

CAPITAL STRUCTURE AND PROFIT PERFORMANCE OF NIGERIA'S TOP FIVE PUBLICLY LISTED DEPOSIT MONEY BANKS (2003 – 2022)

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Abstract: The research investigated the effect of capital structure on the profit performance of Nigeria's top five publicly listed banks. The ex-post facto design method was used in this study while secondary data were used were gathered from annual reports from top five publicly listed banks (Zenith Bank, Guaranty Trust Bank, First Bank of Nigeria, Eco Bank Nigeria and Access Bank) which are among those rated by the Central Bank of Nigeria covering a period of 20 years (2003–2022). Pooled Panel Least Squares Regression was employed as a statistical method with aid of STATA 15 software. Result indicates that EQR exert a negative but non-significant effect on the ROA of the banks of study with regression coefficient of -40.89 and p-value of -1.8584 However, ICR exert negative and significant effect on ROA of the banks with correlation coefficient of -.000204 and p-value of .00180 which is less than 0.05. To that effect the alternative hypothesis which states that ICR has significant effect on ROA is accepted. This implies that a unit increase in ICR would bring about -.0002 reduction in the ROA of the banks. Furthermore, DTR, LEV and DER all have positive but non-significant effect on ROA of the banks. From the result of the analysis, the study concludes that capital structure elements have varied effect on ROA of banks of study most of which were non-significant. The study recommends that banks should rely mostly on equity financing as the debt financing has negative effect on the financial performance of the firms as EQR, DER and ICR show negative effect of debts on the financial performance of banks. The interest coverage ratio, which shows the rate of income relative to interest adversely affect the firms.

Keywords: Capital Structure. Debt financing, equity financing, banks Nigeria

1 Background of the Study

Finance is a critical factor in the sustainability, growth, and existence of any organization. The availability of finance is critical in running a business's daily operations. It is the source of all life. Many businesses failed within a few years of their inception due to a lack of capital. Similarly, how a company finances its daily operations and various investments has an impact on its survival and existence. A company can generate funds internally through retained earnings from profits or externally through equity or debt. The issuance of shares to the general public to generate funds is referred to as equity, whereas debt refers to borrowings made by firms through the issuance of bonds or debentures. The external source provides a company with three options for financing its investments: 100% equity, 100% debt, or a combination of debt and equity (Olayemi & Fakayode, 2021).

According to Olaoye, et al (2020), capital structure is the decision about how a firm's various sources of funds are combined to finance its operations and capital investments. These sources include long-term debt financing, also known as debt financing, as well as preferred and common stock, also known as equity financing. One of the most important goals of financial managers is to maximize shareholder wealth by determining the best combination of financial resources for a company and to maximize company value by deciding where to invest their resources (Yakubu, et al., 2016).

Debt can damage a company's value by exacerbating financial difficulties and overvaluation; on the other hand, too little debt can lead to underfunding and adversely affect returns, especially in large and matured companies. As a result, it is critical to make the right decision when deciding optimal capital structure, which will eventually result in growth, the value of investment made, and the different aspects of investors, particularly equity investors. Notwithstanding, the agency cost theory suggests that an optimal capital structure can be achieved by lowering the costs associated with conflicts between managers and owners. Jensen and Meckling (1976) contended that leverage level can be used to monitor managers' efforts to pursue the overall firm's objectives rather than their own. Costs are reduced, resulting in efficiency, which will ultimately improve firm performance (Brealey, et al., 2011). According to the Agency theory, the introduction of more leverage in financing the company is the only control mechanism to checkmate the management staff' abuses of power in pursuing the company's desired goal. If more debt is used, the risk of liquidation, debt servicing, and possibly job loss for management staff will result in cost reduction, resulting in efficiency and, ultimately, performance improvement. Capital structure decisions continue to be the most important financing decisions in the corporate world. This decision has an impact on both company profit performance and returns to capital providers (Adeoye & Olojede, 2022).

Profit performance, on the other hand, affirms the most efficient use of resources and the ability to generate a profit. It is a significant point of view for stakeholders (depositors, creditors, shareholders, the government, and managers) because it indicates how well and sound an organization is performing. The ability to operate efficiently, profitably, survive, grow, and respond to environmental risks and opportunities is referred to as financial performance. Profitability is only involved with the company's profits and losses (Ibrahim, et al., 2017). Its primary goal is to ascertain the operating and financial attributes, as well as the performance and effectiveness of economic unity management, as evidenced in financial records and reports (Ezejiofor & Erhirhie, 2018).

Profit performance depicts how well or poorly a company uses its assets to generate additional revenue. It is one of the variables used by investors and shareholders to assess a company's financial position and sustainability. Profitability is frequently used to assess performance (Akinyemi, et al., 2018). Capital structure is important in financial decision-making because it maximizes a company's performance and value. As a matter of fact, this study aims to fill a gap in the field of capital structure as it relates to the performance of five top deposit money banks in Nigeria using only return on asset to determine the effect of Equity ratio (ER), Debt ratio (DE), Debt-Equity ratio (DER), leverage ratio (LRA) and interest cover ratio (ICR) as surrogates of capital structure on the profit performance of deposit money banks in Nigeria.

1.2 Statement of the Problem

Despite deposit money banks recapitalization from two billion Naira to twenty-five billion Naira in 2005 and subsequent implementation of the international reporting financial accounting standard in 2012, Nigerian Deposit Money Banks (DMBs) have recently experienced failures and liquidations. There are some inherent perceptions that management may not have made sound financial decisions regarding their capital structure.

However, most companies have found it difficult to determine an optimal capital mix. The Nigeria banking sector is one of the engines of the Nigerian economy, but due to financial constraints, many banks have failed in recent years. This is because most banks with a healthy balance of equity and debt perform very well. The capital structure combination is a major factor that contributes to the profitability of publicly traded banks around the world, particularly in Nigeria, because the bank has the option of debt or equity financing. The question of what is the best ratio has been debated for several years but remains unresolved in the field of corporate finance (Nwankwo, 2014).

Regrettably, most investors continue to make poor investment decisions due to a lack of understanding of the trend of capital structure in most publicly listed banks. The purpose of this study is to address some of the technical details needed to understand the capital structure of Nigerian listed banks. Because the selection of Deposit Money Banks is a significant financing decision, deciding on the financing mix in financing assets and operations through debt and equity balancing is also a significant financing decision.

Various studies on capital structure and financial performance of companies have been conducted, but the majority of them have focused on short-term debt, total debt to total assets, and long-term debt, ignoring the other type of financing (Babalola, 2012; Sebastian & Rapuluchukwu, 2012; Idode, et al., 2014). As a result, this study will fill a gap by examining equity ratio, debt ratio, debt-equity ratio, leverage ratio, and interest cover ratio as proxies of capital structure on the profit performance of deposit money banks in Nigeria proxy return on assets.

1.3 Objective of the Study

The primary goal of this research is to investigate the effect of capital structure on the profit performance of Nigeria's top five publicly listed banks. While the specific goal is to:

- i. ascertain the effect of equity ratio on return on assets of quoted banks in Nigeria;
- ii. determine the effect of debt ratio on return on assets of quoted banks in Nigeria;
- iii. investigate the effect of debt-Equity ratio on return on assets of quoted banks in Nigeria;
- iv. assess the effect of leverage ratio on return on assets of quoted banks in Nigeria and
- v. examine the effect of interest cover ratio on return on assets of quoted banks in Nigeria

1.5 Statement of Hypotheses

The null hypotheses to be used as tools for this research are as follows:

H₀₁: Equity ratio has no significant effect on return on assets of quoted banks in Nigeria.

H₀₂: Debt ratio has no significant effect on return on assets of quoted banks in Nigeria.

H₀₃: Debt-Equity ratio has no significant effect on return on assets of quoted banks in Nigeria.

H₀₄: Leverage ratio has not significantly influence return on assets of quoted banks in Nigeria.

H₀₅: Interest cover ratio has no significant effect on return on assets of quoted banks in Nigeria

2.1 Conceptual Review

2.1.1 Capital structure

This capital can come from two different sources. These sources are both internal and external. The term "internal source" describes funds obtained within an organization, which are typically retained earnings (Bariweni, 2019). Companies may also look outside for the funds they need to expand their operations which is referred to as external financing. External funding can be acquired by increasing the number of co-owners in a company or by outright lending in the form of a loan, whether long or short term, or through both. The external source provides a company with three options for funding their investment opportunities: 100 percentage equity, 100 percentage debts, or the combination of debt and equity (Olayemi & Fakayode, 2021).

The concern of capital structure has been recognized as a crucial factor in the success or failure of a company. Companies in Nigeria must be able to fund their operations and expansion over time if they are to remain and perform an increasing and dominant role in creating value-added, providing employment as well as income in the form of profits, dividends, and wages to households, increasing the size of the economy's direct productive sector, generating tax revenue for the government, and facilitating poverty reduction through fiscal transfers and income from employment. Understanding how companies in Nigeria raise capital their operations and generate income for investors is critical in this regard (Duru, et al., 2017).

Capital structure is a term used to describe the commensurate relationship between debt and equity in the finances of corporate entities. It also includes the use of external (debt and equity) and internal (retained earnings) funding (Duenya & Dugugh, 2018). Debt refers to company borrowed funds made through the issuing of bonds and debentures, whereas equity refers to the issue of shares to the public at large to raise money. The debt-equity combination in corporate finance is referred to as capital structure. It is frequently used in banking and finance to demonstrate the equitable relationship between debt and equity (Eniola et al., 2017). In this perspective, capital structure describes the percentage of equity and long-term debt in a company's capital. The equity owners however, have complete control over the company because they bear the greater share of the risk.

According to Dare and Sola (2010), a company's capital structure can be classified into one of three categories: 100% equity: 0% debt; 0% equity: 100% debt; and X% equity: Y% debt. Option one, of the aforementioned alternative solutions, is commonly used by businesses that avoid the advantage of leverage (debt), if any. Businesses with no equity typically prefer the second choice; regrettably, in a real-world economic situation, this alternative choice may not be feasible because no financing provider may be prepared to invest funds in a firm with no common equity. This partly defines the concept "trading on equity," which refers to the equity portion of the investor's capital structure that persuades debt providers to contribute their limited funds to the company. The third option, which the author advocates for, represents the most realistic since it pools a specific percentage of equity and debt in capital structures, thereby maximizing the benefits of leverage, if any. The appraisal, strength of character, and accounting of this mix of equity and debt has long been a point of contention in financial reporting.

2.1.2 Equity ratio (ER)

This refers to funds invested by shareholders of the firm. The term equity refers to the capital investments; funds that was initially invested into the company in return for company shares (Chigbo, 2017). Equity funding is the method of raising capital by selling a company's shares. The equity ratio calculates how much of a company's assets were funded by shareholders. It demonstrates how much of the total company resources are owned outright by investment firms. In other words, this represents the company's stake in the investors. It is calculated by dividing the company's total equity by its total assets.

The above-described owners' equity ratio shows the percentage of a company's assets that have been funded by issuing new equity rather than borrowing funds. The more assets a company has funded with equity rather than debt, the closer its ratio result is to 100%. The ratio indicates how financially secure a business will be in the long run. A low equity ratio suggests that the company acquired assets primarily through debt, which is widely regarded as a higher financial risk.

2.1.3 Debt ratio (DE)

Debt is defined as a company's borrowed funds, which are divided into short and long term debts and also form part of the company's capital structure (Chigbo, 2017). Whenever an organization raises funds for working capital or capital disbursements by selling corporate bonds, trade bills, or notes to individuals and/or investment firms, this is referred to as debt financing. The debt ratios indicate how much of a company's assets are funded by debt. It is calculated by dividing total debt or liabilities by total assets.

By my interpretation, debt ratio evaluation is an affirmation of the connection between a bank's total debt and assets, and it is an indicator of a firm's capacity to repay its debt. It shows the percentage of a company's financing asset that is derived from debt, making it a useful tool for determining a company's long-term financial stability. A secured debt ratio is usually between 1 and 1.5.

2.1.4 Debt-Equity ratio (DER)

A bank's business leverage is measured using the debt-to-equity (D/E) ratio. The D/E ratio is a performance indicator in financial analysis. It is an indicator of how much a company borrows to fund its activities instead of relying on its own funds. A debt-to-equity ratio is a specific type of gearing ratio. The debt to equity ratio displays the proportion of debt an organization uses to finance its benefits in relation to the measure of substantial value mentioned in equity holders' value (Duenya & Dugugh, 2018).

It is calculated by dividing total debt by shareholders' equity. It also establishes that a greater D/E ratio indicates that a bank's funds are primarily derived from debt rather than the issuance of equity capital. Banks have higher D/E ratios because they borrow money to lend to their customers. They also have significant fixed assets, such as branch offices.

2.1.5 Leverage ratio

Leverage is refers to the proportion of debt to equity in the capital structure of a company. It refers to the extent with which a company uses both their equity and borrowings to increase their performance. The financing decision is purely a managerial decision in that it influences the shareholder's return, risk and market value (Nwanna & Ivie, 2017). Companies that borrowed a huge and large sum of money could be seen as highly leverage if this occurred during the business recession and this might pose a great potential risk. Leverage can also refer to the amount of debt used to finance assets (Struesson & Kallum, 2017).

A high operating leverage means that a firm is making few sales but with high margins. This can pose significant risks if a firm incorrectly forecasts future sales. The leverage ratio measures how much debt a bank has in relation to its capital, specifically "Tier 1 capital," which includes common stock, retained earnings, and certain other assets. A higher leverage ratio is considered safer for a bank, just as it is for any other company. A 'leverage ratio' is a group of ratios that highlight a company's financial leverage in terms of assets, liabilities, and equity. They show how much of an organization's capital is borrowed, which is a good indicator of whether a company can meet its financial obligations.

2.1.6 Interest cover ratio

The interest coverage ratio, also known as the "times interest earned" ratio, measures a company's ability to pay interest on its outstanding debt. Essentially, the ratio determines how many times a company's current interest payments can be covered by its available earnings. Divide earnings before interest and taxes (EBIT) by the total amount of interest expense on all of the company's outstanding debts to calculate the interest coverage ratio. The interest coverage ratio measures a company's ability to handle its outstanding debt (Maverick, 2023). Interest Cover Ratio (ICR) or Coverage Ratio (CR), is a measure of financial leverage which indicates the capacity of a

firm to meet fixed financial charges. This ratio recognizes the fact that some organizations in Nigeria make use of assets on a lease contract and incur long-term payment of premium. Investors usually have an idea of the financial risk of a firm by comparing the interest coverage ratios with the acceptable industry standard. The higher the ICR is, the better the ability of the firm to service interest obligations on debt (Bonazzi & Mattia, 2014).

It is one of a number of debt ratios that can be used to evaluate a company's financial condition. A good interest coverage ratio is considered important by both market analysts and investors, since a company cannot grow—and may not even be able to survive—unless it can pay the interest on its existing obligations to creditors.

2.1.7 Profit Performance

The main motivation that shareholders put their hard-earned money to work is to receive a reasonable return while also ensuring the stability of their invested capital. Profit is therefore defined as a company's capability to generate earnings. It is disappointing to observe that many organizations' profit targets have recently suffered a decline, which is attributed to the consequences of the 2008 global recession (Hirindu and Kushani, 2017), a setback that has persisted to the present day. Investment analysts, on the contrary hand, utilise company annual financial ratios to evaluate profitability. Olaniyi and Obembe (2018) defined profitability as the company's capacity to generate profit or gain out of its transactions; it is one of the major elements used in assessing an entity's profit performance. Profit performance illustrates resource efficiency and the capabilities to profit. It is an important piece of information for stakeholders to comprehend (depositors, creditors, shareholders, state, and managers). It shows depositors the revenue and profits generated by their cash deposits. It demonstrates the bank's willingness to fulfill its obligations to creditors. It suggests the bank's means to pay taxes to the state. It represents the return on investment for shareholders. It shows that the value of managers' efforts and human overall investment (Aymen, 2018).

Profitability is the outcome of a number policy and effective decision-making (Brigham & Gapenski, 2016). Its assessment is the most impressive predictor of company's success (Khan, Sajid, et al 2016). It demonstrates how efficiently a company can profit by utilizing all existing market resources. In line with the preceding, Banerjee and De (2014) asserted that profitability is critical to the survival of a privately owned company.

2.1.8 Return on assets (ROA)

Return on Assets or Investment is a critical indicator of a bank's profitability. It is the estimated increase in cash flows generated by the operating cycle as a result of asset or investment expenditures. Anarfo and Appiahene (2017) define return on assets (ROA) as the amount of profit generated by each asset. When making financing decisions, one of the manager's top priorities is to ensure that the firm uses a healthy financing mix or capital structure at all times.

From this standpoint, ROA measured the ability of bank management to generate profit. ROA refers to the traditional financial indicators or accounting ratios used by businesses to determine profitability. It demonstrates how effective management is at generating earnings from its assets. It is the return on investment foregoing immediate spending, calculated as profit after tax divided by total asset.

Theoretical Review: Pecking Order Theory

Myers (1977) proposed the pecking order theory, which holds that there is no optimal capital structure and that every business has a favored pecking order for financing decisions and normally chooses internal financing over raising capital from outside the organization. When all in-house finances are exhausted, moreover, outside funding is necessary. In such a case, companies will favor debt rather than equity, as espoused by Ishaya and Abduljeleel (2014). The pecking order theory is concerned with the signaling effect of debt funding.

According to Chaplinsky and Niehaus (2013), when a company is seeking ways to funding its long-term investment opportunities, it has an established preference for the sources of capital it utilizes. It asserts that a company's first preferred option should be to utilize internal finance (i.e. retain earnings), preceded by debt, and afterwards external equity (Huang and Song, 2015). It contends that the more profitable a company becomes, the less it borrows due to its adequate internal sources of finance to fund its investments. He continues by suggesting that when internal funding is insufficient, a company should seek external funds, preferably through bank loans or corporate bonds. And, once internal and bank borrowed money, as well as corporate bonds, have been exhausted, the final and least considered source of funding is the issuance of new equity capital.

Based on the pecking order theory, companies opt to finance their activities with internally generated funds because using such finances does not send any negative signal that could lower the company's stock price. If external funds are required, companies opt to issue debt before recognizing equity. This is due to the fact that issuing debt is less likely to send a negative signal to investors. If a company issues stock, it sends a negative signal to investors that the company's stock prices are overpriced, which is why the management teams are issuing stock.

This will cause investors to dispose of their shares, causing the company's equity price to fall. A share issue is indeed interpreted negatively by the market, whereas debt is less likely to be interpreted negatively. If internal financing is inadequate, companies opt to issue debt rather than equity. As a result, the pecking order theory is a competing capital structure theory that states companies should consider internally generated funds.

Empirical review

Chukwu et al. (2022) verified the relationship between capital structure (CS) and corporate financial performance (CFP) of Nigerian Stock Exchange-listed deposit money banks (DMBs). The study employed an ex post facto research design and data from thirteen (13) DMBs from 2010 to 2018, with data analyzed using multiple regression. The findings revealed a negative and insignificant relationship between the debt ratio and the return on assets (ROA), a negative and insignificant relationship between the debt ratio and the net profit margin (NPM), and a positive and significant relationship between the equity ratio and the ROA.

Bello et al., (2020) examined the impact of capital structure on the financial performance of Nigerian deposit money banks from 2009 to 2018. Ex-post facto research was used in this study. The collected data was analyzed using descriptive and inferential statistics. The analysis reveals that the ratios of short-term debt to total assets (STDTA) and total debt to total assets (TDTA) have a significant positive impact on ROA. Long term debt to total asset (LTDTA) has a negligible positive impact on ROA. This implies that stakeholders in Nigerian deposit money banks should use a larger portion of their capital structure for short-term debts, and that the method of utilizing resources while expanding the banks, as well as the amount of investment in fixed assets to the ratio of short-term debt, should be carefully considered.

Anetoh, et al., (2021) work explored the relationship between financial leverage and financial performance of beverage manufacturing companies in Nigeria. Multiple regression analysis was used. The findings revealed that there is a strong positive correlation between performance and long-term debt to total asset. The study concludes that financial leverage has a strong connection with the performance of beverage companies in Nigeria.

Alao and Sanyaolu (2020) examined the effect of leverage on the profitability of Nigerian manufacturing firms based on the data of seventeen (17) Nigerian consumer goods firms listed on the Nigerian Stock Exchange for the period of 2012 to 2017. The study adopted the dynamic panel model. The main finding of the study revealed that leverage has a significant positive effect on profitability.

Adeoye and Olojede (2019) conducted a study on the effect of capital structure on the financial performance of quoted deposit money banks in Nigeria over a seven-year period (2012-2018) using audited financial statements from ten (10) banks listed on the floor of the stock exchange. Multiple linear regressions, descriptive statistics, and Pearson moment correlation were used. According to the correlation results, capital structure is negatively correlated with financial performance. Panel regression results revealed that debt to equity, had a negative impact on return on assets and return on equity, asset tangibility had a significant impact on return on asset but had an insignificant impact on return on shareholder's equity, and age had a significant impact on return on asset but had an insignificant impact on return on equity.

Serwadda (2019) carried out another study on the effects of capital structure on bank performance in Ugandan banks over a ten-year period, 2006-2015. The effects of capital structure on bank performance are studied using panel regression models. The findings indicate a positive relationship between capital structure variables and bank performance. It is the difference between long-term debt and total debt with a net interest margin. Total debt and return on assets also have a positive relationship. The relationship between total debt and returns on equity remains unchanged. Short-term debt, on the other hand, has a negative relationship with return on assets.

Afolabi, et al (2019) examined the relationship between leverage and financial performance of Nigerian firms between the years 2007 and 2016. The study adopted ex-post facto research design. The Random Effects Generalised Least Squares (REGLS) revealed Interest Cover Ratio (ICR) has a positive but insignificant effect on ROCE. Also, there is a positive and significant effect between leverage (Debt Ratio; Debt-Equity Ratio) and ROCE.

Nwude and Anyalechi (2018) demonstrated research on the impact of capital structure on the performance of Nigerian commercial banks. The study looked at the impact of borrowed funds on commercial bank performance as well as the causal relationship between debt-equity ratios. Correlation analysis, ordinary least squares regression analysis, fixed effect panel analysis, random effect panel analysis, granger causality analysis, and post estimation tests such as restricted f-test of heterogeneity and Hausman test were used to analyse the data collected. While debt finance has a negative and significant impact on return on asset, the debt-equity ratio has a positive and significant impact on return on equity.

Hafiz, et al., (2018) explored the capital structure and performance of Nigerian deposit money banks. For the period 2007-2016, the convenience sampling technique was used to determine the sample size of 12 banks. The data is analysed using a panel design based on random effect estimation in this study. The study discovered a positive relationship between Net Interest Margin and financial performance (NIM). This implies that more incentives should be provided to suppliers of short-term debt (STD) in order to effectively adjust the maturity structure of STDs. Similarly, debt must be used with caution in order to reap the benefits of its tax shelter and managerial efficiency.

Duenya and Dugugh (2018) used the PP Fisher Chi Square and PP Choi Statistics Test to examine the effect of capital structure on financial performance of selected deposit money banks in Nigeria from 2013 to 2017. In addition, fixed effect regression analysis was used. Five (5) banks were chosen at random. The findings show that the capital structure variables (equity ratio, debt ratio, and debt to equity ratio) had a mixed effect on the performance (ROA) of Nigerian deposit money banks (DMBs). However, the component of DER has provided more evidence of positively affecting performance than the other capital structure components. This implies that

management of financial service companies must play a significant role in determining the best capital mix of debt and equity to maximise profit and improve DMB performance.

Ogiriki, et al., (2018) examined financial leverage and its effect on corporate performance of firms in Nigeria, for the period (1999-2016). Secondary data were used. Hypotheses were formulated and tested using Ordinary Least Square (OLS) econometrics technique. The study revealed that return on asset had a positive significant effect on long-term debt of firms in Nigeria. Return on equity had a positive significant effect on long-term debt of firms in Nigeria. The study also concluded that financial leverage has a significant influence on corporate performance of firms in Nigeria.

Eriki and Osagie (2017) investigated the effect of debt-equity mix on financial performance of Nigerian downstream oil and petrol firms from 2011 to 2015. The hausman test and panel regression analysis with a fixed effect model were used. The findings show that debt to capital employed (DC) and long term debt to common equity (LDCE) have a negative and insignificant impact on firm performance as measured by RoA and RoE, whereas debt to asset (DA) and debt to common equity (DCE) have a positive and significant impact on RoA and RoE. This means that managers of oil and petrol companies must exercise caution when determining the appropriate mix of equity and debt to improve the firm's performance.

In another Abdulrashid, et al., (2017) conducted a study on the effect of capital structure on the performance of DMBs. Four banks were selected as sample and data from their financial statements for a period of 10 years (2006-2015) was used. The study employed Pearson correlation coefficient and GLS regression model for analysis. The result of the study showed that there is a positive relationship between ROE and DER. However, ROA and ROCE have a negative relationship with DER. The study concluded that capital structure has a significant effect on the financial performance of DMBs in Nigeria. In order to maximize return on investment and achieve an optimal capital structure, management of DMBs in Nigeria must employ an appropriate mix of debt and equity capital.

Methodology

Ex-post facto was adopted for the study. The population of study is 13 deposit money banks in Nigeria. Secondary data collected from the financial statement of top five banks which were judgmentally selected. Descriptive and inferential statistics were adopted in the study. The model for the research is presented thus: Mathematical relationship is:

$$ROA = f (EQR + DTR + DER + LER + ICR)$$

To make it estimable the econometric relationship is presented as follows:

$$ROA = b_0 + b_1EQR + b_2DTR + b_3DER + b_4LER + b_5ICR + U_{it}$$

Where:

ROA = Return on Asset

EQR = Equity Ratio

DTR = Debt Ratio

DER = Debt/Equity Ratio

LER = Leverage ratio and

ICR = Interest cover ratio

b₀ = Regression Constant

b₁, b₂, b₃, b₄ & b₅ = Regression coefficients

U_{it} = Stochastic term

Data Analysis

This section of the analysis provides an overview on the data set while attempt is made to describe the main attributes of the data.

Table 1: Shows the descriptive statistics of the variables under study

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	100	12.14082	17.95251	-1.36008	74.29831
EQR	100	.1882615	.2404058	.031171	.996472
DTR	100	.764785	.251179	.004	.92657
LER	100	.2335508	.2527585	.067287	.996
DER	100	8.489899	5.591234	.004015	29.48009
ICR	100	314.0421	1909.834	0	17135

Source, Authors computation 2024 using STAT15
 Table 5 above shows summary statistics under of all the variables study in their raw form have been shown. Particularly, the mean values of the return on assets (ROA), equity ratio (EQR), debt ratio (DTR), debt-equity ratio (DER), Leverage ratio (LER) and Interest cover ratio (ICR) stood at about ₦12.14082m, ₦0.188261m, ₦0.764785m, ₦8.489899m, ₦0.233551m and 314.0421m, showing the 20 years of Zenith Bank, Guaranty Trust Bank, First Bank of Nigeria, Eco Bank Nigeria, and Access Bank covering 2003 to 2022 under study average value. Equally, it shows their various minimum and maximum values as well as their changes over the years. The sum of squares dev. above is a measure of deviation from the mean. Illustrating the spread in the data series was the standard deviation value, 17.95251, 0.240406, 0.252759 and 1909.834 for ROA, EQR, LER and ICR respectively were more than their mean indicating positive skew while 0.251179 and 5.591234 for DTR and DER respectively were less than their mean indicating negative skew.

Table 2: Correlation matrix

| ROA EQR DTR LER DER ICR

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ROA | 1.0000
EQR | -0.2518 1.0000
DTR | 0.1919 -0.9285 1.0000
LER | -0.1863 0.9293 -0.9995 1.0000
DER | 0.2139 -0.6264 0.6321 -0.6345 1.0000
ICR | -0.1102 0.4145 -0.4359 0.4337 -0.2115 1.0000
    
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Source, Authours' computation 2024 using STAT15

Table 2 shows the relationship among the dependent variables and the dependent variables as well as the interaction of the independent variables among themselves. EQR,LEV and ICR ratios exhibits negative association with the dependent variable ROA with their correlation coefficient of -0.2518,-0.1863 and -0.1102 respectively. This means that an increase in those independent variable will result in the reduction in the value of the dependent variables thus they move in opposite direction. DTR and DER has positive relationship with ROA

with their correlation coefficient of 0.1919 and 0.2139 respectively. Therefore, as the increase, the dependent variable (ROA) will also increase, thus they move in the same direction.

Similarly, DTR and DER has negative relationship with EQR whereas LEV and ICR has positive relationship with ROA with their correlation coefficient of -0.9285, -0.6264, 0.9293 and 0.4145 respectively. LEV and ICR has negative correlation with DTR while DER have positive correlation with DTR have correlation coefficient of -0.9995, -0.4359 and 0,6321 respectively. Furthermore, while DER negatively correlate with LEV with correlation coefficient of -0.6345, ICR has positive correlation with coefficient of 0.4337. Finally, ICR has negative association with DER with correlation coefficient of -0.2115.

The rule is that if any of the coefficient is more than 0.8, it suggests presence of autocorrelation. Form the above table one can infer presence of auto correlation in the model.

Test for Normality

The rule is that the data is symmetrically (normally) distributed with p-value higher than 0.05 or asymmetrically (abnormally) distributed with p-value less than or equal to 0.05 around the mean. The null hypothesis is that the data is normally distributed thus the null hypothesis is rejected when the result is significant (i.e less than or equal to 0.05).

Table 3 Shapiro Wilk test for Normality

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
ROA	100	0.73079	22.227	6.880	0.00000
EQR	100	0.53417	38.461	8.096	0.00000
DTR	100	0.55044	37.118	8.017	0.00000
LER	100	0.55342	36.872	8.003	0.00000
DER	100	0.93498	5.368	3.728	0.00010
ICR	100	0.15467	69.794	9.418	0.00000

Source, Authours' computation 2024 using STAT15

From the above, all the variables are abnormally distributed as their p-values are 0.00 which are less than 0.05.

Multicollinearity Test

A rule of thumb to detect multicollinearity is that when the variance inflation factors (VIF) is greater than 10, then there is a problem of multicollinearity.

Table 4: VIF test for Multicollinearity

Variable	VIF	1/VIF
LER	1031.26	0.000970
DTR	1019.84	0.000981
EQR	7.47	0.133887
DER	1.73	0.578660
ICR	1.25	0.798190
Mean VIF	412.31	

Chi2 (1) = 19.52. Prob. > chi 2 = 0.0000

Source, Authours' computation 2024 using STAT15

From the results of test for multicollinearity it shows that the centered variance inflation factors (VIF) for EQR, DER and ICR are less than 10, this implies that there is no presence of multicollinearity in the model while DTR and LER indicate there are presences of multicollinearity since the VIF are more than ten.

4.2.4 Heteroscedasticity Test

Null hypothesis: There is no Heteroscedasticity

Alternative hypothesis: There is Heteroscedasticity

Table 5: Breuch-Pagan/cook-weisberg test for hetreoskedasticity

Type of test	Chi2	P-Chi2
BP/cook-W	19.52	0.0000

Source, Authours' computation 2024 using STAT15

Decision rule If the p-value that corresponds to this chi-square test statistic with p (the number of predictors) degrees of freedom is less than some significance level (i.e. $\alpha = 0.05$) then reject the null hypothesis and conclude that heteroscedasticity is present.

The result above shows that the prob. chi-square $0.000 < 0.05$ level of significance. It implies that the null hypothesis is rejected and alternative hypothesis is accepted. This means that there is presence of Heteroscedasticity in the data.

Breusch and Pagan Lagrangian Multiplier Test for Random Effect

.Since the model indicate presence of heteroskedasticity and multicolliearity, one has to confirm the choice of random effect model or pooled Ordinary Least Square (pooled OLS) using Bruch and Pagan Lagrangian Multiplier test for random effect.

The decision rule is if the calculated value of the test exceeds the critical value (p-value less than 0.05), the null hypothesis is rejected and the random effect model of panel data is chosen and vice versa.

Table 7 Breusch and Pagan Lagrangian multiplier test result

Type of test	Chi2	P-Chi2
BPLMT	0.00	1.0000

Source, Authours' computation 2024 using STAT15

Since the p-value is greater than 0.05, then the null hypothesis is accepted, thus the appropriate estimation techniques still remains the pooled OLS

Pooled OLS Result and discussion

Table 8: Pooled OLS Regression Result

ROA	Coef.	Std.Err.	t	P>[t]	[95% conf.	Interva
EQR	-40.89742	19.66046	-2.08	0.040	-79.93102	-1.8584
DTR	438.8852	219.8824	2.00	0.049	2.303518	875.46
LER	466.2766	219.7282	2.12	0.036	30.00075	902.55
DER	.4824387	.4066191	1.19	0.238	-.324913	1.2897
ICR	-.000204	.0010136	-0.20	0.841	-.0022165	.00180
_cons	-428.7441	219.5668	-1.95	0.054	-864.6992	7.2109

F(5, 94) = 2. Prob > f = 0.02. R-Squared = 0.12. Adj R-Squared = 0.08

Source: Authours' computation 2024 using STAT15

Result on table 8 indicate f statistics of 2 with probability value of 0.02 thus it is significant indicating that the joint impact of the variables are good. R-square value is 0.12 while the adjusted R-square value is 0.08. This indicates a weak model. On the interaction of the explanatory variables with the dependent variables, EQR exert a negative but non-significant effect on the ROA of the banks of study. With regression coefficient of -40.89 and p-value of -1.8584. This implies that as EQR increases, the ROA decreases thus they move in opposite direction. Based on the above, the null hypothesis of no significant effect of EQR on ROA is accepted. However, ICR exert negative and significant effect on ROA of the banks with correlation coefficient of -.000204 and p-value of .00180 which is less than 0.05. To that effect the alternative hypothesis which states that ICR has significant effect on ROA is accepted. This implies that a unit increase in ICR would bring about -.0002 reduction in the ROA of the banks. Similar result was obtained in the work of Afolabi et.al. Who found a positive but non-significant effect of ICR on financial performance of the firms? Furthermore, DTR, LEV and DER all have positive but non-significant effect on ROA of the banks Thus, as the bank increases the use of these element to finance its operations, the return assets would increase even though very minimal. . It also suggests that there is still room for debt financing in the banks for the period understudy. Similar finding of positive relationship between DTR were made by Serwadda, (2019) and Nwude and Anyalechi (2018). However, Adeoye and Olojede (2019) in their work revealed negative and significant effect of DTR on financial performance. For leverage, similar finding were made by Anetoh et al., (2021) and Alao and Sanyaolu (2020) whose work indicates a positive and significant effect of leverage on financial performance.

For DER which showed a positive but non-significant effect on ROA, similar finding was made by Bello et al., (2020) while chukwu et al., (2022) in their work found a negative significant effect of DER on performance.

Conclusion and Recommendations

From the result of the analysis, the study concludes that capital structure elements have varied effect on ROA of banks of study most of which were non-significant.

The study recommends as follows: the banks should rely mostly on equity financing as the debt financing has negative effect on the financial performance of the firms as EQR, DER and ICR show negative effect of debts on the financial performance of banks. The interest coverage ratio, which shows the rate of income relative to interest adversely affect the firms. Thus, further debt financing would have disastrous consequence on the banks financial performance. Those variables (DTR and LER) which indicated positive effect of debt however showed that they are immaterial.

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