variable, EPS (Earnings Per Share), and the independent variables—DR (Debt Ratio), STDR (Short-Term Debt Ratio), LTDR (Long-Term Debt Ratio), and LQTY (Liquidity Ratio). Each coefficient in the model offers specific information about how these financial metrics impact EPS. DR shows a positive coefficient, suggesting that firms with higher debt ratios tend to have higher EPS. This could imply that leveraging through debt positively affects profitability, possibly through increased financial leverage or tax advantages associated with debt financing.

Conversely, STDR and LTDR exhibit negative coefficients, indicating that higher short-term and long-term debt ratios are associated with lower EPS. This negative relationship suggests that too much reliance on debt, especially in the short and long term, may strain profitability, possibly due to higher interest expenses or financial risk. On the other hand, LQTY shows a positive coefficient, indicating that firms with higher liquidity ratios tend to have higher EPS. This aligns with the conventional wisdom that adequate liquidity buffers enable firms to manage operational challenges and invest in growth opportunities more effectively.

5. Conclusion and Recommendations

This study illuminates the critical impact of financial metrics—debt ratios (DR, STDR, LTDR) and liquidity ratio (LQTY)—on EPS (Earnings Per Share) among 21 firms over an 11-year period. It reveals that while higher debt ratios can initially boost EPS, excessive reliance on short-term and long-term debt may hamper profitability. Conversely, maintaining higher liquidity ratios tends to correlate positively with EPS, indicating benefits in managing cash flows and operational flexibility. These findings underscore the importance of balanced financial strategies that optimize debt levels while ensuring sufficient liquidity to support growth and mitigate risk.

Based on the insights gained from the regression analysis, firms should carefully manage their debt levels, balancing the benefits of leveraging with the risks of increased financial strain. It is crucial to monitor and adjust short-term and long-term debt ratios to avoid over-reliance, ensuring financial stability and sustainable profitability. Additionally, maintaining adequate liquidity through effective cash flow management and prudent working capital policies is essential, as higher liquidity ratios are associated with higher EPS. Continuous monitoring of these financial metrics, coupled with integrated risk management practices, will enable firms to navigate economic fluctuations and capitalize on growth opportunities while maintaining resilience in competitive markets.

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