



Effect of Capital Structure on Financial Performance of Listed Banks in Nigeria

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Authors' contributions

This work was carried out in collaboration between the authors. Both authors read and approved the final manuscript.

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ABSTRACT

Corporate entities all over the world are faced with the problem of determining appropriate finance that will boost the value of the entity and maximize the wealth of shareholders. However, for overall wealth of shareholders to be met and consistent increase in value of Banks to be achievable, capital either debt in form of customers deposit or equity capital raised from investors is inevitable. This study therefore examined the effect of capital structure on the performance of some selected banks in Nigeria. The objectives were to examine the relationship that exists between capital structure and financial performance and to investigate the effect of capital structure on the financial performance of quoted deposit money banks in Nigeria.

To achieve these, a cross sectional time series secondary data covering the period of seven years (2012-2018) was extracted from the audited financial statement of ten (10) banks listed on the floor of stock exchange. The descriptive statistics, Pearson moment correlation and multiple linear regressions were used.

The correlation results showed that capital structure is negatively correlated with financial performance (ROA and ROE). Result from panel regression revealed that debt to equity though significant, impacted negatively on return on assets and return on equity ($\beta = -0.1266, P < .01$; $\beta = -5.3571, P > .01$), asset tangibility significantly impacted return on asset but

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insignificantly impacted return on shareholder's equity ($\beta = -0.0235, P > .05$; $\beta = -0.3527, P > .10$) and also Age have a significant impact on return on asset and insignificant effect on return on equity ($\beta = -0.0141, P < .01$; $\beta = -0.1497, P > .10$).

This study therefore concluded that capital structure have a negative effect on the financial performance of deposit money banks in Nigeria and recommended that appropriate proportion of capital should be tailored towards viable investment opportunities for maximum return of shareholders wealth and increase in value of the firm. More so, while finance manager is alert to the movement in the stock market, banks should take precautionary measures for mitigating credit risk associated with lending and borrowing.

Keywords: Debt to equity; assets tangibility; age of banks; return on equity; return on assets.

1. INTRODUCTION

Globally, corporate entities are faced with the problem of determining appropriate finance that will boost the value of the entity and maximize the wealth of shareholders. The expectation of all shareholders are exclusively on how the overall wealth will be maximized and consistency in achieving this objective can only be guaranteed if the going concern of the bank is not threatened by any constraints as survival is determined by the level at which available capital in form of debt or equity or any other means is sourced and merged where necessary in order to fund its operations for maximum returns. The sudden collapse of some banks in the past is traceable to inability of corporate financial managers to secure the best proportion of capital in carrying out daily operations which engender profitability and continuity in banking system. If none of these financial means brings productive results, then there should be consideration for alternative route. However, the problem facing entities in Nigeria lies within financing either to source equity or debt assets. Considering firm's capital structure is imperative not just to boost earnings but also its effect on organization's capability to manage competitive environments. The aim of a firm's capital structure may not be focused on wealth maximization but to safeguard management's interest mostly in firms where control is dictated by directors and shares of the corporation carefully held [1]. As the main function of banks is to accumulate surplus funds and make them available to deficit sectors of the economy, they make profits through lending and borrowing activities hence, the bigger the size of the bank, the higher the expenditure [2,3]. However, competition in the banking sector has tightened due to technological advancements and major changes in the financial and monetary environment [4]. Therefore, the vacuum of knowing which of the capital to source for and

concentrate on, that will really affect Bank performance positively and to maintain its equilibrium is yet to be filled. The questions borne out of quest to determine the level of impact of capital structure on Bank profitability are: What is the direction of causality between capital structure and performance of quoted banks in Nigeria? Is there any positive and significant effect of Debt ratio on performance of quoted banks in Nigeria? Will age of Banks have positive and significant relationship with performance of quoted banks in Nigeria? And is there any significant relationship between asset tangibility and performance of quoted banks in Nigeria?

1.1 Objectives of the Study

The main objective of the study is to examine the effect of capital structure on financial performance of some selected quoted deposit money banks in Nigeria. The study has following specific objectives:

- i. To determine the direction of causality between capital structure and performance of quoted banks in Nigeria.
- ii. To determine the impact of Debt to equity ratio on the performance of quoted banks in Nigeria.
- iii. To evaluate the extent to which age of firm affect the performance of quoted banks in Nigeria.
- iv. To investigate the effect of asset tangibility on the performance of quoted banks in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual Issues

Traditionally, banks offer loans to customers in deficient of funds by borrowing from the

customers with surplus funds. In other words, banks fulfill the role of financial intermediation between the companies and investors by granting loans and receiving deposits. The intermediary role allows banks to finance their activity with high level of debt and low level of equity. High proportion of deposits in banks' liabilities allows leverage (total liabilities to total assets) of banks to be very high.

2.2.1 Capital Structure

Capital structure is the integration of various sources of funds within or outside the firms' terrain in financing its worthwhile investments and projects with positive net present value. It implies how a firm finances its overall operations and sustains its growth by using different sources of funds. Debt can either be a loan form or in the form of sale of bonds, while equity is classified as common stock, preferred stock or retained earnings. Short-term debt such as working capital requirements is also considered to be part of the capital structure.

Capital structure denotes means a firm funds its operations using some blend of equity plus debt. [5,6] define it as the technique an establishment applies for financing based on a blend of long-term capital (ordinary and preference shares, debentures, loans, loan stock, etc.) in addition to short-term obligations like overdraft and other payables. Also, [7,8] opined that capital structure is the mixture of diverse securities utilized by a company in financing its profitable ventures. What is common to the above definition is that capital structure reflects each component of finance from equity to debt that a company uses in financing its operations.

Capital structure denotes mixture of suitable components of capital either in form of debt or equity to fund organizational long term investment opportunities for maximum returns.

2.2.2 Determinants of capital structure

Among factors that may be instrumental in affecting the capital structure decision of a firm include the followings:

Leverage or Trading on Equity: According to [9], the use of fixed cost in production process also affects the capital structure. The high operating leverage-use of higher proportion of fixed cost in the total costs over a period of time

can magnify the variability in future earnings. Both the bankruptcy cost theory and agency cost theory suggest the negative relation between operating leverage and debt level in capital structure. The bankruptcy cost theory contends the higher operating leverage, the greater the chance of business failure and the greater will be the weight of bankruptcy costs on enterprise financing decisions. Similarly, as the probability of bankruptcy increases, the agency problems related to debt become more aggravating. Thus, these theories suggest that as operating leverage increases, the debt level in capital structure of the enterprises should decrease.

Growth Opportunities: The higher the growth opportunities, the more the need for funds to finance expansion, and the more likely the firm is to retain earnings than pay them as dividends. Firms tend to use internal funding sources to finance investment projects if it had large growth opportunities and large investment projects. Such a firm chooses to cut, or pay fewer dividends, to reduce its dependence on costly external financing. Firms with slow growth and fewer investment opportunities pay higher dividends to prevent managers from over-investing company cash. As such, a dividend here would play an incentive role, by removing resources from the firm and decreasing the agency costs of free cash flows [10].

Dividend Payout: The bankruptcy costs theory pleads for adverse relation between the dividend payout ratio and debt level in capital structure. The low dividend payout ratio means increase in the equity base for debt capital and low probability of going into liquidation. As a result of low probability of bankruptcy, the bankruptcy cost is low. According to the bankruptcy cost theory, the low bankruptcy cost implies the high level of debt in the capital structure. But the pecking order theory shows the positive relation between debt level and dividend payout ratio. According to this theory, management prefers the internal financing to external one. Instead of distributing the high dividend, and meeting the financial need from debt capital, management retains the earnings. Hence, the lower dividend payout ratio means the lower level of debt in capital structure [10].

Size of the Firm: Small size business firms' capital structure generally consists of loans from banks and retained profits. While on the other

hand, big companies having goodwill, stability and an established profit can easily go for issuance of shares and debentures as well as loans and borrowings from financial institutions [10].

Period of Financing: The duration of financing is also another determining factor. When a company wants to raise finance for short period, it goes for loans from banks and other institutions; while for long period it goes for issue of shares and debentures [10].

Degree of Control: The degree of control that ordinary shareholders want to have is another factor that will influence its capital structure. Ordinary shareholders have got maximum voting rights in a concern as compared to the preference shareholders and debenture holders. Preference shareholders have reasonably less voting rights while debenture holders have no voting rights. If the ordinary shareholders want to retain control of the company, they will prefer floating of debentures to raise additional capital to floating of ordinary shares [10].

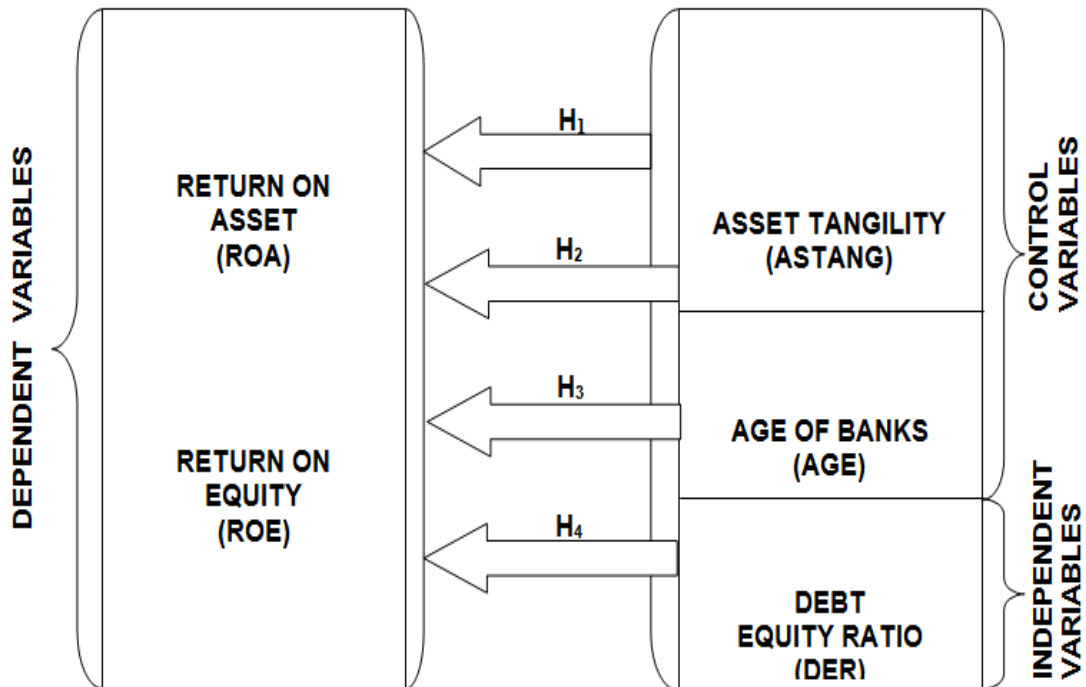
Choice of Investors: The Company's policy generally is to have different categories of

investors for securities. Therefore, a capital structure should give enough choice to all kinds of investors to invest. Bold and adventurous investors generally go for equity shares and while conscious investors prefer a mix of loans and debentures [10].

Capital Market Condition: During economic depression, the company's capital structure generally consists of debentures and loans. While in period of inflation, the company's capital should consist of mainly equity share capital as debt becomes expensive due to high interest rates [10].

Flexibility of Financial Plan: The level of flexibility desired in altering the financial plans of a company will determine how much debt or equity it will hold to allow for contractions as well as relaxation in financial plans as and when necessary. Debentures and loans can be refunded back as the time requires. On the other hand equity capital cannot be refunded at any point which provides rigidity to plans. Therefore, in order to make the capital structure possible, the company should go for issue of debentures and other loans [10].

2.2.3 Conceptual Model



Source: Author's Conceptualization (2019)

2.3 Theoretical Review

In order to place this study on a proper footing, below are various theories of capital structure examined.

2.3.1 Pecking order theory

The pecking order theory is suggested by Myers and Majluf [11]. They stated that when a firm issues new equity, it shall send a signal to investors that share prices are overvalued because it makes managers issue new equity. Then, investors will sell their shares and eventually makes the stock price drop. Thus, firms prefer to use debt rather than equity if they need external financing.

The Pecking order Theory is applicable in the case of banks. Compared to the issuing new equity, increasing deposits are still much easier because it is a function of banks. Moreover, issuing new equity can send a negative signal to the existing investors that the shares are overvalued, and even their voting rights may be diluted. Thus, the investors will value the issuing of new equity less than using deposits.

2.3.2 Trade-off theory

The second proposition by Modigliani and Miller [12] introduces the trade-off theory. This theory of capital structure gives an assumption that the management of a company will always choose how much debt and equity to use in financing the operations of the entity and that this is obtained by balancing off the cost and benefits associated with each source of finance. According to the theory, firms should select an optimum capital structure that balances the benefits and risks of both debt and equity.

Trade-off Theory of Capital Structure suggests that when the banks have more deposits, they can use that amount to lend more to make the profit because lending is the most important operation of banks. Thus, it may increase the profitability. However, if the over accumulations of deposits are compared to the loan amount (credit constraints), the banks can face some difficulties because of the liquidity risk: the deposits will mature, and it cost the banks more to repay the deposits to customers. Thus, in general, there is a trade-off of using deposits.

2.3.3 Agency cost theory

Jensen and Meckling [13] stated that managers and shareholders sometimes don't share the same interests. This idea would cause the principal- agent problems. Debt financing is used as a method to reduce the conflict between them which decreases the agency cost. When a firm starts borrowing from banks, managers have to comply with the debt discipline which can increase the transparency and sustainability which somehow align their goals with the shareholders. Thus, shareholders can use debt as a method to control managerial behavior (Boothoo, 2009).

When a firm starts to use borrowings, they have to comply with lender's regulation. Thus, they have to increase their transparency to meet the requirements which may reduce the principal-agent problem. However, this mechanism is more complicated for banks. The bank must maintain its good reputation for safety to attract more customers. Thus, they need to improve their management first. When banks have more deposits (increasing leverage) which mean they have more customers, their exceeded funding will be bigger; they need to improve their corporate governance to maintain its operation. These improvements can lead to a decrease of moral hazard to improve its profitability.

2.4 Empirical Evidences

Past studies on capital structure and performance of firms that provides an insight on which further work can be built upon are examined.

For instance, Siddik, Kabiraj et al. [14] concluded the data of 22 banks over a period of 2005-2014 and observed capital structure have negative effect on return on equity, for data analysis used the least square technique.

Zafar, Zeeshan et al. [15] examined that capital structure strongly affects profitability of banking industry listed on Karachi stock exchange.

Meero [16] suggested that financial leverage have indirectly impact on ROA and direct link with equity to asset ratio. For the result used the 16 gulf countries data over the period of 2005 to 2014. They found out positive interaction between performance and size of Islamic banks and Commercial banks

Rajha and Alslehat [17] used the multiple regression model and sample size of two Islamic banks (Jordan Islamic bank and International Arab bank) over the period of 1998-2012. The result analyses show that capital structure has a positive influence on banks profitability and have no effect on bank's profitability

Choong, Thim et al. [18] carried out an empirical study on the performance of Islamic banks in Malaysia. Data collected from 11 local Islamic banks in Malaysia for this study and a regression model comprising of dependent variable (ROA or ROE) and numerous independent variables was used to analyze performance of Islamic commercial banks. The empirical results indicated that credit risk is the most significant meaning in performance of local Islamic Commercial Banking in Malaysian.

Al-Farisi and Hendrawan [19] investigates the effect of capital structure on profit efficiency of Islamic bank and commercial bank. Data collected from 102 conventional and Islamic banks and use the unit root test for analysis. Result based on two stages. First stage suggested Islamic banks in Indonesia have top 20% highest performance score and concluded that capital ratio of banks negatively influence its performance.

Shoaib [6] discovered the agency cost hypothesis of financial institution in Pakistan and uses panel data of 22 banks over the period 2002-2009. The result show that size of bank positively influence on financial performance of banking sector and similar to other researcher.

Pratomo and Ismail [20] concluded that capital structure has impact on profit efficiency of the Islamic banks in Malaysia. They have positive relationship between leverage and profitability. Bank size has inversely relationship with profitability of banks. They argue that agency cost will be low if the debt capital is high.

Muritala [21] examined capital structure optimum level through a firm can enhance its financial performance. The Pesaran and Shine unit root analysis showed that the five years annual data were non-stationary at five per cent significance level. Further findings revealed that there exist a negative association between capital structure and firms' operational performance while the panel data result revealed a positive relationship between asset tangibility, size, asset turnover, age of firm and the performance of firm. Finally,

a significant but negative relationship was seen between asset tangibility and the performance of the firm (ROA).

Amenawo [22] examined a relationship between Capital Structure and the Performance of Quoted Companies in Nigeria. The result showed that Capital mix has a significant relationship with the earnings per share of quoted firms in Nigeria. Debt equity ratio has a significant positive impact on the return on assets of quoted companies in Nigeria and debt asset ratio has a significant inverse relationship with the return on assets of quoted companies in Nigeria. Also debt equity ratio has a significant inverse impact on the return on equity of quoted companies in Nigeria and debt asset ratio has a significant positive impact on return on equity of quoted companies in Nigeria and concluded that Quoted companies in Nigeria should invest their profits when there are good investment opportunities and pay cash dividend as soon as enough income is generated.

Taani [23] examined the impact of capital structure on the performance of Jordanian banks. He made use of annual financial statements of 12 commercial banks listed on the Amman Stock Exchange covering a period of 5 years from 2007-2011. Multiple regressions on performance indicators, such as net profit, return on investment, ROE and net interest margin and total debt to total funds and total debt to total capital that have been applied to the capital structure variables applied multiple regression models to estimate the relationship between capital structure and bank performance. The results show that the bank's performance must be associated significantly and positively with TD; while TD is insignificant to determine the ROE in Jordan's banking sector.

Goyal [24] studied the impact of the capital structure on the profitability of public sector banks in India listed on the National Stock Exchange between 2008 and 2012. Regression analysis was used to establish relationships between ROE, ROA and EPS with capital structure. The results reveal a positive relationship of STDTA with the profitability measured by ROE, ROA and EPS.

Ishaya and Abduljelee [25] investigated capital structure and the profitability of listed companies in Nigeria using the agency cost theory. About 70 selected companies were chosen from the Nigerian stock exchange from 2000 to 2009

using the random effects, fixed effects and Hausman chi-square techniques. The result showed that debt capital was negatively related to profitability, but equity showed a direct relationship with profitability.

Umar et al. [15] examined the impact of the capital structure on the financial performance of the companies in Pakistan of the top 100 consecutive companies on the Karachi Stock Exchange for a period of 4 years from 2006 to 2009. The exponential least squares regression is exponentially used to demonstrate the relationship. The results show that the three variables of the capital structure, STDTA, LTDTA and TDTA, have a negative impact on earnings before interest and taxes (EBIT), ROA, EPS and net profit margin, while the earnings index of price shows a negative relationship with STDTA and the positive relationship is with LTDTA where the relationship is negligible with TDTA. The results also indicate that ROE has a negligible impact on STDTA and TDTA, but there is a positive relationship with LTDTA.

Pouraghajan & Malekian [26] investigate the impact of the capital structure on the financial performance of companies listed on the Tehran Stock Exchange. To this end, they studied a sample of 400 companies in the form of 12 industrial groups over the years from 2006 to 2010. In this study, the ROA and ROE variables used to measure the financial performance of companies. The results suggest that there is a significant negative relationship between the debt ratio and the financial performance of the companies, and a significant positive relationship between the asset turnovers, the size of the company, the asset tangibility ratio and growth opportunities with financial performance. In addition, research results show that reducing the debt management rate can increase the company's profitability and, consequently, the amount of the company's financial performance measures and can also increase shareholders' wealth.

Abbadi and Abu-Rub [27] established a model for measuring the effect of capital structure on bank efficiency in Palestinian financial institutions measured by ROE, ROA, total deposit to assets, total loans to total assets and loans to deposits used to measure the structure of capital. They found that leverage has a negative effect on bank profits, an increase in each ROA and total deposit in assets increases the efficiency of the bank. The study also tested the effect of the aforementioned variables on the

value of the banking market as measured by the Tobin Q. and the findings revealed that leverage has a negative effect on the market value of the bank, a positive and strong relationship between market value and ROA and bank deposits in total deposits.

To Maina and Ishmail [28] capital structure (long-term debt, short-term debt and total debt) has no significant effect on performance (Tobin's Q) of listed firms in Kenya, while controlling for capital structure determinants such as firm size, asset tangibility, opportunity growth and sales growth.

Ahmad, Abdullah, and Roslan [29] examined the effect of capital structure on the firm performance of public listed companies in Malaysia covering two major sectors (Consumers and industrials sector). Fifty-eight (58) firms are used as the sample covering year 2005 through 2010, having 358 observations. Their result indicates that there is significant relationship capital structure variables (Short-term debt and Total debt) and performance measure (return on assets, ROA).

Mohammadzadeh [30] in his study on the effects of capital structure on profitability of entities listed at the Tehran Stock Exchange found that firms' performance which was measured by (EPS & ROA) was negatively related to capital structure.

Mustafa and Osama [31] in their study on the impact of capital structure on the Jordanian firms' performance in the Amman stock market employed the ordinary least squares (OLS) technique in examining about 76 firms for the periods of 2001 to 2006. The findings revealed the presence of negative statistical relationship between capital structure and firm performance.

Lawal [32] examined the effects of Capital Structure on Firm's Performance Empirical Study of Manufacturing Companies in Nigeria. Descriptive and regression research technique was employed. From his findings, he observed that capital structure measures (total debt and debt to equity ratio) are negatively related to firm performance.

Puwanenthiren [33] investigated capital structure and financial performance of some selected companies in Colombo Stock Exchange covering 2005-2009 periods. He found out that the relationship between the capital structure and financial performance is negative.

Nassar [17] looked into the impact of capital structure on financial performance of the firms from Borsa Istanbul and employed a multivariate regression analysis testing the relationship between capital structure and firm performance (EPS, ROA and ROE) and found out that there is a negative significant relationship between capital structure and firm performance.

On the ground of the empirical studies reviewed above, it is therefore hypothesized that:

- H0₁ There is no causal relationship between capital structure and bank performance.
- H0₂ Debt to equity ratio does not have significant and positive effect on banking performance in Nigeria.
- H0₃ Firm's age has no significant impact on performance of banks in Nigeria.
- H0₄ Assets tangibility does not have significant impact on bank performance in Nigeria.

3. METHODOLOGY

The study adopted ex-post facto design. This design is also called causal comparative Research design. When translated literally, ex-post facto means, from what has been done before. It can be described as a historical research design. Ex-post facto design was employed because it is appropriate for the purpose of achieving the objectives of the research since the study also investigates the causal relationships among the relevant variables and the data input were mainly from secondary data. Another justification for adopting this method is because it involves the collection and evaluation of data related to past events that are used to described causes, effects and trends that may explain present or future events. The data for the study were obtained from the annual reports and accounts of the sampled banks from Nigeria Stock exchange fact book. The sample size of the study was selected based on Nigerian stock Exchange classification of the listed companies into financial stratum of homogeneous companies of similar characteristics, which the banking industry forms a strata. This sector comprises of ten (10) listed companies (Access Bank Plc, Stanbic IBTC Plc, First Bank Plc, Union Bank Plc, Fidelity Bank Plc, Guaranty Trust Bank Pc, Sterling Bank Plc, United Bank for Africa Plc, Wema Bank Plc and Zenith Bank Plc) selected for this study over a period of seven years (2012-2018).

3.1 Model Specification

This study uses annual audited reports and accounts of the sampled banks obtained from Nigerian stock exchange fact book covering the period of 2012 to 2018. In the literature reviewed, there have been several models in the area of capital structure and bank financial performance. Panel regression model and granger causality model to test the hypotheses earlier stated is specified thus:

Model I

$$BFP_{it} = f(CS_{it}) \quad (3.1)$$

$$BFP_{it} = f(DETERA_{it}, AGE_{it}, ASTANG_{it}) \quad (3.2)$$

Where:

- BFP = Bank Financial Performance (ROA and ROE)
- CS =Capital structure
- DETERA =Debt to equity ratio
- AGE =Age of the Banks
- ASTANG =Assets tangibility

Equation 3.2 can be restated in econometric form as:

$$ROE_{it} = \beta_0 + \beta_1 DETERA_{it} + \beta_2 AGE_{it} + \beta_3 ASTANG_{it} + \varepsilon_{it} \quad (3.3)$$

$$ROA_{it} = \beta_0 + \beta_1 DETERA_{it} + \beta_2 AGE_{it} + \beta_3 ASTANG_{it} + \varepsilon_{it} \quad (3.4)$$

Where

- ROE is Return on equity of selected quoted banks*
- ROA is Return on assets of selected quoted banks*
- DETERA is Debt to equity ratio of selected quoted bank*
- ASTANG is the Asset tangibility of selected quoted banks*
- it is the firm i in time t*
- β is the constant coefficient*
- $\beta_1 - \beta_3$ are regression coefficients for measuring independent variables*
- ε =error term*

Model II

In other to achieve the first objective of the study, the study employs the granger causality test so as to see the direction of causality between capital structure and financial performance of banks. The model takes the form as specified below:

$$ROA_{it} = \beta_0 + \sum_{i=1}^k \beta_1 DETERA_{it-1} + \sum_{i=1}^k \beta_2 ASTANG_{it-1} + \sum_{i=1}^k \beta_3 AGE_{it-1} + \sum_{i=1}^k \varphi_1 ROA_{it-1} + \varepsilon_{1t} \quad 3.5$$

$$DETERA_{it} = \alpha_0 + \sum_{i=1}^k \alpha_1 ASTANG_{it-1} + \sum_{i=1}^k \alpha_2 AGE_{it-1} + \sum_{i=1}^k \alpha_3 ROA_{it-1} + \sum_{i=1}^k \delta_1 DETERA_{it-1} + \varepsilon_{2t} \quad 3.6$$

$$ASTANG_{it} = \partial_0 + \sum_{i=1}^k \partial_1 AGE_{it-1} + \sum_{i=1}^k \partial_2 ROA_{it-1} + \sum_{i=1}^k \partial_3 DETERA_{it-1} + \sum_{i=1}^k \delta_1 ASTANG_{it-1} + \varepsilon_{3t} \quad 3.7$$

$$AGE_{it} = \omega_0 + \sum_{i=1}^k \omega_1 ROA_{it-1} + \sum_{i=1}^k \omega_2 DETERA_{it-1} + \sum_{i=1}^k \omega_3 ASTANG_{it-1} + \sum_{i=1}^k \varphi_1 AGE_{it-1} + \varepsilon_{4t} \quad 3.8$$

$$ROE_{it} = \beta_0 + \sum_{i=1}^k \beta_1 DETERA_{it-1} + \sum_{i=1}^k \beta_2 ASTANG_{it-1} + \sum_{i=1}^k \beta_3 AGE_{it-1} + \sum_{i=1}^k \varphi_1 ROE_{it-1} + \varepsilon_{5t} \quad 3.9$$

$$DETERA_{it} = \alpha_0 + \sum_{i=1}^k \alpha_1 ASTANG_{it-1} + \sum_{i=1}^k \alpha_2 AGE_{it-1} + \sum_{i=1}^k \alpha_3 ROE_{it-1} + \sum_{i=1}^k \delta_1 DETERA_{it-1} + \varepsilon_t \quad 3.10$$

$$ASTANG_{it} = \partial_0 + \sum_{i=1}^k \partial_1 AGE_{it-1} + \sum_{i=1}^k \partial_2 ROE_{it-1} + \sum_{i=1}^k \partial_3 DETERA_{it-1} + \sum_{i=1}^k \delta_1 ASTANG_{it-1} + \varepsilon_{6t} \quad 3.11$$

$$AGE_{it} = \omega_0 + \sum_{i=1}^k \omega_1 ROE_{it-1} + \sum_{i=1}^k \omega_2 DETERA_{it-1} + \sum_{i=1}^k \omega_3 ASTANG_{it-1} + \sum_{i=1}^k \varphi_1 AGE_{it-1} + \varepsilon_{7t} \quad 3.12$$

Where;

It is assumed that the error terms are uncorrelated. Equation 3.5 to 3.8 is used to determine the causality between ROA and other independent variables used for the capital structure while equation 3.9 to 3.12 is used for the causality between ROE and other variables.

The null hypothesis is that ROA does not granger cause other variables and vice versa. So also, ROE does not granger cause the independent variables and vice versa. The F-statistics is compared. If the F-statistics is significant for any of the coefficient then the null hypothesis is rejected.

Table 3.1. Summary of variables used in the study and their Definition

S/N	VARIABLES		DEFINITION
Dependent Variables			
1	Return on Assets	ROA	<u>Net income</u> Total Assets
2	Return on Equity	ROE	<u>Net income</u> Shareholders' equity
Independent Variables			
3	Debt to Equity	DETERA	<u>Total Liabilities</u> Shareholders' Equity
Control Variable			
4	Asset Tangibility	ASTANG	<u>Total Fixed Tangible Assets</u> Total Assets
5	Age of the Banks	AGE	Log of No. of years since the company is incorporated

Source: Designed by the Author (2019)

Table 4.1. Correlation matrix

	ROA	ROE	ASTANG	AGE	DETERA
ROA	1				
ROE	0.4879	1			
ASTANG	-0.1096	-0.0364	1		
AGE	-0.5240	-0.1518	-0.0726	1	
DETERA	-0.3654	-0.4132	-0.0555	-0.0085	1

Source: From E-Views 9

Justification for Using the Above Ratios

- i ROE: It helps investors to gauge how their investments are generating income.
- ii ROA: It helps investors measure how management is using its assets or resources to generate more income
- iii DETERA: It assesses the extent to which a firm is using borrowed funds.
- iv ASTANG: Creditors believed that firms with higher tangible assets can use debt more easily and can fulfill their obligations with ease.
- v AGE: Variation in gearing level might be explained by the increase in the age of firms which could compel managers to focus a significant part of their attention on the intrinsic characteristics of their firms and its financing decisions[34].

3.2 A priori Expectation

The a priori expectations of the coefficients are indicated to be positive, which implies that capital structure is supposed to have a positive effect on performance of banks in Nigeria. It is stated as: $\beta_0 < 0$; $\beta_1 - \beta_3 > 0$.

4. DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Preliminary Data Analysis

Correlation Analysis: This section looks at the correlation among capital structure indicators/proxies such as Debt to equity ratio, short term debt to total asset, long term debt to total asset and size of the firm. The rule of thumb for correlation between two variables ranges between 0 and 0.3. It implies a weak relationship exists between the variables.

Also, when the correlation ranges between 0.4 and 0.9, it can be said that a strong relationship between the variables exists.

In the Table 4.1, Return on Assets (ROA) is positively correlated with Return on Equity (ROE) but negatively correlated with Asset Tangibility (ASTANG), Age of the banks (AGE) and Debt to equity ratio (DETERA) at 0.10, 0.52 and 0.36 respectively.

Also, Return on Equity (ROE) has a negative correlation with Asset tangibility, Age of the Bank (AGE) and Debt to equity ratio (DETERA) at 0.03, 0.15 and 0.41 respectively. For Asset tangibility (ASTANG), there exists also a negative relationship between Age of the bank (AGE) and Debt to equity ratio (DETERA) at 0.07 and 0.05. Finally, there is a negative correlation between Age of the Banks (AGE) and Debt to equity ratio (DETERA) at 0.008. Hence, the results revealed that the correlation among the variables is generally weak.

Unit Root Test: Since time series data are prone to spurious regression and a way out of this is to test for stationarity of all variables using the Augmented Dickey Fuller Unit Root Test.

Table 4.2 pictures the results of the various unit root tests carried out for the purpose of identifying the features of the variables under investigation. The unit root tests carried out include Levin, Lin and Chu t, Im, Pesaran and shin (IPS), Augmented Dickey-Fuller (ADF) and Phillips-Peron Fisher chi-square accompanied by their various probability values in brackets.

The unit root test was run, allowing E-views to select the appropriate lag length for the test based on the Schwarz information criteria (SIC). Also these tests were carried out with constant but no trend. The hypothesis tested was the presence of unit root in the variables.

From the results obtained in Table 4.2 and following the majority of these results, it can be concluded that all variables employed in this study are stationary at all levels as shown in the unit root test column. None of the variable was integrated at first difference and second difference. Hence, the significance of the test nullifies the earlier hypotheses stated.

4.2 Hypotheses Testing

Granger Causality Test: The result from the Table 4.3 shows a unidirectional relationship between asset tangibility and debt to equity ratio. This indicates that causality runs from asset tangibility to debt to equity ratio (F -statistics = 3.23793; $P = 0.0486$) and not from debt to equity ratio to asset tangibility showing that the null hypothesis that asset tangibility does not granger cause debt to equity ratio was rejected while the null hypothesis that debt to equity ratio does not granger cause asset tangibility was accepted.

However, the findings also revealed that there exists no causal relationship between return on equity and return on asset, debt to equity ratio and return on asset, age and return on asset, debt to equity ratio and return on equity, asset tangibility and return on equity, age and return on equity, age and debt to equity ratio, age and asset tangibility.

4.3 Panel Regression Results

Capital structure and financial performance (ROE) of listed banks in Nigeria: The outcome from the regression results in Table 4.4 shows that Debt to equity ratio (DETERA) is a significant variable that determines the financial performance (ROE) of banks in Nigeria. However, it has a negative impact on Banks financial performance. Possible reasons for non-conformity of this result to a priori expectation might be that the selected deposit money banks in Nigeria takes more of short term deposits than long term deposits from customers which takes longer time before maturity as deposits made by customers are being used for investments to generate profits. Banks who take delight in sourcing for short term loan in form of deposits to

Table 4.2. Summary of unit root tests

	Levin, Lin & Chu t	Im, Pesaran and Shin W-stat	ADF- Fisher Chi-square	PP- Fisher Chi-square
ROE	-223.548*** (0.000)	-40.5250*** (0.000)	48.9606** (0.000)	66.0165*** (0.000)
ROA	-97.2621*** (0.000)	-18.7780*** (0.000)	50.9152*** (0.000)	95.7254*** (0.000)
Age	-30.6539*** (0.000)	-210.269*** (0.000)	122.510*** (0.000)	122.811*** (0.000)
Detera	-16.2826*** (0.000)	-3.04965*** (0.001)	39.2045*** (0.006)	41.0791** (0.003)
Astang	-3.39713*** (0.000)	-0.73452** (0.023)	27.8591 (0.112)	36.7517** (0.012)

***, **, * implies the level of significant from 1%, 5% to 10% respectively Source: Results from E-views 9

Table 4.3. Granger causality tests

Null Hypothesis:	Obs	F-Statistic	Prob.
ROE does not Granger Cause ROA	50	0.53357	0.5902
ROA does not Granger Cause ROE		1.59083	0.2150
DR does not Granger Cause ROA	50	0.22296	0.8010
ROA does not Granger Cause DR		0.94976	0.3945
ASTANG does not Granger Cause ROA	50	0.24566	0.7832
ROA does not Granger Cause ASTANG		0.20208	0.8178
AGE does not Granger Cause ROA	50	1.09960	0.3418
ROA does not Granger Cause AGE		0.28415	0.7540
DR does not Granger Cause ROE	50	0.35427	0.7036
ROE does not Granger Cause DR		0.54334	0.5846
ASTANG does not Granger Cause ROE	50	0.03123	0.9693
ROE does not Granger Cause ASTANG		0.34190	0.7122
AGE does not Granger Cause ROE	50	3.11123	0.0543
ROE does not Granger Cause AGE		0.25064	0.7794
ASTANG does not Granger Cause DETERA	50	3.23793	0.0486
DETERA does not Granger Cause ASTANG		0.16068	0.8520
AGE does not Granger Cause DETERA	50	2.63952	0.0824
DETERA does not Granger Cause AGE		0.10738	0.8984
AGE does not Granger Cause ASTANG	50	0.24846	0.7811
ASTANG does not Granger Cause AGE		0.01618	0.9840

Source: Results from E-views 9

Table 4.4. Regression results dependent variable: ROE

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	5.284	1.283	4.118	0.000***
DETERA	-5.357	1.447	-3.703	0.000***
ASTANG	-0.353	0.548	-0.643	0.522
LOG(AGE)	-0.149	0.093	-1.597	0.115
R-squared		0.205		
Adjusted R-square		0.169		
F-statistic		5.674		
Prob.(F-statistic)		0.001**		
Durbin-Watson stat		1.012		

***, **, * implies the level of significant from 1%, 5% to 10% respectively; Source: Author's Data Analysis, 2019

Table 4.5. Regression results dependent variable: ROA

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	0.182	0.029	6.347	0.000***
DETERA	-0.127	0.032	-3.911	0.000***
ASTANG	-0.023	0.012	-1.92	0.059**
LOG(AGE)	-0.014	0.002	-6.746	0.000***
R-squared		0.497		
Adjusted R-square		0.474		
F-statistic		21.758		
Prob.(F-statistic)		0.000***		
Durbin-Watson stat		0.525		

***, **, * implies the level of significant from 1%, 5% to 10% respectively source: author's data analysis, 2019

Finance its operations are mostly vulnerable to financial instability. The panel regression also revealed that all the explanatory variables accounted for about 17% in the variation of return on Equity.

Capital structure and financial performance (ROA) of listed banks in Nigeria: Looking at the regression results in Table 4.5; all the capital structure variables (Debt to equity ratio, asset tangibility and age) are negatively significant to return on asset of Banks in Nigeria. Though debt to equity ratio was significant, it could not increase the return on assets of banks as expected, hence there is approximately 13% (0.1266×100) decline in the returns accrued to the Bank over the years. This result negates the position of the a priori expectation as they are negatively related to Bank performance.

In the same vein, asset tangibility was negatively significant to financial performance of Banks in Nigeria. This implies that if banks were to rely on tangibility of its asset for survival, the performance over the years will still not be encouraging as expected as the amount of losses incurred from irrecoverable debts overwhelms the available tangible assets that would have serve as collateral securities in times of financial distresses. Age on the other hand also impacted returns on bank assets negatively. The adjusted R-squared of 0.47 indicates that 47% in the variation of return on asset is explained by debt to equity ratio, asset tangibility and age. On a whole, the results does not conform with the a priori expectation and it is also supported by the work of [27,29,25,32, 16,11,30,31,33,14,35]. It is therefore established that capital structure has a negative influence on Bank performance and brings no improvement to the wealth of shareholders.

5. CONCLUSION

On the premise of the findings of the study, the study concluded as follows:

- i. Debt to equity as key capital structure component was significant but impacted negatively on the returns on asset and return on equity of deposit money banks in Nigeria.
- ii. There is no direction of causality between debt to equity ratio, age of banks, asset tangibility and return on asset of banks

- iii. There is a one way causality running from asset tangibility to debt-equity
- iv. Firm age, has negative impact on the return on equity and return of asset of the bank but only significant with the return on asset of the bank
- v. Asset tangibility have negative impact on the return on equity and return of asset of the bank but only significant with the return on asset of the bank.

6. RECOMMENDATION

The research work considered the peculiarities of financial institutions (Banking industries) because financial sector is very imperative to any nation generally and Nigeria in particular. The study specifically shifted attention to banking sector as most attention was focused on manufacturing companies in Nigeria and relying on the findings of this study, the following recommendations are made:

- i. Alertness of finance managers as to movement in the stock market.
- ii. The appropriate capital mix should be tailored towards viable investment opportunities for maximum return of shareholders wealth and value of the company.
- iii. Nigeria banks should take precautionary measures for mitigating credit risk associated with lending and borrowing

COMPETING INTEREST

Authors have declared that no competing interests exist

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