



CAPITAL STRUCTURE AND FINANCIAL PERFORMANCE OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

The role of capital structure decision is critical to the performance of any bank. For any bank to efficiently perform its function of financial intermediation, it must be financially structured. Against this backdrop, the study investigated the impact of capital structure on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria spanning from 2006 to 2019. The study adopted panel data obtained from the annual reports and financial statements of the sampled listed DMBs on the Nigerian Stock Exchange. Descriptive and inferential statistics were used to examine the association between the dependent variable of financial performance proxied by the return on assets and independent variables represented by equity capital and leverage ratios while asset tangibility and liquidity were used as control variables. The results of both system dynamic panel Generalized Methods of Moment (GMM) estimator and Toda and Yamamoto (1995) granger non-causality model showed that equity capital significantly and positively affects return on assets (ROA) while leverage ratio significantly but negatively impacts on return on assets (ROA). There is also, a reverse causality relationship running from return on assets (ROA) to capital structure. Based on this, it is suggested that managements of DMBs should pursue financing policies that reduce reliance on debt finance and increases the use of retained profit as internal equity sources, in order to achieve the optimal level of capital structure for better and sustainable performance.

Keywords: Capital Structure, Equity Capital, Leverage Ratio, Financial Performance, Return on Asset

INTRODUCTION

Banks have been known to galvanise the growth of any economy by sourcing funds from the surplus sector and transferring same to develop the deficit sectors of the economy. The performance of this function of intermediation therefore opens banks to several risks, which include financial risk, credit risk, and liquidity risk among others. In the last few years, there has been an increase in scholarly attention to the financial performance of banks with respect to their capital structure. This is perhaps due to the dynamic and evolving nature of banking operations across the world since the 2007/2008 global financial crisis which ravaged many countries. Like most countries, the Nigerian banking sector has had its fair share of the ravaging effects of the global financial crisis.

The changing nature of global banking services notwithstanding, the performance of Nigerian banks is still being measured by their profitability (Anarfo, 2015). Hence, banks are continually faced with the task of adopting appropriate financing mix that allows the right combination of



equity and debt, which will limit their risk exposure and help them in the realisation of their overall market value and profitability (Olalekan & Adeyinka, 2013). Therefore, the mode of financing a firm is of utmost importance to managers and shareholders as a wrong mix of equity and debt financing could affect the performance and survival of the firm. The capital structure therefore does not only affect the profit maximisation of shareholders but also reduces the likelihood of failures as well as helps the bank to survive economic threats and business spheres (Akhtar, Bano, Bano, Zia & Jameel, 2016).

Extant studies have confirmed the steady decline in the financial performance of most deposit money banks (DMBs) in Nigeria following the banks' consolidation exercise of 2005 (Etale & Ujuju, 2018; Umoru & Osenwegie, 2016). The reforms in the banking sector, initiated to stabilise the financial market through the increase in the banks' minimum capital base, rather than strengthening those banks, came with other challenges on both operational performance and the number of healthy banks in Nigeria (Soludo, 2008). At the heart of most of the challenges faced by Nigerian DMBs is the relationship between their capital structure and profitability. How is it that banks with seemingly attractive financial reports become distressed? What type of relationship actually exists between banks' capital structure and their performance? It is in the light of the foregoing that this study seeks to investigate the link between capital structure and financial performance of listed Deposit Money Banks (DMBs) in Nigeria.

Statement of the Problem

The financial performance of most banks in Nigeria has declined significantly over the last few years (Etale & Ujuju, 2018). According to Umoru and Osemwegie (2016), it has not stopped since the banks' consolidation exercise in 2006. This decline in financial performance was attributed to the worldwide economic crises of 2007/2008 and sub optimal capital structure. During the period, 3 banks out of 24 listed on the stock exchange market declared profits while 8 were at the brink of liquidation due to capital inadequacy, liquidity problem, and risk asset diminution. Even, the capital market activities were reduced by about 70 per cent when most banks had to recapitalise in order to meet the mandatory minimum capital requirement (CBN, 2010). The problem extended further as there were records of bank distress in 2011 when 3 banks were acquired by Assets Management Company of Nigeria (AMCON) while in 2018, the Central Bank of Nigeria (CBN) revoked the operating license of Skye Bank, handed it over to AMCON, and later sold it to Polaris Bank (Business News, 2018).

The relationship between the capital structure and profitability has been a crucial issue as this affects the value of banks (Marandu & Sibindi, 2016). Therefore, the major thrust of this study is to investigate why banks, which financial reports appear rosy, suddenly go bankrupt, distressed and become liquidated. More so, empirical studies in Nigeria over the years have not been able to conclude with any certainty the relationship between capital structure and bank's performance as prior results indicated lack of consensus among the researchers (Osadume & Ibenta, 2018).

According to Berger and Bonaccorsi (2006), there might be the possibility of reversal causality between the capital structure and profitability which might also result in simultaneity bias. Prior



studies in Nigeria also failed to establish a causal relationship between the observed variables while the statistical tools and method adopted were not dynamic and reliable enough to provide evidence of association among the variables of their studies. These constitute the problem and research gaps necessitating this study. Therefore, we raise the following research questions to address the objectives of this study.

Research Questions

As a result of the above research problems, the study attempts providing answers to the following research questions:

- i. To what extent does equity capital ratio impact on the financial performance of listed DMBs in Nigeria?
- ii. What is the impact of leverage ratio on the financial performance of listed DMBs in Nigeria?
- iii. What is the causal relationship between capital structure and the financial performance of listed DMBs in Nigeria?

Objectives of the Study

The main objective of this study is to investigate the impact of capital structure on the financial performance of the listed DMBs in Nigeria spanning from 2006 to 2019. The specific objectives of the study are:

- i. To determine the impact of equity capital ratio on the financial performance of listed DMBs in Nigeria;
- ii. To determine the impact of leverage ratio on the financial performance of listed DMBs in Nigeria; and,
- iii. To investigate the causal relationship between capital structure and the financial performance of listed DMBs in Nigeria.

Research Hypotheses

This study is guided by the following hypotheses:

H₀₁: Equity capital ratio has no significant impact on the financial performance of listed DMBs in Nigeria

H₀₂: Leverage ratio has no significant impact on the financial performance of listed DMBs in Nigeria

H₀₃: There is no significant causal relationship between capital structure and the financial performance of listed DMBs in Nigeria.

Justification for the Study

The current study is significant because it used Generalized Methods of Moment estimation and Toda-Yamamoto granger non-causality test to address the endogeneity problem and show the nature of causal relationship between the capital structure and financial performance variables. The outcomes of this study would be of enormous benefits to many interested parties such as shareholders, banks' management, depositors, regulators, and researchers alike. Specifically, the



results of this study will equip stakeholders with applied knowledge of the potential problems in financing decisions as well as judging from the bottom line of the banks' performance to ascertain whether their investments are fully covered and saved. The outcome of the study will also assist management of banks in their decision-making process to maximise their firms' value and maintain sustainability.

Similarly, the depositors and investors would be able to know whether the bank is solvent, strong as well as safe to enable them have access to their money and returns on investment as at when needed. This study will provide useful information that will assist bank regulators and policy makers to develop appropriate policies and put in place adequate structures to monitor excellent performance and safety of the banking system in Nigeria. Finally, the study will be of importance to the academic finance community as it will serve as knowledge bank and reference point to future researchers in the fields of corporate finance.

Scope of the Study

The study is restricted to the impact of capital structure on the financial performance of Deposit Money Banks listed on the Nigerian Stock Exchange from 2006 to 2019. The period of the study was selected because it covered the post-consolidation periods during which Nigeria witnessed unstable financial system and economic crisis. The variables of the study cover banks' equity capital and leverage ratios as independent variables, control variables were asset tangibility and liquidity while the dependent variable was returns on asset (ROA) representing financial performance.

LITERATURE REVIEW

Conceptual Review

Capital Structure

Capital structure involves financing of assets with the mix of all liability items in a firm's balance sheet and these comprise share issuance, private investment, debt instruments, business debts, leasing contract, tax debt, retirement debt, deferred compensation for executives and employees, product related debt and other liabilities (Sailaja & Madhavi, 2015; Khalaf-Taani, 2013; Eniola, Adewunmi & Akinselure, 2017; Anarfo & Appiahene, 2017). These sources and options of financing are also applicable to banks but the choice of any one is restricted by many factors such as regulations, costs of each financing option, and information asymmetry. According to Akparhuere, Eze and Unah (2015); Njeri and Kagiri (2015); Ghasemi and Ab Razak (2016), capital structure can either be measured as equity to debt, equity to total assets, total debt to total asset, long-term debt to total assets or short-term debt to total assets ratios. This study is interested in equity capital ratio and leverage ratio, both measure the proportion of equity and debt financing options available to finance the banks' investments and loans.

Equity Capital Ratio

Banks capital structure can be expressed in terms of equity capital ratio. It is defined as how a company finances its total assets through the issuance of new share capital (external equity),



reserves and retained earnings (internal equity). According to Modugu (2013), internal equity is the retained earnings of a firm that is put in a reserve account and reinvested back into the firm, whereas, external equity refers to funds obtained through the issue of new shares. Equity capital ratio is measured as equity and shareholders fund divided by total asset (Wang & Ke, 2013; Aktas, Acikalin, Bakin & Celik, 2015; Sha'ban, Girardone & Sarkisyan, 2016). According to Basel III, banks' capital is classified into Tier 1 and Tier 2 capital. The shareholders' funds (Paid-up capital, retained earnings, and reserves) are referred to Tier 1 capital which allows banks to absorb losses on an on-going basis (Michael, Etukafia. AKpadio & Etuk, 2018). However, Tier 2 capital is defined as including undisclosed reserves, revaluation reserves, or hybrid capital instruments (Basel Committee on Banking Supervision, 2011). Under the central bank Basel III, bank's capital ratio is defined as equity capital, retained earnings, and reserves divided by total assets which can either be measured as book value or risk-weighted value (Sha'ban *et al.*, 2016). Book capital ratio is employed because it is less prone to measurement problems whereas, capital ratio measures based on risk-weighted assets are often prone to changes and suffer from various measurement problems (Admati & Hellwig, 2013; Sha'ban *et al.*, 2016),

Leverage (Debt Ratio)

Financial leverage is the ability of a company to earn more on its assets by taking on debts that allows it to invest more in order to expand. It is an important attribute of capital structure alongside equity and retained earnings and it serves as corporate funding strategies in which a higher proportion of funds is raised through borrowing than the stock issue (Abbas, Iqbal & Aziz, 2019). This type of capital structure benefits common stockholders as long as the borrowed funds generate a return greater than the cost of borrowing, although the increased risk can offset the general cost of capital (Stovrag, 2017). According to Aremu *et al.* (2013), leverage is derived from long-term debt divided by equity or total assets. The greater the amount of debt, the greater the financial leverage (Kythreotis, Nouri & Soltani, 2018). It represents a measure of the degree of investment risk and how to determine the extent of the use of borrowed funds. However, the nature of debts in banks is different from other non-financial firms. For non-financial firms, majority of debts are debentures, long-term debts, preference share capital, borrowed funds from money and capital markets whereas, banks' debts comprises small proportion of long-term and short-term debt (borrowed funds from government and financial institutions) and higher proportion of deposit liabilities, which are more of short-term nature (Nguyen & Kayani, 2013).

Bank leverage ratio can be measured by considering debt proportion in the financial structure of the bank's balance sheet. Aremu, Ekpo, Mustapha and Adedoyin (2013) defined bank's leverage in terms of financial leverage as one minus equity Tier 1 capital divided by total assets. This method considered both deposits and non-core liabilities over the total assets of the banks, and shows the ability of banks to earn more on their assets by taking on debt that allows them to invest more in order to expand (Nguyen & Kayani, 2013). Following the studies in Aremu *et al.* (2013) and Sha'ban *et al.* (2016), the study used book leverage measured as $1 - (\text{capital Tier 1} / \text{total assets})$. This measure considers debt proportion in the financial structure of the bank's balance sheet that is used to finance banks' operations. Apart from debt to total assets, leverage can also be measured as the ratio of total debt to total capital, total liabilities, long-term and short-term liabilities to total assets whereby the total capital is defined as the sum of total book debt and equity capital (AL-



Mutairi & Naser, 2015; M'ng, Mahfuzur & Selvam., 2017). According to Fama and French (2001), book leverage is a better reflection of the firm target leverage and is widely used in capital structure literatures. Following the studies in Allen, Nilapornkul and Powell (2013); Aremu, *et al.* (2013); Al-Mutairi and Naser (2015), banks' book leverage is measured as the ratio of total book debt to total assets. This measurement shows the percentage of firm's assets that are financed with the total long-term and short-term debt capital. Naturally, banks would prefer the use of debt funding because it does not result in shareholder dilution of voting right, and that the interests paid on debts are tax deductible.

Bank Financial Performance

The most acceptable measure of bank financial performance is profitability (Mohammed, Gewdan & Babela, 2017). It measures the ability of bank management to acquire deposits at a reasonable cost and invest them in profitable investments (Etale & Ujuju (2018). Profitability is the primary goal of banks and it can be measured as profit margin, return on assets, return on equity, operating margin among many other forms and by different elements of financial statements (Akhtar et al., 2016). For the purpose of this study, financial performance is measured by the bank's profitability and proxy as return on assets. The study adopted return on asset (ROA) for bank's financial performance as it takes into account the interest of all stakeholders, while at the same time it indicates management quality and efficiency in managing the assets of the bank. According to Ahmed (2009) and Muraina (2018), return on assets (ROA) is calculated as the ratio of net profit to total assets.

Theoretical Review

The only capital structure theories underpinning the current study are Trade-off and Pecking order theories, and Hypothesis of Reverse causation which better explains the causal link between capital structure variables and the profitability proxy for financial performance as it applicable to banks are discussed thus:

Pecking Order Theory

The Pecking-Order theory was introduced by Donaldson (1961) and developed by Myers & Majluf (1984). According to Swail, Lwiza & Ndanshau (2015), the 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, as applied to banks' capital structure, suggests that using 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.

Trade off Theory

The origin of trade-off theory dates back to a study conducted by Kraus and Litzenberger in 1973 where it was suggested that there exists a trade-off between the benefits of tax saving and the cost of bankruptcy and financial distress in choosing a corporate capital structure. According to Wet (2013), the static trade-off theory suggests that firms that maximise their value choose the appropriate debt and equity ratios by reducing the after-tax cost of debt. Thus, when the bankruptcy cost equals to the tax benefit, the optimal level of capital structure is achieved.

The trade-off theory as applied to banks' capital structure in that the mobilisation of deposit in addition to borrowed funds increase total debt that is committed to short term risk assets. However, more debts increase the financial distress cost which means banks are supposed to pay more interest and face bankruptcy problem if they have more debts than what they can repay. This key and important core operation of banks in deposits taken and credit creation influences banks' profitability and values positively. However, if the deposits are over accumulated compared to the loan amount (credit constraints), the banks could be in difficulties because excess liquidity reduces profitability of bank since liquid assets yields little or no returns but costs on debt continue to be on the high side due to interest payments.

Hypothesis of Reverse Causation

This hypothesis comprises efficiency-risk and franchise-value hypotheses which imply that it is possible for the capital structure to impact on performance rather than performance influencing capital structure. According to Berger and Bonaccorsi (2006), there is a possibility of reverse causality between the capital structure and returns on assets. There may exist endogeneity problems between capital structure and banks' financial performance or there could be a reverse causality relationship between the variables.

Empirical Review

The relationship between bank capital structure and the performance has been examined by many researchers in the past with different results. For instance, Berger and Bonaccorsi (2006) investigated the possibility of a reverse causality between the capital structure and return on assets. In their study, they tested two hypotheses of reverse causation: efficiency-risk and franchise-value hypothesis. Findings of the study showed that the capital structure has significant impact on performance rather than performance influencing capital structure.

Olalekan and Adeyinka (2013) used both primary and secondary data to examine the effect of equity capital ratio on the profitability of DMBs in Nigeria. The results showed that equity capital ratio relates significantly and positively to profitability of banks in Nigeria.

Aymen (2013) employed a static panel data to investigate the relationship between capital and financial performance of 19 sampled banks in Tunisia from 2000 to 2009. The study employed secondary data by using equity capital ratio for the capital structure and return on assets (ROA)



for financial performance. Findings of the study showed that there exists a significant relationship between equity capital ratio and return on assets (ROA).

Marandu and Sibindi (2016) conducted multiple OLS regressions on time series data of big banks in South Africa in the year 2002 to 2013. The study explored the correlation between capital structure and profitability taking cognisance of emerging market of South Africa. The study established a strong relationship between the profitability, represented by return on assets and capital structure. Birru (2016) adopted quantitative approach and used multiple regression models to determine the relationship between capital structure and the financial performance of sampled commercial banks in Ethiopia for a period between 2011 and 2015. Secondary data obtained from financial statements of the banks were analysed. The result showed that capital structure proxied as debt ratio has significantly and negatively associated with the return on assets (ROA).

Akhtar *et al.* (2016) examined the effect of capital structure (debt to equity) on profitability as a measure of performance of banking sector of Pakistan. Secondary data were obtained from the five selected banks covering a period of 11 years (2005-2015) using pooled OLS multiple regression. The result showed that there exists a positive relationship between capital structure and profitability of banks in Pakistan. However, Nguyen and Kayani (2013) in their study found no linear relationship between capital structure and the financial performance of banks whereas Mohammed, *et al.* (2017), found a negative relationship between profitability and leverage in support for pecking order theory. Contrary to this, Abbas *et al.*, (2019) found that bank's capital significantly and positively influenced profitability in Asian developed economies.

Research Gap

The plethora of research on capital structure and the financial performance of banks in developed and developing countries notwithstanding, there is a dearth of empirical studies on Nigerian banks in spite of their roles towards economic growth of the country. This study contributes to existing literature by examining the impact of capital structure on the financial performance of DMBs in Nigeria. Similarly, the results of prior researches were at variance with each other and neither established a causal link between the capital structure and the banks' financial performance variables in Nigeria nor adopted dynamic panel statistical tools and methods. The current study is different because it employed Toda-Yamamoto Granger non-causality estimations in Generalized Methods of Moment (GMM) dynamic panel estimator's framework to address the endogeneity problem and show the nature of causal relationship between the capital structure and financial performance variables.

Finally, previous studies in Nigeria concentrated on measuring banks' capital structure in terms of long-term, short-term and total debt to total assets which results to the problems of variable measurement whereas, this study differs from prior studies by using equity capital ratio measured by capital Tier 1 to total assets and leverage ratio to examine their impact on financial performance measured by returns on assets.

All the aforementioned constitute the main problems of the study and research gaps. Thus, this study attempts to fill the aforementioned research gaps in the literature by contributing to existing



studies as well as make up for the paucity of scholarly papers with up-to-date evidence of the impact of liquidity management on the capital structure of DMBs in Nigeria.

METHODOLOGY

Research Design

This study is quantitative by nature therefore, an *ex-post facto* research design is employed using secondary data obtained from sample DMBs published financial statements.

Population of the Study

The study's population comprises the entire 14 listed Deposit Money Banks on the Nigerian Stock Exchange as at December 2019 (NSE, 2019).

Sample Size and Sampling Techniques

The study used purposive non-probability sampling technique to select 13 out of 14 listed DMBs in Nigeria from 2006 to 2019 so as to provide a reliable and comprehensive result. For consistency, Jaiz bank Plc was excluded due to the fact that it operates non-interest banking business hence, the sample size representing 93% of the entire population of the study includes; Access bank Plc., Ecobank Plc., First bank of Nigeria Plc., First City Monument bank Plc., Fidelity bank Plc., Guaranty Trust bank Plc., Zenith bank Plc., Stanbic IBTC Bank Plc., Sterling bank Plc., Union Bank of Nigeria Plc., United Bank for Africa Plc., Unity Bank Plc., and Wema Bank Plc.

Method of Data Collection

The study employed secondary data which were estimated as annual panel data on the variables which include banks' return on assets, equity capital and leverage ratios, asset tangibility and liquidity. These were obtained from published annual reports and financial statements of the sampled listed DMBs for 2006-2019.

Method of Data Analysis

The method of data analysis used in this study involves both descriptive and inferential statistics with the aids E-views 9.0 software package. In line with studies of Ozili (2017) and Abbas *et al*, (2019), the study examined the degree of association between the variables by employing dynamic panel Generalized Methods of Moment (GMM) estimator initiated by Arellano & Bond (1991) and Toda-Yamamoto (1995) Modified Wald Granger non-causality model. The GMM panel data analysis was used to examine objectives 1 and 2 in models 1 and 2 respectively so as to address the problems of endogeneity and establish if there exist short run relationships among the variables of the study. However, TY MWALD non-causality test was used to analyse the objective 3 in model 3 to determine the direction of the causal relationship between the capital structure and financial performance variables. In addition, diagnostic tests such as unit root and Variance Inflation Factor (VIF) tests were carried out to ascertain the stationarity level, order of integration and collinearity among the variables.

Model Specification

In realising the objectives of this study, both equity capital and leverage ratios were used as independent variables, asset tangibility and liquidity ratio of banks as control variables while the

dependent variable of the study was financial performance measured by return on assets (ROA) of the sampled banks. The model adopted for this study is based on econometric model of multiple regression approach similar to the one used by Abbas *et al.*, (2019). However, the functional relationship among the variables for the regression model was specified in the following forms:

Financial performance = f (Equity, Leverage, Asset tangibility, Liquidity) (3.1)

Econometrically the model with lagged value of dependent variable can be specified explicitly as GMM panel models 1 and 2 thus:

Model 1: $\Delta ROA_{it} = \beta_0 + \beta_1 \Delta ROA_{it-1} + \beta_2 \Delta ECAP_{it} + \beta_3 \Delta ATANG_{it} + \beta_4 \Delta LIQ_{it} + U_{it} \dots$ (3.2)

Model 2: $\Delta ROA_{it} = \beta_0 + \beta_1 \Delta ROA_{it-1} + \beta_2 \Delta BLEV_{it} + \beta_3 \Delta ATANG_{it} + \beta_4 \Delta LIQ_{it} + U_{it} \dots$ (3.3)

However, Toda-Yamamoto Modified Wald Panel non-causality model was used for objective 3 and thus model 3 is specified as follows:

Model3: $ROA_t = \beta_0 + \sum_{i=1}^{k+dmax} \beta_{1i} ROA_{t-i} + \sum_{i=1}^{k+dmax} \beta_{2i} ECAP_{t-1} + \sum_{i=1}^{k+dmax} \beta_{2i} BLEV_{t-1} + \sum_{i=1}^{k+dmax} \beta_{3i} ATANG_{t-1} + \sum_{i=1}^{k+dmax} \beta_{4i} LIQ_{t-1} + U_{it} \dots$ (3.4)

Where:

ROA_{it} = Financial performance for bank i in year t;

$ECAP_{it}$ = Book equity capital ratio for bank i in year t;

$BLEV_{it}$ = Book leverage for bank i in year t;

$ATANG_{it}$ = Asset Tangibility for bank i in year t;

LIQ_{it} = liquidity for bank i in year t;

$ROA_{t-1 it}$ = One year lagged return on asset ratio for bank i in year t;

β_0 is Constant, U_{it} is Standard error; $\beta_1, \beta_2, \beta_3, \beta_4$ are Coefficient of explanatory variables; whereas i and t denote bank and time specific effects. \sum is summation, k is the lag length, dmax is order of integration and (k + dmax) is the order of VAR. U_{it} is Standard error; $\beta_1, \beta_2, \beta_3, \beta_4$ are Coefficient of explanatory variables; whereas i and t denote bank and time specific effects.

Mathematically, a priori expectation can be written in model 1 as: $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0$; and model 2 as: $\beta_1 > 0, \beta_2 < 0, \beta_3 > 0, \beta_4 < 0$;

Variables Definition and Measurement

The dependent variable represented by return on assets (ROA) to measure financial performance, independent variables were equity capital ratio and book leverage while the controlled variables also were represented by asset tangibility and liquidity are described in Table 3.2 as follows:

Table: 3.2 Descriptions of Variables Used, Their Sources and Expected Sign

S/N	Variables	Definition	Measurement	Authors	Sign
Dependent variables					
1	PROF (ROA)	Profitability	$PAT \div \text{Total Asset}$	Muraina (2018)	
Independent Variables					



2	ECAP	Book Equity Capital Ratio	Equity ÷ Total Asset	Sha'ban <i>et al.</i> (2016)	+
3	BLEV	Book Leverage	Total Liabilities ÷ Total Asset	Allen <i>et al.</i> (2013), AL- Mutairi & Naser (2015)	-
Control Variables					
4.	ATANG	Asset Tangibility	Fixed Asset ÷ Total Asset	Nilssen (2014), M'ng <i>et al.</i> (2017)	+
5.	LIQ	Liquidity	Total Loans ÷ Total Deposit	Nilssen (2014), Aragaw (2015)	-

Sources: Authors' Computation (2019)

RESULTS AND DISCUSSION

This section focuses on presentation and interpretation of data analysis. It also dealt with the discussion of the result of hypotheses tested and discussion of results.

Descriptive statistics

The summary statistics of the variables used in this study were shown in Table 4.1; the results indicate the total number of observations, mean and standard deviation, minimum and maximum values of all the variables for a panel of 13 listed Deposit Money Banks in Nigeria for the periods 2006 to 2019. During the entire period, the sampled listed DMBs on average earned a net income of 2.6 per cent of total asset with a maximum and minimum value of 0.448 and -0.091 respectively. The standard deviation is 4.33 per cent from the mean value. This reflects the existence of moderate variation among the sampled listed DMBs. The mean of the equity capital was 0.136. This showed a lower level of 13.6 per cent of equity capital employed by the entire sampled banks with the maximum and minimum value of 0.363 and -1.646 respectively. It deviates by 16.5 per cent from the mean value of the sample of the listed DMBs in Nigeria.

The average value of leverage is 86.4 per cent (mean = 0.864) which is measured by total debt over total asset. This provides evidence that DMBs operate with significant high level of leverage with the minimum value of 0.637 and maximum value of 2.547 respectively. The standard deviation for the total leverage ratio of the sampled banks is 0.164. The book leverage ratio of the sample banks ranges between 0.637 and 2.547 from 2006 to 2019.

Table 4.1 Descriptive Statistics

Variables	Mean	Median	Mini	Max	Std. Dev.	Obs.
ROA	0.0255	0.0190	-0.0910	0.4480	0.0433	182
ECAPS	0.1360	0.1435	-1.5470	0.3630	0.1646	182
BLEV	0.8635	0.8560	0.6370	2.5470	0.1644	182



ATANG	0.0735	0.0375	0.0110	0.6060	0.1174	182
LIQ	0.6286	0.6080	0.1420	3.2290	0.2855	182

Source: Authors' Computation (2019)

Pearson correlation matrix

Tables 4.2a and 4.2b present the correlation analysis among the variables for the two models specified in this study. In model 1, there exists a positive correlation between equity capital, asset tangibility and return on asset of about 23% and 31% respectively. The correlation matrix result shows that the correlation among the two or more explanatory variables is very low. This means that multicollinearity is not a concern in the regressions. This is because the correlation figures among the variables are statistically insignificant and hence there is no multicollinearity problem. Therefore, to understand the impact of explanatory variables (capital ratios) on profitability, we estimate the empirical equation. The results are presented in the Tables 4.2a and 4.2b as follow:

Table 4.2a: Correlation Analysis for Model 1

VARIABLES	ROA	ECAPS	ATANG	LIQ
ROA	1.0000			
ECAPS	0.2345	1.0000		
ATANG	0.3085	0.0092	1.0000	
LIQ	-0.0969	0.1634	-0.0276	1.0000

Source: Authors' Computation (2019)

Table 4.2b: Correlation Analysis for Model 2

VARIABLES	ROA	ECAPS	ATANG	LIQ
ROA	1.0000			
BLEV	-0.2326	1.0000		
ATANG	0.3085	-0.0093	1.0000	
LIQ	-0.0969	-0.1578	-0.0276	1.0000

Source: Authors' Computation (2019)

Diagnostic Tests

Test for Stationarity

The study employed E-views 9.0 package to carry out two panel unit root tests (Levin-Lin-Chu and Hadri Z-stat) in order to determine whether the variables used were stationary or not. In the Levin, Lin and Chu test and Hadri Z - stat, the null hypothesis implies the existence of unit root and the alternative hypothesis suggests the absence of unit root. Table 4.3 showed that all the observed variables have no unit root and were stationary at first difference as they are significant at 5% level. That is, variables used were integrated of order zero (0) and one (1) stochastic process. This confirms that long-run relationship exists among the variables of the study hence; we can rely on the output of this research work.

Table 4.3: Unit Root Test Results

Variables	Levin, Lin & Chu t	Hadri Z – stat	Level	Remarks
PROF	6.3732 (0.0000)	1.6829 (0.0462)	I(0)	Stationary



ECAP	8.2072 (0.0000)	5.1839 (0.0000)	I(0)	Stationary
BLEV	7.5892 (0.0000)	5.5537 (0.0000)	I(0)	Stationary
TANG	-13.2773 (0.0000)	3.2306 (0.0006)	I(1)	Stationary
LIQ	4.3413 (0.0000)	3.2930 (0.0005)	I(0)	Stationary

Source: Authors' Computation (2019).

Lag Length Selection Criteria Results

The VAR Lag Order Selection results in the Table 4.5 revealed that only Schwarz Information Criterion (SC) indicates the optimal lag length of two ($k = 2$) but the majority of lag order selection criteria such as LR, FPE, AIC and HQ reports the optimal lag length of three ($k = 3$) out of a maximum of 4 lag lengths as selected. Therefore, the optimal lag length based on the majority lag order selection criteria is 3.

Table 4.4: Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1224.38	NA	2.70e-15	-19.36	-19.24	-19.31
1	1493.58	512.76	5.60e-17	-23.23	-22.56	-22.96
2	1570.85	141.04	2.45e-17	-24.06	-22.82*	-23.56
3	1628.24	100.21*	1.47e-17*	-24.58*	-22.77	-23.84*
4	1640.85	21.02	1.81e-17	-24.38	-22.02	-23.42

Source: Authors' Computation (2019). Note: () indicates lag order selected by the criteria and each test at 5% level. LR: Sequential modified LR test statistic, FPE: Final predictor error AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion*

Test for Multicollinearity

The study employed Variance Inflation Factor (VIF) to examine multicollinearity which is also referred to actual disparity percentage to total disparity. The results in Table 4.5 shows that VIF tests are below 10 for both model 1 and 2. This means that the value was above the minimum tolerance value (1/VIF) of 0.1 below which multicollinearity is considered to be a problem.

Table 4.5: Variance Inflation Factor (VIF) and Tolerance (TOL) Results

Variables	Variance Inflation Factor (VIF)		Tolerance (1/VIF)	
	Model 1	Model 2	Model 1	Model 2
ECAP	1.028		0.973	
BLEV		1.026		0.975
ATANG	1.001	1.001	0.999	0.999
LIQ	1.029	1.027	0.972	0.974



Mean VIF 1.019 1.018

Source: Authors' Computation (2019)

Regression Results

Table 4.6 showed the results of the Two-Step Generalized Method of Moments (GMM) estimation of models 1 and 2 for testing the null hypotheses 1 and 2 of the study. The third null hypothesis was tested with Toda-Yamamoto Modified Wald Panel non-causality model 3 in Table 4.7.

Hypotheses Testing**H01: Equity capital ratio has no significant impact on the financial performance of listed DMBs in Nigeria.**

The results of the regression estimate of the first hypothesis (H_{01}) tested showed that $ROA = 0.0140ROA_{(-1)} + 0.0797ECAP + 0.3408TANG - 0.0288LIQ$. This result indicates that the coefficient of equity capital ratio is 0.0797 (p-value = 0.0000) and this is statistically significant at 1% level. The result indicates that a per cent increase in equity capital ratio will lead to 8 per cent in return on assets (ROA). This result therefore rejected the null hypothesis and accepted the alternative hypothesis that equity capital ratio has significant and positive impact on the financial performance of DMBs in Nigeria. This result is consistent with trade off theory.

H02: Leverage ratio has no significant impact on the financial performance of listed DMBs in Nigeria

The regression model explains the results of the second hypothesis (H_{02}) which shows that $ROA = 0.0134ROA_{(-1)} - 0.0787BLEV + 0.3413TANG - 0.0286LIQ$. This result revealed a negative coefficient of leverage ratio of -0.0787 (p-value = 0.0000) and this is statistically significant at 1% level. This indicates that a per cent increase in leverage ratio will lead to 8 per cent decrease in return on assets. The result also rejected the null hypothesis (H_0) and accepted alternative hypothesis that leverage ratio has significant negative impact on the financial performance of listed DMBs in Nigeria.

H03: There is no significant causal relationship between capital structure and the financial performance of listed DMBs in Nigeria.

The results of Toda-Yamamoto non-causality MWALD Test revealed that both equity capital ratio (ECAP) and leverage ratios (BLEV) X^2 test statistics of 3.52035 (p = 0.4748) and 2.63336 (p-value = 0.6209) respectively are greater than 5% level of significance. The result further showed that ECAP and BLEV X^2 test statistics are 9.72401 (p-value = 0.0453) and 9.75287 (p-value = 0.0448) respectively are less than 5% level of significance. The results rejected alternative hypothesis and accepted the null hypothesis that there is no significant causal relationship between capital structure and the financial performance but rather, there exists a reverse causality relationship running from financial performance (ROA) to capital structure of listed DMBs in Nigeria during the period of study.

Table 4.6: Two-Step GMM Results for Impact of Capital Structure on ROA**Dependent variable: ROA**

Models	Indep.Variables	Coefficient	Std. Error	t-Stats	P-Value	Remarks
Model 1	ROA(-1)	0.014037	0.014887	0.942935	0.3472	Insig.



Model 2	ECAP	0.079710	0.004416	18.05063	0.0000	Sig.
	ATANG	0.340779	0.123742	2.753953	0.0066	Sig.
	LIQ	-0.028758	0.006285	-4.575427	0.0000	Sig.
	ROA(-1)	0.013406	0.014663	0.914306	0.3620	Insig.
	BLEV	-0.078667	0.004390	-17.92150	0.0000	Sig.
	ATANG	0.341274	0.123385	2.765923	0.0064	Sig.
	LIQ	-0.028572	0.006218	-4.594916	0.0000	Sig.

Source: Authors' Computation (2019)

Table 4.7: Results of Toda-Yamamoto Modified Wald Granger Non Causality Tests
Dependent variable: ROA

Null Hypothesis:	Chi-sq	Df	Prob	Results
ECAP does not Granger Cause ROA	3.52035	4	0.4748	Insig. Accept H_0
ROA does not Granger Cause ECAP	9.72401	4	0.0453	Reject H_0 Causality
BLEV does not Granger Cause ROA	2.63336	4	0.6209	Insig. Accept H_0
ROA does not Granger Cause BLEV	9.75287	4	0.0448	Reject H_0 causality

Source: Authors' Computation (2018)

Discussion of Findings

The summary of statistics shows that the capital structure of the sampled listed DMBs comprises 13.6% equity capital and 86.4% leverage ratio during the entire period of this study. This indicates that DMBs in Nigeria operate with significant high level of leverage and lower level of equity respectively which reaffirmed the fact that banks are highly levered institutions. In addition, the average profitability measured by ROA was 2.6 per cent which implies that the sampled DMBs on average recorded a low performance net return of 2.6 per cent of total asset employed. This showed a relatively low compared to total asset employed by the selected sampled DMBs. Furthermore, the results of correlation analysis show that there were no multicollinearity problems among the variables as correlation coefficient of each explanatory variable of the study is less than 0.8 and this is supported by the result of Variance Inflation Factor mean of 1.018 which is less than 10.

The Dynamic system GMM panel regression result showed that the parameter estimate indicates a positive and significant relationship between equity capital ratio and the performance (ROA) but the null hypothesis (H_{01}) in model 1 was rejected while alternative hypothesis which states that equity capital has significant and negative impact on the financial performance (ROA) was accepted. This result is in tandem with the studies in Olalekan & Adeyinka (2013); Ozili (2017) and Abbas *et al*, (2019). It was also conformed to trade off theory meaning that banks with higher equity capital ratio have ability to finance their asset growth. By this higher profitability is achieved by banks since the cost of capital reduces.



On the other hand, the result of the second hypothesis rejected the null hypothesis (H_{02}) and the alternative hypothesis which states that leverage has a significant and negative impact on the financial performance (ROA) was accepted. This suggests that a profitable bank depends less on debt financing in as much as new investments are financed from retained profit or accumulated reserves. In addition, the negative relationship between leverage capital and return on assets might be as a result of high costs (interest expense) associated with external debts to banks which adversely affect profitability. This finding is consistent with the pecking order theory that suggests that profitable firms prefer internal financing to external debt hence profitability is expected to have negative relation with leverage. This result is also in line with the studies in Birru (2016); Marandu & Sibindi (2016) and Mohammad, *et al.* (2017).

The third hypothesis (H_{03}) was examined through the granger non-causality test and this revealed that both the coefficients of equity capital and leverage ratios were not significant at 5% level. This indicates the rejection of alternative hypothesis while the null hypothesis (H_0) that there is no causality link between capital structure and the financial performance of DMBs in Nigeria is accepted. However, there exists a uni-directional or reverse causality running from ROA to both equity capital and leverage. This is also in tandem with findings in the study of Berger & Bonaccorsi (2006). The result also implies therefore that ROA can be used to forecast or predict capital structure measured by equity capital ratio (ECAP) and leverage ratio (BLEV). This also indicates that profitability (ROA) is an important determinant of capital structure of DMBs in Nigeria during the period of study. This result conforms with pecking order theory that retained profit can be used to predict capital structure of banks in Nigeria.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study was conducted to investigate the impact of capital structure on the financial performance of listed Deposit Money Banks in Nigeria. The study was premised upon trade-off and pecking order theories as well as reverse causality hypothesis. The relevance of these theories showed that banks were able to optimise their return on assets at an optimum capital when there is a trade-off between the costs and benefits of debt and equity financing and that the banks will prefer internal to external sources of finance. That is, the banks found it preferable to use retained profit to debts, and debts over equity financing in order to reduce the costs of operation and maximise their financial performance. The secondary data were obtained from annual audited financial statement of thirteen (13) DMBs quoted on the Nigerian Stock Exchange during the time period 2006-2019. The study employed ex-post facto research design and the sampled data collected were analysed by employing panel data multiple regression analysis model with the aids dynamic GMM estimator and Toda-Yamamoto granger non-causality tests.

The study provides evidence that the capital structure of Deposit Money Banks in Nigeria comprised 14% of equity capital and 86% of debt capital (leverage) and recorded a low net return of 2.6 per cent of total asset employed. This low financial performance recorded might be as a result of the Nigerian banks being highly levered during the period of the study. The study further



concludes that the Nigerian banks' financial performance is significantly and positively influenced by equity capital ratio but negatively influenced by leverage ratio during the period of study. Finally, the study concludes that capital structure does not granger cause financial performance rather, there is a reverse causality relationship running from financial performance (ROA) to both equity capital and leverage ratios meaning that it is only performance that can predict capital structure of Deposit Money Banks in Nigeria during the entire period of this study.

Recommendations

Based on the findings obtained from this study, the following recommendations were made:

- i. Since the equity capital ratio has significant and positive impact on banks' financial performance, banks in Nigeria should develop new strategies to increase internal equity capital by retaining their earnings to build their capital above the minimum capital requirement that is optimal in order to maximise return on assets at a reduced cost.
- ii. In order to avoid the adverse effect of using debt financing such as higher cost of capital and bankruptcy costs as well as low performance, banks' management should seek to finance their business operations and investments internally.
- iii. Since either equity capital or leverage ratios cannot individually and jointly granger cause the financial performance with evidence of reverse causality, the bank should give due consideration to appropriate mix of equity and leverage capital ratios in order to improve the bank's performance as well as achieve optimal capital structure.

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