Effect of Capital Structure on the Performance of Deposit Money Banks in Nigeria

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Abstract
This article evaluates the influence of capital structure on the performance of banks in Nigeria. The goals were to explore the effect of long-term debt ratio, short-term debt ratio, and debt-to-equity ratio on the return on assets of banks in Nigeria. Secondary data were gathered from the audited financial statements of 13 listed banks on the Nigerian Exchange Group. The information collected covers from 2017 to 2023. The data were assessed using the multiple regression technique, which was additionally used in testing the null hypotheses of the study. The findings indicate that the long-term debt ratio (LTDR) shows an insignificant positive impact on return on assets (ROA). In contrast, short-term debt-to-ratio (STDR) and debt-to-equity ratio (DER) have a notable effect on the return on assets (ROA) of listed banks in Nigeria. The research thus concludes that capital structure significantly affects the corporate performance of listed banks in Nigeria. The study suggests that banks should utilize long-term debt cautiously in their capital structure, as excessive debt can negatively influence value. Each firm needs to identify its optimal debt-equity ratio to maximize value. Moreover, banks should improve their debt-to-equity ratio to attract more investors and boost share prices and overall value.

Keywords: *Capital Structure, deposit money banks, debt-to-equity ratio, long-term debt ratio, returns on assets.*

INTRODUCTION

Capital structure which is a mix of debt and owners is a critical decision for every focused finance managers. Capital structure also known as the proportionate debt to equity of a firm (Pandey, 2010). This decision significantly affects shareholder returns and risks, this is because capital structure is assume to have a significant effect on the market value of shares. Pandey (2010), also avow that financial managers must address key questions regarding investment financing, the implications of financing choices, the impact of these key factors to shareholders, and whether an optimal financing mix exists.

The notable work on the theory of capital structure by Modigliani and Miller (1958) has stimulated extensive empirical and theoretical studies (Jensen & Meckling, 1976; Myers & Majluf, 1984). Researchers suggest that firms strategically determine their optimum capital mix for debt and equity such that a balance between costs and benefits is met (Brander & Lewis, 1986; Harris & Raviv, 1990). However, some firms lack formal capital structure planning, allowing their financing

strategies to evolve reactively from managerial decisions. Such firms may face challenges in funding future operations and optimizing capital use.

Capital mix is closely tied to the value of the firm for which the optimum decision is geared towards the minimization of the cost of capital and maximization of market value (Paramasivan & Subramanian, 2008; Ganiyu, 2015). Poor capital structure decisions can lead to elevated costs and financial risks, ultimately threatening corporate viability (Njeri & Kagiri, 2013). Myers (1984) emphasizes that capital structure at its optimum is very crucial for banks, offering a buffer against unexpected losses (Nyor & Yunusa, 2016).

The corporate landscape, particularly since the financial liberalization through the Structural Adjustment Program in 1987, presents challenges including high interest rates and economic instability (Ozkan, 2016; Oladeji & Olokoye, 2014). As borrowing costs have risen, the Nigerian economy has struggled to remain competitive, leading to unfavorable trade balances and inflation (Patrick, Joseph & Kemi, 2013).

The complex association that exit between capital structure and the performance of the firm remains an area for continued research. This makes it imperative to further interrogate their interactions capital mix in relation to deposit money banks in Nigeria.

Statement of the Problem

The issue of capital structure as it relate to the banking sector is distinct in relation to other industries this is because of its distinct role in the financial system (Omosele, 2021). While the consolidation of banks has improved capitalization, its effects on Deposit Money Banks performance (DMBs) remain ambiguous (Hassan & Miko, 2016). Mixed results from empirical studies on the capital structure-performance relationship add complexity to this issue. For example, Abor (2007) identified a positive correlation in Ghanaian firms, which is supported by other studies (Masulis, 1983; Jordan et al., 1998; Simerly & Li, 2000; Frank & Goyal, 2003; Deping et al., 2011). In contrast, Chakraborty (2010) found a negative relationship using performance ratios and leverage measures.

Studies suggest that the mixture of equity and debt in a company's financial structure strongly influences their financial activities. (Tian & Zeitun, 2007; Champion, 1999; Gosh et al., 2000; Hadlock & James, 2002; Abor, 2005; San & Heng, 2011; Chakraborty, 2010). Although low levels of debt can improve earnings after tax, excessive leverage raises overall costs, adversely affecting performance. Post-consolidation, Nigerian banks witnessed a rise in equity capital relative to debt, particularly following the Central Bank of Nigeria's bailouts.

Given these dynamics, this study aims to explore how variations in capital structure have influenced the performance of quoted banks in Nigeria.

Objectives of the Study

The specific aims of this study are:

1. To determine the effect of long-term debt ratio (LTDR) on the return on assets of deposit money banks (DMBs) in Nigeria.
2. To examine the impact of short-term debt-to-ratio (STDR) on the return on assets of deposit money banks (DMBs) in Nigeria.
3. To ascertain the effect of debt-to-equity ratio (DER) on the return on assets of deposit money banks (DMBs) in Nigeria.

Literature Review

Imoter and Dugugh (2018) scrutinized the effect of capital structure on the financial standing of specific deposit money banks operating within Nigeria. They utilized data gleaned from the institutions' financial reports spanning the years 2013 to 2017. For their analytical framework, the researchers applied fixed-effect regression, chosen over random effects due to the conclusive results from the Hausman test.

The research uncovered that the equity-to-total assets ratio (EQR), the debt-to-total assets ratio (DTR), and the debt-to-equity ratio (DER) displayed an inverse relationship with the Return on Assets (ROA). Furthermore, the study indicated that both the EQR and DER demonstrated a positive correlation with the Return on Equity (ROE).while DTR had a negative effect. Additionally, all three ratios positively influenced Earnings Per Share (EPS) in one model, but in another analysis, EQR and DTR negatively affected EPS, whereas DER improved the Quick Ratio. Bala and Babangida (2022) investigated the relationship between a firm's capital structure and its financial health within Nigerian Deposit Money Banks (DMBs). Their analysis focused on a selection of entities. The study drew upon a set of six DMBs that were publicly traded on the Nigerian Stock Exchange (NSE), considering data up to December 2020. The selection process utilized a combination of stratified and purposive sampling methods. The researchers gauged financial performance via net interest margin; this served as the dependent variable (DV). Capital structure was operationalized through the Short-Term Debt Ratio (STDTA) and the Long-Term Debt Ratio (LTDTA), which acted as the independent variables. Panel regression was employed to examine the dataset. Findings revealed, at a 5% level of significance, that the p-values highlighted a substantial effect of short-term debt (STDTA) on return on assets (ROA), with a p-value of 0.94, along with total debt-to-asset ratio (TDTA) displaying a significant impact on ROA, showing a p-value of 0.31. In contrast, long-term debt (LTDTA) demonstrated a modest influence on ROA, reaching a 9% level of significance.

Adeyemi and Adedeji's study (2020) investigated how capital structure influenced the financial success of commercial banks listed on the Nigerian Stock Exchange (NSE) from 2006 to 2019. The investigation used panel data, drawing from the yearly reports and financial disclosures of select Deposit Money Banks (DMBs) trading on the NSE. Both descriptive and inferential statistics were used to assess the link between Return on Assets (ROA), equity capital, and leverage ratios, all the while accounting for asset tangibility and liquidity.

The results, derived from the system dynamic panel Generalized Method of Moments (GMM) estimator alongside the non-causality model, revealed that equity capital had a considerable positive impact on ROA, conversely, leverage showed a detrimental effect. Furthermore, the study discovered a reverse causal connection, implying that ROA also plays a role in shaping capital structure.

In their 2018 work, Ahmed and his colleagues explored how a company's debt-to-assets ratio and equity-to-assets ratio influence both return on equity (ROE) and net interest margin (NIM). Their study's foundation was based on all 21 DMBs operating within Nigeria, as licensed by the Central Bank of Nigeria (CBN) in 2017. A more focused selection was achieved by using convenience sampling to analyze 12 of those banks, covering the years 2007 to 2016. Random effects estimation within a panel design was the statistical method of choice. The result demonstrated a beneficial association between financial success, gauged by NIM, and the company's financial makeup.

The research strongly promotes better incentive systems for individuals that provide short-term deposits (STDs). This suggestion is designed to more effectively direct the maturity timeline of STDs. They add, as a follow-up recommendation, the careful deployment of debt to capitalize on its tax advantages while at the same time maximizing administrative efficiency.

Erhomosele (2021) explored the connection between how Nigerian deposit money banks (DMBs) structured their capital and the industry's performance trajectory. The study employed leverage to represent capital structure, using profit efficiency and return on equity to gauge how well the banks performed. The influence of capital structure on performance was examined through a regression analysis. This analysis utilized consistent panel data, drawn from 11 selected DMBs. The study revealed a relationship that wasn't directly proportional: the link between capital structure and DMBs' performance was non-linear.

METHODOLOGY

Research Design

The research design employed for this study is the ex post facto research design. Agburu (2001) defines it as investigating how past variables influence current occurrences. This design is suitable when controlling or manipulating independent variables is impractical, costly, or ethically questionable (Akpa & Angahar, 1999). Furthermore, the procedure is justified because the primary data, specifically the audited financial statements of banks, are already compiled and available.

Sample and Sampling Technique

The research employed a purposive sampling approach. This particular non-probability method was selected because, as of December 2023, a mere 13 out of 26 licensed commercial banks were publicly traded on the Nigerian Stock Exchange (NSE).

Considering the banks' status on the exchange, the study deliberately selected the 13 listed commercial banks operating within the Nigerian Exchange Group as of December 2023. These included: Access Bank, Eco Bank, First City Monument Bank, Fidelity Bank, First Bank, Guaranty Trust Bank, Sterling Bank, Zenith Bank, United Bank for Africa, Union Bank, Unity Bank, Wema Bank, and Stanbic IBTC Bank.

Sources of Data

Secondary data was sourced from the audited annual published financial statements of the 13 banks selected for the study from 2017 to 2023.

Definition and Measurement of Variables

Dependent Variable

The dependent variable in this study is the return on assets (ROA) of DMBs, a widely used indicator of firm performance in capital structure research (Derayat, 2012; Singh, 2013). ROA is advantageous because it considers total assets; both debt and equity, allowing for a more comprehensive profitability measure compared to return on equity (ROE), especially for highly leveraged companies (Fosu, 2013). ROA is calculated as net income divided by total assets, and using net income is essential as it reflects the tax benefits of debt.

$$ROA = \frac{Net\ income}{Total\ assets}$$

Independent Variables

These variables include long-term debt ratio (LTDR), short-term debt ratio (STDR), and debt-to-equity ratio (DER). They are further defined below.

Long-Term Debt Ratio (LTDR)

This metric represents the proportion of a firm's assets that is financed through long-term loans and liabilities. It provides insight into the company's financial health and its capability to fulfill its loan obligations.

$$\text{LTDR} = \frac{\text{Long Term Debt}}{\text{Total Assets}}$$

Short-Term Debt Ratio (STDR)

This metric reflects the proportion of a firm's assets that are funded through short-term borrowings and financial commitments. It serves as an evaluation of the company's financial health and its capacity to settle its short-term debts. The calculation involves dividing the value of short-term liabilities by the total value of the assets.

$$\text{STDR} = \frac{\text{Short Term Debt}}{\text{Total Assets}}$$

Debt-Equity Ratio (DER)

This ratio measures a firm's indebtedness relative to its equity, calculated as total debt divided by shareholders' equity.

$$\text{DER} = \frac{\text{Total Debt}}{\text{Shareholder's Equity}}$$

Model Specification

The econometric model of the study is specified as;

$ROA_{it} = \beta_0 + \beta_1 STDR_{it} + \beta_2 LTDR_{it} + \beta_{3i} DER_{it} + ui_{it}$ (1)

ROA = Return on Asset
STDR = Short-term debt ratio
LTDR = Long-term debt ratio
DER = Debt-Equity ratio
Ui = error item

β1 – β3 represents the coefficients of the independent variables, indicating their contribution to the dependent variables.

Techniques of Data Analysis

This research employed descriptive statistics to gain insight into the data's properties. This involved calculating summary measures such as the averages, the degree of value spread (standard deviations), and the difference between the highest and lowest values (range). Furthermore, the model's parameters were determined by utilizing multiple regression analysis. This analytical approach facilitated an assessment of the relationships between capital structure and the financial health of Nigerian-listed Deposit Money Banks (DMBs).

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1: This table shows the result from descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	91	-0.10	0.26	.1342	2.19476
LTDR	91	.00	0.18	.2223	.48632
STDR	91	.00	8.82	.7584	1.73555
DER	91	-1.97	191.21	3.0868	11.73331
Valid N (listwise)	91				

Source: Author's Computation, 2025.

The results indicate that the ROA for listed banks in Nigeria averages 0.13, with a standard deviation of 2.19, suggesting stable performance during the study period. The highest ROA recorded is -0.10, while the lowest is 0.26.The long-term debt ratio (LTDR), the average stands at 22.23% (mean of 0.2223) with a standard deviation of 0.14. This low ratio indicates that Nigerian banks are increasingly reliant on less debt for growth, suggesting a relatively stable long-term financial position. The LTDR ranges from 0 to 0.18.The short-term debt to asset ratio (STDR) averages 75.84% (mean of 0.7584) with a standard deviation of 1.74, indicating that banks primarily use short-term financing. The STDR's range is from 0 to 8.82.Lastly, the debt-to-equity ratio (DER), which measures financial leverage, averages 3.09 (mean of 3.0868) with a substantial standard deviation of 11.73. This implies a low DER, suggesting that banks in Nigeria have not aggressively leveraged debt for growth, thus minimizing financial risks and potential earnings volatility. The range of DER recorded is from -1.97 to 191.21.

Regression Results

Tables 2and 3present the results of the regression analysis conducted.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.893[a]	.797	.790	1.00666	.797	112.352	2	88	.000	1.975

a. Predictors: (Constant), DER, LTDR, STDR
b. Endogenous Variable: ROA

Source: Author's computation, 2025.

Table 2 encapsulates the primary results derived from the regression analysis employed in this research. An R value of 89.3% is presented, signifying a substantial connection exists between the dependent and independent variables. Furthermore, the R-squared value is determined to be 0.797. This outcome demonstrates that the independent variables – long-term debt ratio (LTDR), short-term debt ratio (STDR), and debt-to-equity ratio (DER) – collectively explain 79.7% of the fluctuation in return on assets (ROA).

To assess the model's generalizability, we consider the adjusted R^2, which accounts for the number of predictors and estimates potential shrinkage in R^2 when applied to the broader population

(Gujarati & Sangeetha, 2007). In our analysis, R^2 is 0.797, and adjusted R^2 is 0.790. Their close proximity indicates minimal shrinkage, suggesting the model is not over-fitted and has good generalizability, with outcomes expected to deviate by only 0.7 percentage points (79.7 - 79). Furthermore, the F-statistic is calculated at 112.352, which reflects the overall significance of the model. This high F-statistic value points to a statistically significant relationship between the dependent variable (ROA) and the set of predictor variables (LTDR, STDR, and DER), with a significance level of 0.000000. This indicates that the overall regression equation is significant at 0 per cent, well below the commonly accepted threshold of 5 per cent in social sciences. Consequently, these findings suggest that the econometric model is robust and appropriately fitted at the 5 per cent significance level.

Table 3: Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.457	.122		3.736	.000		
	LTDR	.043	.259	.010	.167	.867	.720	1.389
	STDR	.230	.072	.182	3.179	.002	.719	1.390
	DER	-.164	.009	-.879	-18.062	.000	.999	1.001

a. Dependent Variable: ROA

Source: Author's Computation, 2025.

According to Table 3, the regression line yields an intercept of 0.457. In plain terms, this indicates that, holding all other variables constant, the Return on Asset (ROA) for the examined listed banks is projected to be 45.7 percent. This outcome is influenced by factors outside the scope of this particular analysis.

The model's output demonstrates a positive relationship between the long-term debt ratio (LTDR) and the banks' Return on Assets (ROA) within Nigeria. The beta coefficient for the long-term debt ratio (LTDR) is calculated at 0.10. Consequently, a one-unit alteration in the long-term debt ratio (LTDR) results in a negligible rise of 10 percent in the Return on Asset (ROA), thereby signifying a marginal and positive influence.

The model's output further highlights a beta coefficient of 0.182 pertaining to the short-term debt ratio (STDR). This suggests that fluctuations in the STDR, by a single unit, will correspond to a scarcely noticeable upward shift in the return on assets (ROA) experienced by Nigerian listed banks, amounting to 18.2 percent.

Furthermore, considering the debt-to-equity ratio (DER), the analysis reveals a negative correlation with the return on assets (ROA). A single unit variation in the debt-to-equity ratio (DER) precipitates a considerable decline in the return on assets, quantified at -0.879.

DISCUSSION OF FINDINGS

Analyzing the impact of the long-term debt ratio (LTDR) on the return on assets (ROA) of Nigerian-listed deposit money banks (DMBs), this research revealed a positive, yet inconsequential, connection between LTDR and ROA throughout the analyzed timeframe.

Consequently, the study's findings imply that LTDR does not exert a notable impact on the ROA performance of these Nigerian banks. These observed outcomes resonate with previous studies, such as Saeedi and Mahmoodi (2011), who similarly identified a lack of substantial relationship between capital structure and ROA, even while market performance showed a potential for positive correlation.

Regarding the connection between the Short-Term Debt Ratio (STDR) and the Return on Assets (ROA) for Nigerian listed DMBs, our investigation uncovered a positive and meaningful influence of the STDR on the ROA of these particular banks. This observation aligns with findings from Iorpev and Kwanum (2012), who studied the influence of capital structure on Nigerian manufacturing firms. They determined that the ratio of short-term debt to total assets significantly impacts performance, whereas long-term debt primarily affects profit margins. Furthermore, Al-Taani's (2013) work also corroborates this result.

> The research revealed a notable inverse correlation, statistically significant, between the debt-to-equity ratio (DER) and the return on assets (ROA) for Nigerian Deposit Money Banks (DMBs) that are publicly traded. In essence, greater reliance on DER for funding appears to coincide with a reduction in ROA. This conclusion is supported by prior studies.

Specifically, the study's outcomes are in agreement with the work of Khalifa (2014), who documented a detrimental influence of total debt on ROA. Further corroboration comes from Al-Taani (2013) and Iorpev and Kwanum (2012), whose findings point in the same direction.

CONCLUSION AND RECOMMENDATIONS

This research investigates how capital structure influences the operational effectiveness of Nigerian banks. The key aims were to assess the impacts of long-term debt ratio, short-term debt ratio, and debt-to-equity ratio on the return on assets (ROA) of these Nigerian financial institutions. Based on the financial data obtained and analyzed through ordinary least squares regression and hypothesis testing, the results suggest that the long-term debt ratio (LTDR) has a statistically insignificant effect on return on assets (ROA), while the short-term debt ratio (STDR) and the debt-to-equity ratio (DER) significantly influence the return on assets (ROA) of the listed Nigerian banks studied. Ultimately, the study concludes that a bank’s capital structure has a meaningful bearing on its overall financial performance within the context of listed banks in Nigeria.

Based on the study's outcomes, these recommendations are put forth:

i. Considering the study's findings, which indicate that while long-term debt has a statistically insignificant, yet positive effect on firm value, it's advisable for Nigerian listed banks to strategically use a combination of long-term debt alongside other financing options – particularly short-term debt – to elevate the firm's worth.

ii. It is recommended that Nigerian banks employ debt financing judiciously, using it primarily when absolutely critical. While debt can contribute to increased business value, a threshold exists where further debt accumulation becomes counterproductive. Therefore, each financial institution should identify and maintain its optimal debt-to-equity ratio to achieve maximum value.

iii. Nigerian banks must closely monitor their debt-to-equity ratio, acknowledging its significant impact on reducing the return on assets, as revealed in this study. Banks should prioritize improving their overall debt-to-equity ratio. This action will communicate positively to potential investors, thereby boosting share market investment, and ultimately, maximizing both the share price and overall firm value.

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