



Capital Structure and Firm Performance: Moderating Role of Firm Size and a study of Deposit Money Banks in Nigeria

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Abstract. This study empirically examined the moderating role of firm size in the relationship between capital structure and the performance of deposit money banks (DMBs) in Nigeria, with return on assets and Tobin's Q serving as performance indicators. Guided by four specific objectives and corresponding hypotheses, the research was anchored on the Pecking Order Theory (POT). The study covered all twelve (12) listed DMBs in Nigeria, which also formed the sample size. Secondary data were obtained from the audited financial statements of these banks for the period 2010–2024. The analysis employed the Panel Autoregressive Distributed Lag model to estimate both short-run and long-run dynamics of the impact of capital structure on bank performance with firm size as a moderating variable. The findings revealed that, when firm size was introduced as a moderator, the effects of equity-to-total-assets and debt-to-total-assets reversed in sign and became significant in the long run under both performance measures (return on assets and Tobin's Q). In the short run, these effects were insignificant under return on assets but significant under Tobin's Q. This indicates that firm size significantly influences the relationship between capital structure and DMB performance. The study recommended that bank shareholders should prioritize an optimal capital structure mix that maximizes profitability while taking into account the size of their bank.

Keywords: Capital Structure, Deposit Money Banks, Firm Size and Moderating role,

1. Introduction

Firm performance is the major concern of every investor, stakeholders as well as the economy. Given that, the wellbeing and survival of every corporation can be traced through the firm performance, therefore, financial managers employ the necessary policies and strategies that are related to finance in order to attend an optimum capital structure in their different corporations so as to enhance their performance (Ankamah-Yeboah, *et al.*, 2021). These policies and strategies employed by managers are influenced by the size of the firm. Therefore, different firm size employs different policies and strategies for their firm better performance. Hence, the mediating role of firm size on the relationship between capital structure and firm performance is a well-researched yet nuanced topic in the field of corporate finance. While capital structure decisions are central to a firm's financial strategy, their effect on performance is not uniform across all firms. A growing body of empirical and theoretical literature suggests that firm-specific characteristics, particularly firm size, significantly influence the relationship between capital structure and firm performance, thereby necessitating a more contextualized and understanding and investigation (Imasuen, 2022).

Capital structure refers to the mix of debt and equity a firm uses to finance its operations and growth. Traditionally, financial theories such as Modigliani and Miller's (1958) Capital Structure Irrelevance Theory, Trade-off Theory, and Pecking Order Theory have been used to explain the impact of leverage on firm performance. However, empirical findings across different contexts show mixed results, sometimes positive, sometimes negative, and sometimes neutral

by indicating that capital structure's impact on performance is contingent upon moderating factors such as industry, market conditions and most notably firm size.

Firm size plays a critical role in shaping the capital structure–performance relationship because it is closely tied to various strategic, operational, and financial characteristics. Larger firms typically enjoy economies of scale, more stable cash flows, better access to capital markets, and stronger bargaining power with lenders. These factors can mitigate the risks associated with high leverage, such as financial distress and agency costs, thus allowing large firms to potentially utilize debt more efficiently to enhance performance.

In contrast, smaller firms often face greater financial constraints, higher borrowing costs, limited access to capital, and greater vulnerability to market fluctuations. Consequently, the same level of leverage that may benefit a large firm can harm a small one by increasing the likelihood of distress and reducing operational flexibility. Therefore, firm size does not merely influence the firm's ability to raise capital, it alters the economic consequences of capital structure decisions firms make. Hence, it becomes necessary for the current study to empirically investigate the moderating role of firm size in the impact of capital structure on firm performance using the Nigerian banking subsector which is the locomotive room of the financial sector.

1.1 Statement of Problem

Firm size is a critical contextual factor that moderates the relationship between capital structure and firm performance. Understanding this moderating effect provides more accurate insights into financial decision-making and offers a nuanced framework for evaluating firm-specific financing strategies. As such, researchers and practitioners must consider firm size not merely as a control variable but as a central component of financial strategy analysis. Hence, the necessity for this study to examine the moderating role of firm size on the impact of capital structure on the firm performance using the deposit money banks in Nigeria. According to the Resource-Based View (RBV), larger firms typically command more internal resources and capabilities that help them leverage external financing for competitive advantage, whereas smaller firms may lack such assets and experience

diminishing returns or adverse effects from excessive leverage.

However, from the empirical viewpoint, how true is this hypothesis? Also, few studies done using firm size as the moderator were outside the shores Nigeria (Marwan, *et al.*, 2023; Tabassum, *et al.*, 2023), and lastly, most studies in this area have used ordinary regression analysis. This study advanced previous studies by moderating the role of firm size in the relationship between capital structure and firm performance and also by using auto regressive distributed lag (ARDL) in the context of Nigerian banking system of which previous studies have not done, thus, creating a gap which this study is to fill.

1.3 Objectives of the Study

The main purpose of this study is to determine the moderating role of firm size on the relationship between capital structure and financial performance of quoted DMBs in Nigeria. Specifically, the objectives are to:

examine the impact of debt financing on the financial performance of quoted DBMs in Nigeria

- determine the impact of equity financing on the financial performance of quoted DBMs in Nigeria
- examine if firm size has moderating impact on the relationship debt financing and financial performance of quoted DMBs in Nigeria
- examine if firm size has moderating impact on the relationship between equity financing and financial performance of quoted DMBs in Nigeria

2. Literature Review

The review of related literature was done under the following subheadings: Conceptual literature review, theoretical literature review and the empirical literature review.

2.1 Conceptual Literature Review

The conceptual review was done using a framework that showed the relationship between the dependent, independent variables and the moderating variable. The dependent variables in the study firm performance (ROA and Tobins Q), and the independent variable is capital structure (equity financing and debt to equity), while the moderating variable is the firm size.

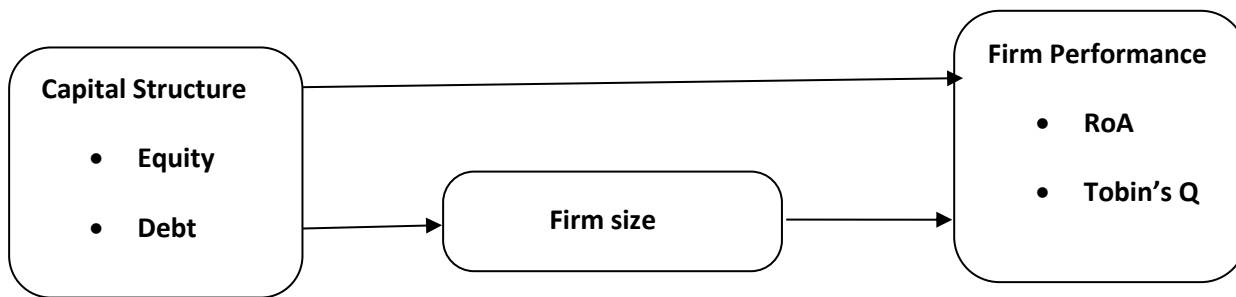


Figure 1: Conceptual Framework of capital and firm performance.

The relationship between equity financing and firm financial performance depends on how efficiently the capital is used, the firm's life cycle stage, and investor perception. While equity financing reduces financial risk and increases funding for growth, it can dilute earnings and ownership if not managed well. According to Basit and Irwan (2017) equity ratio has an insignificant correlation with the firms' financial performance. Conversely, Chechet and Olayiwola (2014) established that equity financing is positively related to financial performance, using panel data through the annual reports of the listed companies under the Nigerian Stock Exchange.

In theory, the relationship between debt financing and firm financial performance is conditioned by trade-offs between risk and return. Most theories converge on the idea that an optimal mix of debt and equity maximizes performance, but excessive reliance on either can erode firm value. The actual impact depends on the firm's environment, market conditions, and strategic choices. It is the cornerstone of corporate finance theory and practice. This relationship is critical because the way a firm finances its operations, whether through debt, equity, or a combination of both, has a direct and measurable impact on its profitability, financial risk profile and overall shareholder value. Uremadu and Onyekachi (2018) opined that total debt ratio has a negative and insignificant effect on ROA. Also, Basit and Irwan (2017) examined the effect of capital structure on firms' performance on Malaysian industrial sector. Debt showed a negative effect on ROA of the firm.

Firm size is one of the most acknowledged determinants of firm performance (Obaje, *et al.*, 2021). Akinyomi and Olagunju (2013) are of the opinion that in today's world firm size is very critical to performance due to the phenomenon of economies of scale. Essentially, it means larger entities can obtain cost leadership relative to smaller firms. Firms' size is seen as a resource in obtaining sustainable competitive

advantage in terms of profit and market share. Firm size can be defined in form of total assets, total investment, net worth of the firm and others. Firm size has significant influence on firm's performance and firm's value directly or indirectly as reported by Obaje, *et al.*, 2021) while debt finance addresses a tax advantage to the businesses. In addition, capital structure is appropriate to the businesses value and that businesses are capable to maximise their value by increasing debt level in their capital structures. The financing choice refers to the business decisions because an optimal capital structure that shows a corporate financing mix is likely to maximise the market share price as well as the value of the business.

2.1.1 Firms Performance Review

Firm performance helps to indicate the result of investment activities of the business, thus create signals to the public in relation to business value to enhance investors' economic decisions making (Eitokpa cited in Sukesti *et al.*, 2021). In the banking subsector, firm performance is measured in financial terms. Financial performance refers to the extent to which financial objectives are met or have been met. It is also used as a broad indicator of a firm's long-term financial health. Financial performance is the concern of most managers and business owners today. To attain the desired financial performance, management effectiveness and efficiency are required to make use of a company's resources. Hence, the concept of financial performance is mostly measured using return on equity, return on capital employed, return on assets, return on investment, and net interest margin (Suu *et al.*, 2020) and Tobin's Q. For this study return on asset and Tobin's Q were used to measure financial performance of a firm.

2.1.2 Return on Asset (ROA) Review

Return on asset is a very important measure of banks profitability (Ahmed *et al.*, 2018). A business's ROA

can be used by an investor or manager to assess how well it generates profits from its assets (Ngwoke & Ugwu, 2024). Return on Assets (ROA) is a metric used to assess how profitably a company utilises its financial resources. Unlike other metrics, ROA takes a company's debt into consideration. How well a company converts investment capital into net income is shown by the ROA measure (Olayemi & Fakayode, 2021). It is the anticipated rise in cash flows brought about by expenditures for investments or assets within the operational cycle.

2.1.3 Tobin's Q Review

Tobin's Q (also known as Kaldor's q and v ratio) is the ratio of an asset's market value to its replacement value; a measure of the value of the company based on the market. Tobin's Q was first introduced by Nicholas Kaldor in 1966 but was popularized by James Tobin a decade later. If market value reflected only a company's registered assets, Tobin's Q would be 1. If Tobin's Q is greater than 1.0, then the market value is greater than the company's registered value active as described by Tobin and Brainard (1976). This suggests that the market value reflects some unvalued or unrecognized assets of the company. High values of Tobin's Q encourage companies to invest more in the capital because they are "worth" more than the price they paid for it. Tobin's Q measures two variables: the current price of capital assets, as measured by accountants or statisticians and the market value of stocks and bonds (Imasuen, 2022).

2.1.4 Capital Structure Review

The concept of capital structure is the firm's financial framework which consists of debt and equity used to finance firm. Mbonu and Amahalu (2021) described capital structure as the particular combination of debt and equity used by company to finance its operations and growth. Capital structure means the source of capital of a firm which come from either debt or equity, or the combination of both debt and equity. The proportion in which a firm finance its activities is described in the form of debt-to-equity ratio. It indicates the proportion of the ownership of company in the capital (Mbonu & Amahalu, 2021). Debt is the proportion of firms' capital that did not come from the owners, thus, is an obligation to be paid with interest. It can either be long-term debt or short-term debt. While equity described the proportion of firm's capital that is invested by the owners of the business. Therefore, capital structure increases the ability of the company to find new wealth thereby creating investment opportunities (Maama & Mkhize, 2020). Debt financing involves the borrowing of money,

whereas equity financing involves selling a portion of equity in the company. The main advantage of equity financing is that there is no obligation to repay the money acquired through it. While with debt finance there is obligation required to repay the money plus interest over a set period of time, typically in monthly instalments.

2.1.5 Firm Size Review

Firm Size serves as the moderating variable in this research. This is indicated by the scale of operations, resource availability, market power and bargaining leverage. Firm size can be measured using various proxies, including total assets, revenue and market capitalisation. Studies have shown how significant the size of a firm is in the actualisation of financial performance. Raja and Kumar (2005) posit that firm size exhibits a positive relation with the performances of listed firms. Becker, *et al.*, (2005) argue that firm size has a strong association with a firm's survival, profitability and productivity. Bikker and Hu (2002); Kosmidou and Pasiouras (2007) argued that size has a positive impact on a bank's performance. In a competitive business environment like the banking sector in Nigeria, the size of a firm is of paramount importance as the cost of production tends to be high due to the provide-it-yourself syndrome where the firm has to provide for the light, water, security, etc. These things go on to increase the cost of production of goods and provision of services, which only large firms can cope with (Becker, *et al.*, 2005).

2.1.6 Moderating Role of Firm Size Review

Empirical studies have highlighted these dynamics. For instance, Abor (2005) finds that while leverage is positively related to firm performance in large firms due to tax shield advantages, it can negatively affect smaller firms due to their inability to manage financial risk. Similarly, Frank and Goyal (2009) argue that the impact of leverage varies significantly across firm sizes, with size acting as a proxy for information asymmetry and market access. Moreover, interaction effects between firm size and capital structure have been demonstrated in multiple regression models, where the inclusion of an interaction term (*Leverage* × *Firm Size*) reveals how the slope of the capital structure–performance relationship changes with variations in size. These models support the notion that firm size not only correlates with capital structure and performance but actively modifies the nature of their linkage.

2.2 Theoretical Literature Review

2.2.1 The Modigliani-Miller (M&M) Theorem

The seminal work of Modigliani and Miller (1958) serves as the foundation for modern capital structure discourse. In their initial "Irrelevance Proposition," they argued that under the assumptions of a perfect capital market—characterized by the absence of taxes, transaction costs, and asymmetric information—a firm's value is determined solely by its earning power and the risk of its underlying assets, independent of its debt-to-equity ratio. However, acknowledging the role of market imperfections, Modigliani and Miller (1963) revised their position to include corporate taxes. They posited that interest payments on debt are tax-deductible, creating an "interest tax shield." This implies that the value of a leveraged firm (V_L) exceeds that of an unleveraged firm (V_U) by the present value of the tax shield:

$$V_L = V_U + T_C D$$

Where T_C is the corporate tax rate and D is the market value of debt. This revised model suggests that firms should maximize debt to minimize their Weighted Average Cost of Capital (WACC).

2.2.2 Static Trade-Off Theory

Building upon the M&M tax-shield premise, the Trade-Off Theory suggests that firms seek an "optimal" capital structure by balancing the tax benefits of debt against the costs of financial distress (Kraus & Litzenberger, 1973). As a firm increases its leverage, the marginal benefit of the tax shield initially outweighs the marginal cost of potential bankruptcy.

The theory posits that there is an inflection point—the optimal debt ratio—beyond which the expected costs of financial distress (including legal fees and loss of customer confidence) begin to erode firm value. Consequently, firms with stable cash flows and tangible assets (which serve as collateral) are expected to maintain higher debt ratios than firms with volatile earnings or intangible assets.

2.2.3 Pecking Order Theory

The Pecking Order Theory, initially suggested by Donaldson (1961) and rigorously developed by Myers and Majluf (1984), challenges the notion of a target debt-equity ratio. Grounded in the concept of asymmetric information, the theory suggests that managers possess superior information regarding the firm's true value compared to outside investors. To minimize the "adverse selection" costs associated with

this information gap, firms follow a strict financing hierarchy:

Internal Equity: Retained earnings are preferred as they incur no information costs.

Debt: If internal funds are exhausted, firms issue debt, which is seen as a less risky signal than equity.

External Equity: Issuing new shares is a last resort, as it often signals to the market that the stock is overvalued, leading to a share price decline.

In the context of the banking sector, this hierarchy is highly evident as profitable banks prioritize retained earnings and low-cost deposits over the issuance of new capital, which avoids the dilution of ownership and negative signaling (Anarfo & Appiahene, 2017).

2.2.4 Agency Theory

Agency Theory, pioneered by Jensen and Meckling (1976), examines the conflicts of interest between a firm's stakeholders, specifically between managers (agents) and shareholders (principals). Capital structure is viewed as a mechanism to mitigate these "agency costs."

Conflict of Equity: Managers may pursue personal perks or "empire building" at the expense of shareholders. High debt levels act as a disciplinary tool, as the contractual obligation to make interest payments reduces the "free cash flow" available for managerial waste (Jensen, 1986).

Conflict of Debt: Conversely, high leverage may lead to the "asset substitution" problem, where shareholders take on excessively risky projects because they enjoy the upside while debtholders bear the downside risk.

2.2.5 Market Timing Theory

The Market Timing Theory, popularized by Baker and Wurgler (2002), suggests that a firm's capital structure is not the result of a deliberate search for an optimal ratio, but rather the cumulative outcome of past attempts to "time" the equity market. Managers issue equity when market valuations are high (low cost of equity) and repurchase shares or issue debt when market valuations are low. Under this view, the current debt-to-equity ratio is simply a historical reflection of a manager's ability to exploit temporary fluctuations in the cost of different capital sources.

2.3 Empirical Literature Review

Enamuotor and Ehiedu (2025) investigated the effect of capital structure on firm performance among selected firms listed on the Nigerian Exchange Group

(NGX), utilizing a mixed-methods research design to capture both numerical evidence and contextual understanding. The quantitative phase of the study analyzes data from fifty (50) firms across key sectors such as, manufacturing, banking, telecommunications, oil and gas, over a seven-year period (2015 –2021). Capital structure variables such as debt-to-equity ratio, long-term debt ratio, and total debt ratio were evaluated against performance indicators like return on equity (ROE), return on assets (ROA), and earnings per share (EPS). To complement the quantitative findings, qualitative data were obtained through semi-structured interviews with ten (10) senior financial managers and chief finance officers (CFOs) within the sampled firms. The interviews explored the rationale behind capital structure decisions, challenges in capital sourcing, and the perceived impact of financing choices on operational efficiency and shareholder value. Findings from the quantitative analysis reveal that while moderate levels of debt can enhance firm performance, excessive leverage tends to erode profitability and increase financial distress risk. Conversely, firms that rely solely on equity financing often face higher capital costs and diluted control. The qualitative insights underscore the importance of strategic financial planning, industry dynamics, and macroeconomic factors such as interest rates and inflation in capital structure decisions.

Similarly, Ozondu and Egbunike (2024) analysed listed DMBs in Nigeria and reported a significant relationship between capital structure components and financial performance indicators, concluding that effective leverage management enhances bank profitability. Olagunju et al. (2024), controlling for firm size and asset structure, found that changes in capital structure exerted a positive but statistically insignificant influence on financial performance, suggesting that firm size may weaken or condition the leverage–performance nexus. Tabassum, *et al.* (2023) explored the impact of capital structure on the firm performance: moderating role of firm size. Data were collected from the annual reports of the Pakistan commercial banks from the years 2011 to 2020. The banks included were Allied Bank Limited, Askari Bank Limited, Habib Bank Limited, MCB Bank Limited, Meezan Bank Limited, Faysal Bank Limited, United Bank Limited, Silk Bank Limited, National Bank of Pakistan and Bank Al-Habib Limited. Data were collected in respective to the independent and dependent variables including ROE, ROA, total asset, total debt and equity. It was validated that the firm performance is largely dependent on the firm capital structure specifically in terms of debt and equity. As the independent variables, total equity and debt has been resulted as the significantly correlated with the

dependent variable ROE and ROA. Whilst the moderating variable total asset also has the significant impact on the dependent variables.

Abdulwahab *et. al.* (2022) examined the effect of capital structure on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria, with board financial literacy as a moderating variable. Using panel data from 2012–2021 and regression analysis, the findings revealed that capital structure variables had no significant direct effect on firm performance. However, when moderated by board financial literacy, the relationship became significant, indicating that institutional competence strengthens the effectiveness of leverage decisions. The study concluded that firm-specific governance attributes are crucial in explaining performance outcomes in the Nigerian banking sector.

Mohammed *et. al.* (2021) examined capital structure, board size and financial performance of listed deposit money banks in Nigeria. The study employed board size as moderating variable in the relationship between capital structure and the financial performance of listed Deposit Money Banks (DMBs) in Nigeria. The study adopts correlation and ex-post facto as research design. The population of the study consists of 14 listed DMBs in Nigeria a using purposive sampling technique and a Multiple regression model based on pooled Ordinary Least Square (OLS) to analyse the panel data obtained from audited financial statements of the sampled listed DMBs between 2011- 2020. The study further reveals that board size moderated the relationship between equity financing ratio and financial performance of listed DMBs in Nigeria. The study further revealed that equity financing ratio as moderated by board size influences financial performance.

Sanusi *et. al.* (2020) assessed the impact of capital structure on the financial performance of deposit money banks in Nigeria. The study adopted an ex-post facto research design and it considered variables long term debt to Asset (LTD/TA), Short term debt to total Asset (STD/TA) and Total debt to total Asset (TD/TA) of capital structure and financial performance which was proxy by Return on Asset (ROA). The study sourced secondary data using a convenient sampling technique based on the availability of data as at the period of the study. These data were obtained from annual financial report of the five sampled Deposit Money Banks in Nigeria covering a period of 2009 - 2018. The data obtained were analysed using descriptive statistic (i.e. mean and standard deviation) and inferential statistic (i.e. Pearson correlation and regression analysis). The results of the analysis revealed that STD/TA and TD/TA have significant

positive impact on ROA. While has insignificant positive impact on ROA.

3. Research Method

3.1 Theoretical framework

The capital structure theory underpinning this study is Pecking Order Theory. The Pecking-Order Theory was introduced by Donaldson (1961) and developed by Myers and Majluf (1984). According to Swail, Lwiza, and Ndanshau (2015), the capital structure theory suggests that financing a business firm's operations depends on the order of the costs of funds. The theory opined that financing flow is hierarchical, and that firms are more interested in internal over external financing while debt is also preferred to equity financing in a bid to reduce costs of asymmetric information possessed by the inside managers.

This theory applies to banks' capital structure, which is most preferable to use retained earnings of banks to finance is most preferable while raising of short-term debts by banks are still much easier and cost less compared to the issuing new equity capital. This is because retained earnings represent internal source of funds at no cost, deposits mobilisation are core functions of the banks and the tax benefits of debt financing make them more preferable to equity capital. Apart from this, issuing new equity portends negative signal of over valuation of share to the shareholders and dilution of their voting rights. Thus, it is preferable for banks to use deposits to finance risk assets than issuing new equity as capital in order to increase values at a reduce cost. Therefore, banks that have higher profits would maintain a low debt ratio since they are able to mobilize funds internally provided other factors remain constant. As observed by Anarfo and Appiahene (2017) that the theory suggests profitable banks depend less on borrowed funds because of the available internal finance hence, a negative relationship exist between debt capital and profitability.

3.2 Model Specification

This study adopts Shaba, Yaaba, and Abubakar (2016) model of

$$GE_t = \delta_0 + \delta_1 OF_t + BF_t + u_t \quad (1)$$

Where GE represents firm financial performance proxied by gross earnings, OF denotes owners' funds represented by shareholders' equity, BF stands for

borrowed funds proxied by total deposit liabilities and debt, μ is the error term, δ_0 is a constant, δ_1 and δ_2 are coefficients of their respective variables and t is time dimension.

Adopting the model and changing GE to FP , OF to EQ and BF to DE , thus

Where FP is firm performance, EQ is equity to total assets ratio DE is debt to total assets ratio and CS is capital structure

$$FP = \beta_0 + \beta_1 EQ + \beta_2 DE + u_t \quad (2)$$

$$FP = \beta_0 + \beta_1 EQ + \beta_2 DE + \beta_3 EQ*FS + \beta_4 DE*FS + u_t \quad (3)$$

Applying the panel effect

$$FP_{it} = \beta_0 + \beta_1 EQ_{it} + \beta_2 DE_{it} + \beta_3 EQ_{it}*FS_{it} + \beta_4 DE_{it}*FS_{it} + u_t \quad (4)$$

3.3 Method of Data Analysis

The Panel Autoregressive Distributed Lag (PARDL) model was used estimate both short-run and long-run dynamics of the impact of capital structure on bank performance with firm size as a moderating variable

3.4 Source of Data Collection

The study used the secondary sources of data and were extracted from the audited financial statements of the quoted DMB's of various editions within the time frame of the study.

4. Analysis and Discussion of Regression Result

To determine the application of ARDL, the Phillips–Perron (PP) unit root test was applied.

Table 1: Panel Unit Root Test Using PP

Variable /Integration Order	P-value
$D(DE)$	0.0100
$D(EQ)$	0.0000
$D(DE*FS)$	0.0000
$D(EQ*FS)$	0.0000
ROA	0.0000
TQ	0.0311

Source: Researchers Computation using information from e-views 12 output (2025).

The result of table 1 revealed that four (4) of the variables were stationary at first difference (DE , EQ , $DE*FS$ and $EQ*FS$) while ROA and TQ were stationary at level. Since there was a mixed effects of level and first difference in the determination of the stationality, the study applied ARDL, thus determining the long-run and short-run dynamics between variables. Also, the study applied log to checkmate the presence of heteroskedasticity, thus;

ARDL

For $Y = f(x)$

(5)

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 X_{t-1} + U_t \quad \text{for long run}$$

(6)

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta Y_{t-1} + \alpha_2 \Delta X_{t-1} + U_t \quad \text{for short run}$$

(7)

Short run equation

Applying equ (7) into equ (4), thus

$$\log \Delta FP_{it} = \beta_0 + \beta_1 \log \Delta EQ_{it-1} + \beta_2 \log \Delta DE_{it-1} + \beta_3 \log \Delta (EQ * FS)_{it-1} + \beta_4 \log \Delta (DE * FS)_{it-1} + \beta_5 \log \Delta FP_{it-1} + u_t \quad (8)$$

Long run equation

Applying equ (6) into equ (4), thus

$$\log FP_{it} = \beta_0 + \beta_1 \log EQ_{it-1} + \beta_2 \log DE_{it-1} + \beta_3 \log (EQ * FS)_{it-1} + \beta_4 \log (DE * FS)_{it-1} + \beta_5 \log FP_{it-1} + u_t \quad (9)$$

Decomposing FP into ROA and Tobin's Q (TQ)

Short run equation for ROA

$$\log \Delta ROA_{it} = \beta_0 + \beta_1 \log \Delta EQ_{it-1} + \beta_2 \log \Delta DE_{it-1} + \beta_3 \log \Delta EQ * FS_{it-1} + \beta_4 \log \Delta DE * FS_{it-1} + \beta_5 \log \Delta ROA_{it-1} + u_t \quad (10)$$

Long run equation for ROA

$$\log ROA_{it} = \beta_0 + \beta_1 \log EQ_{it-1} + \beta_2 \log DE_{it-2} + \beta_3 \log EQ * FS_{it-1} + \beta_4 \log DE * FS_{it-1} + \beta_5 \log ROA_{it-1} + u_t \quad (11)$$

Short run equation for Tobin's Q

$$\log \Delta TQ_{it} = \beta_0 + \beta_1 \log \Delta EQ_{it-1} + \beta_2 \log \Delta DE_{it-1} + \beta_3 \log \Delta EQ * FS_{it-1} + \beta_4 \log \Delta DE * FS_{it-1} + \beta_5 \log \Delta TQ_{it-1} + u_t \quad (12)$$

Long run equation for ROA

$$\log TQ_{it} = \beta_0 + \beta_1 \log EQ_{it-1} + \beta_2 \log DE_{it-2} + \beta_3 \log EQ * FS_{it-1} + \beta_4 \log DE * FS_{it-1} + \beta_5 \log TQ_{it-1} + u_t \quad (13)$$

5. Result Presentation and Analysis

Table 2: Panel ARDL Estimation Results

	ROA			TQ		
	coeff	T-stat	p-value	coeff	T-stat	p-value
<i>Short Run (SR)</i>						
D(logEQ)	2.510511	0.80482	0.4227	2.097222	2.50588	0.0136
D(logDE)	-6.34022	-2.4115	0.0176	-3.293052	-3.5837	0.0005
(logEQ*FS)	-4.814145	-1.8897	0.0615	-2.573403	-3.4094	0.0009
logDE*FS	4.786654	1.8893	0.0615	2.757601	3.49186	0.0007
ECM	-0.457832	-3.2652	0.0015	-0.379417	-3.5763	0.0005
<i>Long Run (LR)</i>						
logEQ	-20.84003	-3.595	0.0005	-4.469574	-2.083	0.0394
logDE	22.60092	3.77081	0.0003	3.853215	1.82703	0.0703
logEQ*FS	21.6622	3.69302	0.0003	4.203393	1.99159	0.0488
logDE*FS	-21.46183	-3.6732	0.0004	-4.304828	-2.0367	0.044

Source: Researchers' Computation using information from e-views 12 output (2025).

The results of table 2 revealed that under ROA, the ECM showed that the speed of adjustment from short run long run equilibrium was 45.7% annual and it is significant because the p-value was less than 5%. A breakdown of the result, revealed that in the SR equity to total assets ratio has positive impact on the DMBs performance using ROA, however, it is not significant. Also, debt to total assets ratio has negative and significant impact on DMBs performance using ROA as a measure of firm performance. When moderating equity to total assets ratio with firm size, the result revealed that equity to total assets ratio has negative impact of DMBs performance, however, it was not significant. Also, when moderating debt to total asset with firm size, the result revealed that it has positive impact on DMBs performance, however, it was not significant. The result revealed that when moderating

capital structure of a firm with the firm size the result is inversed in terms of sign. Without any moderation with firm size, the results revealed that equity to total asset had positive impact while debt to total asset had negative impact, however, when moderated with firms size the signs was inversed. This means that firm size had moderating effect on the direction of DMBs performance, although not significant.

In the LR, the result revealed that equity to total asset ratio had negative and significant impact on DMBs performance (ROA). Also, debt to total asset ratio had positive and significant impact on DMBs performance (ROA). However, when moderated with firm size, the result revealed that equity to total asset had positive and significant impact on DMBs performance (ROA). Also, when moderated with firm size, debt to total

asset ratio had negative and significant impact on DMBs performance (ROA). The result revealed a inversed sign impact when capital structure was moderated with firm size.

Under Tobin's Q (TQ) as a measure of firm performance the ecm showed that the speed of adjustment from short run long run equilibrium was approximately 38% annual and it is significant because the p-value was less than 5%. A breakdown of the result, revealed that in the SR equity to total assets ratio has positive impact on the DMBs performance using TQ, however, it is not significant. Also, debt to total assets ratio has negative and significant impact on DMBs performance using TQ as a measure of firm performance. When moderating equity to total assets ratio with firm size, the result revealed that equity to total assets ratio has negative and significant impact of DMBs performance. Also, when moderating debt to total asset with firm size, the result revealed that it has positive and significant impact on DMBs performance. The result revealed that when moderating capital structure of a firm with the firm size the result showed an inversed direction impact. Without any moderation with firm size, the results revealed that equity to total asset had positive impact while debt to total asset had negative impact, however, when moderated with firms size the signs were inversed. This means that firm size moderating effect had impact on the direction of DMBs performance, and was significant, unlike when ROA was used as a measure of firm performance

In the LR, the result revealed that equity to total asset ratio had negative and significant impact on DMBs performance (TQ). Debt to total asset ratio had positive and insignificant impact on DMBs performance (TQ). However, when moderated with firm size, the result revealed that equity to total asset had positive and significant impact on DMBs performance (TQ). When moderated with firm size, debt to total asset ratio had negative and significant impact on DMBs performance (TQ). The result revealed an inversed sign impact when capital structure was moderated with firm size.

6. Discussion of Findings

This study had investigated the impact of capital structure and firm performance, and when moderated with firm size, the impact of capital structure of firm performance was inversed in terms of sign. This meant that firm sign had a moderating effect on the impact of capital structure on DMBs performance. This outcome underscores the pivotal role of qualitative strategic financial planning, under industry dynamics, and

macroeconomic factors such as interest rates exchange rate fluctuation and inflation in capital structure decisions. This study validates the study of Tabassum et al (2023) who explored the impact of capital structure on the firm performance: moderating role of firm size and found that the firm performance is largely dependent on the firm capital structure specifically in terms of debt and equity. As the independent variables, total equity and debt has been resulted as the significantly correlated with the dependent variable ROE and ROA. Whilst the moderating variable total asset also has the significant impact on the dependent variables

Conclusion and Recommendations

This study examined the moderating role of firm size on financial performance of selected deposit money banks in Nigeria using panel data for the period of fifteen years 2010 to 2024 and twelve (12) DFMBs listed on the floor of the Nigerian Exchange Group (NGX). The Panel Auto Regressive Distributed Lag (PARDL) analysis was employed to determine the short and long runs dynamics of the impact of capital structure on the performance of the Nigerian deposit money banks and banks performance measured by ROA and Tobins Q and moderated with firm size. The findings of the study showed that when moderated with firm size the impact of equity to total asset and debt to total asset was inverse significant in the Long Run under the measure of firm performance (ROA or TQ). However, under ROA in the Short Run, it was insignificant, but under TQ it was significant. This implies that firm size had the appropriate sign direction and significant effect on the impact of capital structure on DMBs performance within the study period.

Based on these findings, the following recommendations were made:

- i. Shareholders should consider the size of their firms in determining the best mix of capital structure mix that give the firm the maximum profit.
- ii. Nigerian banks should consider the use of more equity financing in the short run in their capital structure as this will have significant impact on their performance (RoA and TQ)
- iii. Nigerian banks should consider the use of more debt financing in the long run in their capital structure as this will have significant impact on their Return on Assets

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