

CAPITAL STRUCTURE AND PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

Capital structure is one of the core decision areas in the field of finance, as it determines the existing amount of debt and equity of a bank. It is an important decision that has a close relationship with the value of bank hence its performance. Accordingly, the general objective of this study is to assess the impact of capital structure on the financial performance of Bank in Nigeria with specific reference to how debt ratio and equity ratio affect return on equity and net interest margin of banks in Nigeria. The population of the study is the entire 21 licensed DMBs in Nigeria (CBN, 2017). The sample size of 12 banks was determined using convenience sampling technique for the period 2007- 2016. The study utilizes panel design to analyse the data based on random effect estimation. The study found a positive relationship with financial performance measured by Net Interest Margin (NIM). The study recommends that more incentives need to be given to STD suppliers to effectively adjust the maturity structure of STDs. Similarly, debt should be used with caution in order to explore its tax shield and managerial efficiency benefits.

Keywords: Capital Structure, Financial Performance, Deposit Money Banks

1. Introduction

Capital structure is among the core decision areas in the field of finance. It determines the outstanding amount of debt and equity of a firm. It is an essential decision that has an intimate relationship with the value of firm (Paramasivan and Subramanian, 2008). This is due to the fact that capital structure has direct connection with the firm's ability to fulfil the desires of its different stakeholders (Olokoyo, 2012). Capital structure also influences firm's ability to deal with the competitive environment (Martis, 2013). This suggests that an optimal capital structure decision is essential to the firm's survival (Ganiyu, 2015). Optimal capital structure represents the best combination of debt and equity that produce low cost of capital and maximises the firm's value. Consequently, poor capital structure decision, for example wrong mix of debt and equity may lead high cost of capital, increase financial risk, lower the firm's financial performance and eventually hinder its survival (Anarfo, 2015). This implies that inefficient capital structure decision may force a firm to extinction.

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Financial performance determines the firm's efficiency in resources utilisation, in addition to its ability to make profit (Aymen, 2013). Financial performance of DMBs is paramount because of the critical role the industry plays in the economy in terms of provision of financial intermediation, transmission mechanism of monetary policy and maintenance of economic stability (Abbadi and Abu-rub, 2012). Stressing the importance of sound financial performance in the banking industry, Scott and Timothy's study (as cited in Ronoh and Ntoiti, 2015) pointed out that banks with sound financial performance and sufficient capital can withstand adverse shocks. This implies that a sound banking sector will remain firm and continue to provide the needed financial intermediation services. Thus, a healthy and sound banking sector enhances financial deepening, creates more employment opportunities and promotes financial stability (Hafiz, 2018).

However, financial stability report indicates a declining trend in the Nigerian banks' financial performance metrics. For instance, return on equity (ROE) and return on assets (ROA) have dropped from 14.90 and 2.67 percent in 2007 to 1.18 percent and 0.16 percent in 2016 (IMF, 2017; CBN, 2016). This development is capable of corroding public confidence and in the extreme, could trigger runs on the banks. Hence, the need for improvement in the key decision areas such as capital structure becomes imperative, because of their close relationship with the bank's performance and survival.

The seminal exertion of Modigliani and Miller in 1958 formed the foundation of capital structure study. They posited that various combinations of debt and equity are irrelevant to the firm's value. Afterward, the relationship between capital structure and financial performance has been studied substantially in both developed and developing countries with varying outcomes. Similarly, in Nigeria, there are studies on the relationship between capital structure and financial performance for both non-financial sectors (for example, Igbinsosa, 2015 ; Chechet and Olayila, 2014; Arowoshegbe and Idialu, 2013; Uwoloma and Udiale, 2012; Onaolapo and Kajola, 2010) and financial sector specifically the banking sector that include the study of Idode, Adeleke, Ogunlowore, and Ashogbon (2014) on influence of capital structure on profitability of listed Nigerian banks, the impact of post-consolidation capital structure on the financial performance of quoted Nigerian banks by Adesina, Nwidobie and Adesina (2015), Uchechukwu and Kinsley (2016) regarding the effect of capital structure on firm performance of selected quoted banks in Nigeria, Shaba, Yaaba and Abubakar (2016) and Sadiq, Kachollom, Dasuki, and Yusuf, (2017).

However, none of the prior studies from the context of banking sector consider different categories of debts such as short term debt (STD) and long term debt (LTD) as indicators of capital structure. Regarding the financial performance indicators, net interest margin (NIM) serves as a core banking specific performance indicator which has been to a large extent ignored in the previous studies. According to CBN (2013) margin metrics such as net interest margin (NIM) and net non-interest margin (NNIM) have recently turned out to be crucial indicators to banks' management, regulatory authorities and the general public. Moreover, NIM shows the cost and efficiency of bank's financial intermediation (Saksonova, 2014). This scenery therefore creates

room for further studies so that empirical evidences could be established from the Nigerian context.

Hence, this study intends to bridge the gap in knowledge by empirically assessing the robustness of the extent of relationship between capital structure metrics (short term debt ratio, long term debt ratio, total debt ratio and equity ratio) and financial performance of Nigerian banks using banks' core business financial performance indicator, the net interest margin(NIM).

Subsequent to the introduction, Section 2 presents the literature review, empirical studies and theoretical framework. Section 3 presents methodology. In section 4 empirical results were presented. Finally, section 5 occupies the conclusion and recommendation.

2. Literature Review

In the literature review the paper presents categorisation of DMBs in Nigeria, conceptual and empirical review, theoretical framework and hypotheses development.

2.1 Categorisation of DMBs in Nigeria

Following the repealed of the Universal Banking model in 2010, the new regulation provides that DMBs should operate within one of the following three categories (CBN, 2010): -

a. Regional Bank

A bank in Nigeria with regional commercial banking authorisation license is permitted to conduct its commercial banking operations in at least six (6) states and at most in twelve (12) bordering States of the federation, spreading in not more than two (2) Geo-Political regions of the federation, plus the Federal Capital Territory. The banks that fall under this category are 2, the Suntrust Bank Nigeria Limited and Providus Bank Plc.

b. National Bank

A bank in Nigeria with national commercial banking license is allowed to undertake its functions in all States of the federation including Abuja. There are nine (9) banks that fall in this category, these banks include but not limited to Citibank Nigeria Limited, Unity Bank Plc and Heritage Banking Company Limited.

c. International Bank

A bank having international banking license is given the right to carry out its banking business operations in all States of the Federation, in addition it is also allowed to establish and maintain offshore banking operations in countries of its choice, subject to the CBN's approval and the host country regulatory

requirements. 10 banks fall under this stratum, for example Access bank, Zenith bank, Diamond bank, UBA and GTbank all are in this category.

The regulation also provides that the regional banks should have minimum paid up capital of ₦10 billion, ₦25 billion for the national banks and for banks with international authorisation license they should have a minimum paid up capital of ₦50 billion (CBN, 2010).

2.2 Conceptual and Empirical Review

Capital structure is basically the way and manner in which a company finances its assets to generate income which invariably maximize the shareholders' wealth. Saeed, Gull, and Rasheed (2013) opined that capital structure was indeed linked with different varieties of funding vehicles utilized by a company to get assets essential for its procedures as well as development. In the same direction Uwalomwa and Uadiale (2012) considered it as a mixture of company's long-term debt, specific short-term debt, common equity and preferred equity. Capital structure essentially depicts how a company funds its overall functions and growth by using diverse sources of funds. The company that is entirely financed by all equity is regarded as unlevered whereas firm that is financed with all debts is considered highly levered firm. However, it is not practically possible to finance firm entirely with debts in reality. Modigliani and Miller, (as cited in Chechet and Olayiwola , 2014) further stated that a firm that is all equity financed, the whole of its after-tax cash flows (profit) is a benefit to the shareholders inform of dividends and retained earnings.

In contrast, company with certain proportion of debts in its capital structure shall devote a portion of the profit after tax to debt servicing (Chechet and Olayiwola, 2014). Hence, appropriate capital structure is closely related to the value of the firm (Tifow and Sayilir, 2015). In their study, Kundakchyan and Zulfakarova (2014) stated that an optimal mix of components of capital structure ensures corporate soundness, maximize return on capital and minimize financial risks. Conversely, the capital structure in banking sector is unique as compared to other business firms. Operationally, banks are financial intermediaries that pool together money from surplus units and lend them to deficit units in the society (Kipesha and Moshi, 2014). In their study, Mostafa et al. (2011) opined that for banks to extend credit lines, entail mobilization of more funds such as acceptance new deposits, borrowing from other banks or equity issue. In confirmation of above assertion, Allen and Carletti (2013) contended that banks differ from other firms from the viewpoint of deposits mobilization. However, Miller (1995) opines that MM theory that formed the basis of capital structure theories can be applied to banks, basing his argument with the case of IBM lease financing subsidiary whose short term liability security "Variable Rate Book Entry Demand Note", is functionally equivalent to demand deposits.

Financial performance refers to financial metrics or indicators employed in determining the general well-being of a given entity. Bhunia, Mukhuti and Roy (2011) defined financial performance as firm's overall financial health over a given period of time. The study added that analysis of financial performance is aimed at assessing the feasibility,

solidity and fertility of a business. This implies that financial performance represents the result of firm's operation in monetary terms for a specific period.

Financial managers use ratios from company financial statement to assess its financial performance (Watson and Head, 2007; Bhunia, et al. 2011). One of the key factors used in measuring financial performance is profitability which according to Ross, Westerfield and Jaffe (2002) is the extent to which firm is able to generate profit from its operations. Profitability is the crucial objective of all business ventures; this is because the long run existence of these ventures depends upon their profitable operations. Its measurement is most remarkable indicator of business success (Khan, Sajid, Waseem and Shehzad, 2016). Samhan and Al-Khatib (2015) conduct a study on determinants of financial performance of Jordan Islamic Bank, covering the period year 2000 to 2012, return on assets (ROA), return on equity (ROE), and return on unrestricted investment accounts (ROUIA) were used to measure financial performance. Similarly, CBN in 2013 has buttressed the importance of the net interest margin (NIM) as an indicator of bank performance.

Capital structure is an important decision for the survival and financial performance of banks because it affects the firm's value. Debt and equity are the main components used by previous studies (for example, Sadiq et al., 2015; Ronoh and Ntoiti 2015) to measure capital structure of firms. In order to understand the relationship between capital structure and financial performance better, individual component of capital structure are discussed separately to outline how each component affects financial performance.

Reaching a satisfactory debt level is critical for any business, not only because of the need to achieve profitability and firm value, but also because it increases an organization's ability to deal with its competitive environment (Yazdanfar and Öhman, 2015). Debt capital is the money owed to others by the firm which must be repaid back within an agreed period of time (Kajirwa, 2015). Some varieties of debt instruments include but not limited to bonds and long-term notes payable (Siro, 2013).

Furthermore, the use of debt capital may improve profit of an entity through shielding of tax ((Modigliani and Miller, 1963). In the same vein, debt capital increases the pressure on managers thereby motivating them to perform more efficiently. As a result, debt financing reduces moral hazard behaviour by reducing free cash flow (Yazdanfar and Öhman, 2015). However, debt capital comes with a cost because interest on money borrowed needs to be paid as at when due, this increases firm's financial risk (Kajirwa, 2015).

Enekwe, Agu and Nnagbogu (2014) found that the amount of debts in the firm's capital structure bears a negative insignificant relationship with the financial performance. This entails that firms do not assign much value to the debt financing for their growth. In a similar view, an empirical evidence provided by Sadiq, et al. (2017) have applied Pearson correlation coefficient and GLS regression model to examine the effect of capital structure on profitability of listed DMBs, the study found that capital structure has an effect on the financial performance of listed deposit money banks in Nigeria. The study recommends that deposit money banks in Nigeria should employ an

appropriate mix of debt and equity capital. However, the study cannot be generalised due to its scope that limits its sample to four banks and possibility of spurious regression as shown by high R squared value of about 89%. Similarly, Shaba, Yaaba and Abubakar (2016) study the relationship between capital structure and profitability of deposit money banks in Nigeria. Applying autoregressive distributed lag model on a sample of 13 DMBs from 2005 through 2014, the study found that about 83 per cent of total assets employed by the DMBs are not financed by owners, confirming the hypothesis that banks are highly levered institutions. The results further found a positive and significant impact of both owners' and borrowed funds on profitability proxied by gross earnings. Nevertheless, CBN (2013) has reinforced the importance of interest margins to account for the financial performance of banks in Nigeria which limits the study. Furthermore, Abubakar (2015) examined the relationship between financial leverage and financial performance, correlation technique used found an insignificant relationship between debt ratio and return on equity, and this indicates that the high debt ratio in the banks' capital structure does not influence financial performance proxied by ROE. The major limitation of the study is the correlation method of analysis that was used to examine the causal effect instead regression, which is more appropriate technique.

Awunyo-Victor and Badu (2012) in the study of Ghanaian banks found a negative relationship between leverage and return on equity at 10 percent level of significance. This implies that if banks decide to employ higher proportion of debt to finance their operations, their financial performance will reduce due to increase in the interest payment. Meaning that, an increase in the level of debt in the bank's capital structure may result to high financial risk, and subsequently increases the risk of financial distress and bankruptcy. However, their result cannot be relied upon for the fact that conventionally the significance level for social and management sciences is 5 percent. Taani (2013) found that total debt ratio is a significant determinant of financial performance of Jordanian banks disagrees with this proposition.

Bank access to equity capital perhaps has bearing on its ability to avoid bankruptcy cost (Aymen, 2013). Equity capital can be viewed from two dimensions (Aburime, 2008). These are the amount contributed by the owners of a bank (paid-up share capital) that gives them the right to enjoy all the future earnings and other funds available to support a bank's business such as retained earnings and reserves. Equity capital is also termed as total shareholders' funds. Bank's equity capital is widely used as one of the determinants of bank profitability since it indicates the financial strength of the bank (Mungly et al., 2016). Furthermore, Aburime (2008) suggested that the bank level of safety can be achieved by high capital level which could generate positive net benefits. Because banks with enough capital have the ability to absorb shocks from the problem of non-performing loans and provides a better shield to depositors in time of liquidation. Despite the role of equity capital as the most effective loss-absorption financial instrument, yet it possesses some social costs if it was achieved by holding back funds that are supposed to be granted as credit or through charging higher interest rates on credits (Oliver, Ruano and Fum'asc, 2013).

Empirical evidence presented by Shaba, Yaaba and Abubakar (2016) revealed that the equity ratio which is the measure of the capital structure posted a positive relation

with the banks financial Performance in Nigeria. This is however in contrast with the findings of Ronoh and Ntoiti, (2015). Prior studies such as Abubakar (2015) and Hailu (2015) have suggested the use of different metrics of capital structure and financial performance in future studies. The model of this paper therefore has been modified to capture different metrics of capital structure and financial performance. The metrics selected are short term debt ratio, long term debt ratio, debt ratio, and equity ratio to measure the independent variable. Whereas net interest margin (NIM) is to measure the dependent variable. These metrics are valid indicators of capital structure that were used by prior studies such as Abbadı and Abu-Rub (2012), Goyal, (2013), Taani (2013), Noor and Suardi, (2015) and Gebremichael (2016). Similarly, the financial performance indicator chosen was used in the following works (Naceur and Omran, 2011; Ongore and Kusa, 2013).

Following similar studies (for example, Yadav and Salim, 2012; Goyal, 2013; Anafo, Amponteng and Yin, 2015; Siddik, Kabiraj and Johgee, 2017), a set of control variables such as, bank size, and growth were selected in this paper. These control variables were deployed to avoid model misspecification and to hold constant some bank specific determinants of financial performance that may affect the result of the study.

2.3 Theoretical Framework

Many theories relating to capital structure have been put forward by various scholars in the field of corporate finance. These include the work of Modigliani and Miller in 1958, which assumed that under the premise of perfect capital market various combinations of debt and equity are irrelevant to the firm's value (Modigliani and Miller, 1958). Later, this assumption was relaxed to accommodate the effect of tax benefits on debt finance (Modigliani and Miller, 1963). Trade-off theory which assumes that firms trade off the benefits and costs of debt and equity financing and find an optimal capital structure after accounting for market imperfections such as taxes, bankruptcy costs and agency costs. Myers and Majluf (1984) in their pecking order theory argued that firms follow a financing hierarchy to minimize the problem of information asymmetry between the firm's managers (insiders) and the (outsiders)shareholders or investors. Jensen and Meckling agency cost theory of 1976 suggested that, given an increasing conflict of interest between managers and the business owners, presence of more debt level in the firm's capital structure imposes financial discipline, hence reduces agency problem. However, in order to connect capital structure and banks' financial performance agency cost theory was adopted. The theory seems to be more relevant to the environment where laws are broken with impunity, capital market is inefficient and surrounded by several imperfections, and corporate governance from the side of firm is weak. These features are aligning with the most emerging markets such as Nigeria. Olokoyo (2013) has also used this theory in her study on the listed non-financial firms in Nigeria.

2.3.1 Agency Cost Theory

Jensen and Meckling (1976) define the agency relationship inside the firm as: "A contract under which one or more person (the principal) engages another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent". According to this theory, the agent

manager may pursue his personal objective or deliberately act in such a way that portrays lack of commitment, self-centeredness which may lead to firm losing its value significantly in contrast with the overall firm's objectives that will maximize its value. Consequently, conflict of interest may arise between the manager and the firm's owners. Taking up more debt financing may reduce agency cost problems, apart from meeting up the expectation of shareholders, managers must strive hard to redeem the fixed obligation of debt. Therefore, managers are motivated to act in such a way that will protect their interest in terms of job security and welfare. Gansuwan and Önel(2012) added that debt engenders financial discipline. The agency cost theory backs a positive relationship between capital structure and financial performance.

2.3.2 Trade off theory

The trade-off theory was formed from the works of Kraus and Litzenberger (1973), Miller (1977), Scott (1977) and Kim (1978) among others. The theory suggests that firm's capital structure depends on the tradeoff between the tax shield benefit of using debt and its attendant consequences in form of financial distress. The inconsequential gain from further debt declines with increase of debt proportion in firm's capital structure, this also increases the marginal cost. Hence, for firm to achieve its overall value, tradeoff has to be central in choosing the proportion of debt and equity that it intends to use for financing its operation.

3. Methodology

The research design adopted for this paper is panel design. The reason for this choice was that panel research strategy allows for repeated observations of some quantities about the same entities of study over time (Brooks, 2008). Similarly, according to Gujarati (2004) "panel design has advantage of more degrees of freedom, more efficiency and less collinearity".

3.1 Sample and Data

There are 21 DMBs in Nigeria as at December 2017, but the sample of banks to be included in this paper depends on the availability of data. For this reason, three filters were used to conveniently select the sample size. The filters are that the bank must be listed, not delisted and should have full length of data for the period. Furthermore, a listed company is expected to comply with the NSE's requirement of financial disclosure. Hence, their financial reports are expected to be easily accessible and readily available. The result of this process displayed in Table 1, has produced 12 DMBs that accounts for 80 percent of listed banks population in Nigeria, 8 of these banks are from international stratum and 4 are from national stratum, as such their annual financial reports for 10 years covering 2007 to 2016 was used. In all the study has 120 observations or data points making it a balanced panel study.

Evidence from prior empirical studies showed that data was analysed using different approaches ranging from Spearman's correlation, Ordinary Least Squares Regression (OLS), Panel Corrected Standard Error (PCSE) to establish the relationship between

capital structure and financial performance (Abubakar, 2015; Amara and Aziz, 2014; Sadikk et al, 2017).

Table 1: Sample Size of the study

S/N	Name	Category	NSE Status
1	Access Bank Plc	International	Listed
2	Diamond Bank Plc	International	Listed
3	Ecobank Nigeria Plc	National	Listed
4	Fidelity Bank Plc	International	Listed
5	First Bank of Nigeria Plc	International	Listed
6	First City Monument Bank Plc	International	Listed
7	Guaranty Trust Bank Plc	International	Listed
8	Stanbic IBTC Bank Plc.	National	Listed
9	Sterling Bank Plc	National	Listed
10	United Bank for Africa Plc	International	Listed
11	Unity Bank Plc	National	Listed
12	Zenith Bank Plc	International	Listed

Adapted and modified (CBN and NSE, 2017)

3.2 Method of Data Analysis

Hausman test was conducted in order to choose the most appropriate panel estimation between fixed effect and random effect (Hausman, 1978). The test provides two estimates and compares the slope of their coefficients. The threshold is based on 5% level of significance, therefore if the P-value is greater than 5% , then the random effect model prevails otherwise fixed effect. The Hausman test result indicates $X^2 = 1.87$; $P > X^2 = 0.9316$, the P-value is greater than the 5% level of significance indicating that random effect model is the appropriate estimator than fixed effect. Similarly, the result of Breusch and Pagan Lagrangian multiplier test further validates the choice for random effects estimator with P-value of 0.000 which is less than 5 % level of significance, implying the presence of significant differences among the sampled listed DMBs.

Similarly, post estimation regression diagnostic tests were conducted to ascertain the validity of the statistical inferences for the study and the results of normality and model specification tests are found to be favourable. However, the results of heteroskedasticity test and autocorrelation test are unfavourable. To remedy these problems an option of robust standard error was adopted in the estimation (Hoechle, 2007; Wooldridge, 2002,). Efficiency of estimator is generally improved by robust standard error (Green, 2008).

3.3 Model Specification

To estimate the relationship between each of capital structure indicator (STD, LTD, DR, ER) , with the listed banks' financial performance (NIM) control variables i.e. (GR and BZ) were included in the model to isolate the effect of banks specific factors on financial performance indicator during the period. Hence, the mathematical expression of random effect estimation model for this paper is presented below:

$$Y_{it} = \beta X_{it} + \alpha + U_{it} + \varepsilon_{it} \dots\dots\dots(1)$$

Where Y denotes the dependent variable, β is the coefficient of independent variable X, α symbolises an intercept, U represents between entity errors, ε represents within entity error,

i represents the cross-sectional units and t is the time period.

Thus the equation (1) becomes

$$NIM = \beta_1 STD_{it} + \beta_2 LTD_{it} + \beta_3 DR_{it} + \beta_4 ER_{it} + \beta_5 LIQ_{it} + \beta_6 BSZ_{it} + \beta_7 GR_{it} + \alpha + U_{it} + \varepsilon_{it} \dots\dots(ii)$$

Where:

β_1 - β_7 denote the coefficients,

i represents the Nigerian banks (1-13),

t is the time period of the paper (2007-2016).

NIM: Interest earned on assets minus interest paid on borrowed funds divided by the interest earning asset.

STD: Short term debt to total assets.

LTD: Long term debt to total assets.

DR: Total debt to total assets.

ER: Total Equity to total assets.

BSZ: Natural logarithm of total assets.

GR: Assets of current year minus assets of previous year by the assets of current year

In view of the above, this paper has proposed the following hypotheses:

H1: There is no relationship between STD and NIM

H2: There is no relationship between LTD and NIM

H3: There is no relationship between DR and NIM

H4: There is no relationship between ER and NIM

4. Results and discussion

The objective of this paper is to examine the relationship between capital structure and financial performance of listed banks in Nigeria. Thus, results of the analysis with the help of STATA (14) statistical software package are presented as follows:

4.1 Descriptive statistics of the data

Descriptive statistics enable transformation of raw data into more meaningful information (Sekaran, 2003). To describe data in this paper, descriptive statistics such as, mean, standard deviation, minimum and maximum were presented in Table 2.

Table 2: Descriptive Table (N=120)

Variable	Obs	Mean	Std. Dev	Min	Max
NIM	120	0.054	0.016	0.014	0.112
STD	120	0.675	0.117	0.073	0.879
LTD	120	0.171	0.107	0.033	0.815
DR	120	0.845	0.053	0.678	0.972
ER	120	0.153	0.051	0.028	0.298
GR	120	0.090	0.114	-0.184	0.497

BSZ	120	5.975	0.339	5.164	6.632
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Source: STATA (14) output, 2018

The descriptive statistics table shows the mean score of NIM is 0.054 for the sampled listed DMBs during the study period. This implies that, for every one naira invested in interest earning assets, listed DMBs earned about five (5) kobo out of it. The minimum NIM value recorded during this period was of 0.014 whereas 0.112 was its corresponding maximum value. Similarly, the standard deviation from the mean of NIM was 0.016. This shows that although some listed DMBs earned below average, there were some that earned about 12 kobo for every one naira invested in interest earning assets.

Looking at the independent variable the listed DMBs capital structure measured by STD, LTD, DR and ER, they have mean values of 0.675, 0.171, 0.845 and 0.153 respectively. The maximum values of 0.879, 0.815, 0.972, 0.298 and minimum values of 0.073, 0.033, 0.678 and 0.028 respectively were also found. Implying about 85 percent of the listed DMBs' capital structure was made of debt. Similarly, STD, LTD, DR and ER, deviate from their means on both sides by 0.117, 0.107, 0.053 and 0.051 respectively.

From the side of control variables, the mean score of GR for the study period was 0.090, a maximum value of 0.497 and the minimum value was -0.184. Likewise, the value of GR can deviate from its mean by 0.114. Finally, bank size (BSZ) has an average value of 5.975, while 5.164 and 6.632 values are for minimum and maximum respectively. BSZ can also deviate by 0.339.

4.2 Correlation matrix

To determine the association between the entire variables of the study, correlation matrix was obtained as presented in Table 2. Similarly, correlation can be used to determine the presence of multicollinearity among the independent variables.

Table 3: Correlation matrix(N=120)

	NIM	STD	LTD	DR	ER	GR	BSZ
NIM	1.0000						
STD	0.0519	1.0000					
LTD	-0.0440	-0.894*	1.0000				
DR	-0.0772	0.2527*	0.0489	1.0000			
ER	0.1047	-0.247*	-0.0294	-0.935*	1.0000		
GR	-0.441*	-0.316*	0.2851*	0.0288	-0.0559	1.0000	
BSZ	0.0647	0.1910*	-0.1157	0.1066	-0.0721	-0.217*	1.0000

Correlation at 5%*, significance level

Source: STATA (14) output, 2018

To determine the association among the variables of the study, correlation coefficients are obtained as presented in the correlation matrix table. The coefficients values revealed different levels of associations among the variables. For instance, net interest margin (NIM) exhibits a weak positive but insignificant association of 0.0519 with short term debt ratio (STD), negative insignificant correlation of -0.0440 with long term debt

ratio (LTD), a significant negative association of -0.0772 with debt ratio (DR). In contrast, the correlation between NIM and equity ratio (ER) is 0.1047 , suggesting a significant positive association. Similarly, the correlation matrix reveals that NIM has weak positive insignificant association of 0.0647 with bank size (BZ). Finally, a negative significant association of -0.4409 at 5 percent was found between growth prospects (GR) and NIM.

Similarly, the extent of correlation among the independent variables was measured by the coefficient values. When the correlation between two independent variables is very strong, it is known as multicollinearity. And the implication of multicollinearity is that the multiple regression analysis cannot be relied upon. Conventionally, a correlation of more than 0.8 or less than -0.8 between two independent variables is a sign of multicollinearity (Garson, 2012). Most of the coefficient values were less than 0.8 and more than -0.8 , with the exception of highest negative significant coefficient value of -0.9346 between debt ratio (DR) and equity ratio (ER). Similarly, the negative significant coefficient value of -0.8936 between STD and LTD was less than the required threshold value of -0.8 . Hence, the need to further ascertain the extent of multicollinearity as signalled by the high correlation values with more robust technique. For this reason, variance inflation factor (VIF) was used in the context of this paper to examine the multicollinearity between the independent variables. According to Pallant, (2011) only VIF values that are greater than 10 and $1/VIF$ (Tolerance value) below 0.1 should be a cause for concern.

Table 4: Variance Inflation Factor (VIF) Result

VARIABLE	VIF	1/VIF
STD2	9.35	0.1069
DR	8.92	0.1121
LTD	8.43	0.1186
ER	8.03	0.1345
GR	1.18	0.8502
BSZ	1.09	0.9171
MEAN VIF	6.17	

Source: STATA (14) output, 2018

The initial diagnostic test as indicated in the appendix has shown the presence of multicollinearity between STD, LTD and DR. To remedy the multicollinearity problem among the independent variables, one or more of the highly correlated variables must be transformed as suggested by Hairs, et al. (2010). Table 4 above, shows the VIF and $1/VIF$ values of the study variables, long term debt ratio (LTD), short term debt ratio (STD), debt ratio (DR), equity ratio (ER), bank growth (GR) and bank size (BSZ) are all within the recommended caveat after the transformation. This implies the absence of multicollinearity among these variables. Hence, the regression estimation can be relied upon.

4.3 Regression Result

As indicated in the methodology, the model was analysed using random effect techniques with an option of robust standard error. The result presents R- squared value of 0.1907 for model, this indicates that capital structure indicators combined together with the control variables explained 19.07 % of the variability of listed DMBs' financial performance (NIM). The Wald test value of 19682.04 for the model is significant at 5% and this provides an indication that this model is statistically fit to explain the listed banks' financial performance (NIM) in Nigeria. The result is consistent with the findings of prior studies in Nigeria (for example Sadiq, Kachollom, Dasuki and Yusuf, 2017; Shaba, Yaaba and Ibrahim, 2016) and inconsistent with the findings of Anarfo (2015).

Table 4: Random Effect Estimation Results

NIM	Coeff.	Robust Std. Err.	Z	P> Z 	Significance
STD	-0.0063	0.0155	-0.41	0.684	
LTD	-0.0126	0.0525	-0.24	0.811	
DR	0.1002	0.0364	2.76	0.006	*
ER	0.1336	0.0268	4.99	0.000	*
GR	-0.0587	0.0102	-5.78	0.000	*
BSZ	0.0007	0.0042	0.18	0.854	
CONS	-0.0507	0.0298	-1.70	0.089	
Observations		120			
R²		0.1907			
Wald X²		19682.04		0.000	*
Hausman (X²>5%)		1.87		0.9316	
Number of DMBs		12			

Source: STATA (14) Output, 2018

Note: * Significant at 5% level of Significance

Concerning the influence of each of the capital structure indicator with the NIM, the result found both STD and LTD have negative non significant relationship of (Coeff= -0.0063; P<z=0.684) and (Coeff= -0.0126; P<z=0.811) respectively. Going by the findings, the null hypotheses (H1 and H2) are accepted. This implies that an increase in STD or LTD has no significant relationship with a decrease in NIM and vice versa. The findings are consistent with Anarfo (2015). The remaining metrics DR and ER were however found to have positive and significant relationship of (Coeff= 0.1002; P<z=0.006) and (Coeff= 0.1336; P<z=0.000) with NIM respectively. With these results null hypotheses (H3 and H4) are rejected. Meaning, DR and ER are statistically determinants of NIM in this period. This finding is in line with the result of prior studies in Nigeria (for example Sadiq et al., 2017 and Shaba et al, 2016). Looking at the bank specific control variables, GR has a negative significant relationship (Coeff= -0.0587; P<z=0.000). Growth in assets should have exhibit a positive relationship with financial

performance. However, the negative result could be as a result of accumulated nonperforming or idle assets that these DMBs have, hence any increase in the GR could possibly erode their financial performance. BSZ posts a non-significant positive relationship (Coeff= 0.0007; $P < z = 0.0854$). The finding suggests economies of scale do not play an important role in enhancing the NIM of listed banks in Nigeria in this period.

5. Conclusion and Recommendations

The study assessed the relationship of capital structure on the Nigerian bank's financial performance. In view of this, the study observed that about 85% of the total capital of banks in Nigeria during the period of this study was made up of debt. This is reaffirmation of the fact that banks are highly levered financial institutions. The study found that capital structure indicators are good predictors of listed banks' financial performance in Nigeria as evidence by the significant wald test value of less than 5 percent. Based on the findings obtained, the following recommendations are hereby offered.

- i. The result implies that profitable DMBs do not rely solely on STD to finance their assets nor LTD. Therefore, bank management should consider a tradeoff between STD and LTD in making decision about capital structure in order to optimize their financial performance.
- ii. Similarly, bank management should give more incentives to STD suppliers especially the depositors; this will motivate them to allow their deposits to stay with DMBs for a longer period than the present practice. The adjustment in maturity structure of STDs will provide DMBs with additional assets financing vehicle that could possibly enhance their performance. In addition, DMBs should desist from employing LTD only since it has a negative implication to their performance.
- iii. Total debt (DR) is a significant determinant of listed banks' financial performance and thus due diligence needs to be undertaken whenever bank decides to borrow funds for investment. This will ensure that managerial discipline enforced by debt on managers' performance may not be outweighed by financial distress envisaged from excessive leverage.
- iv. Equity contribution to net interest margin of the sampled listed DMBs is higher than debt contribution. This may not be unconnected with the high fixed interest obligation rooted with debt financing. Instead of over relying on debt financing as observed in descriptive matrix, banks managements should place emphasis on equity to finance their planned growth due to absence of fixed interest obligation.
- v. There is need for the government to formulate policies that will fast track the development of a more vibrant capital market where DMBs and other firms will have access to equity and bond at global competitive rates. This will go a long

way in discouraging Nigerian firms from going offshore to seek financing opportunities and at the same time woos foreign investors to Nigerian capital market.

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APPENDICES

```

qui reg nim std ltd dr er gr bsz
. vif
-----+-----
Variable |          VIF          1/VIF
-----+-----
      std |       72315.33         0.000014
      ltd |       60412.54         0.000017
      dr  |       14853.48         0.000067
      er  |         8.04         0.124407
      gr  |         1.14         0.876591
      bsz |         1.07         0.931220
-----+-----
Mean VIF |       24598.60
. kdensity std, norm
. gen std2=log(std)
.
. qui reg nim std2 ltd dr er gr bsz
. vif
-----+-----
Variable |          VIF          1/VIF
-----+-----
      std2 |         9.35         0.106936
      dr   |         8.92         0.112154
      ltd  |         8.43         0.118593
      er   |         8.03         0.124541
      gr   |         1.18         0.850262
      bsz  |         1.09         0.917133
-----+-----
Mean VIF |         6.17
.
. hettest
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of nim

      chi2(1)      =       7.28
      Prob > chi2  =       0.0070
. ovtest
Ramsey RESET test using powers of the fitted values of nim
Ho: model has no omitted variables
      F(3, 110) =       0.45
      Prob > F  =       0.7206
. xtserial nim std2 ltd dr er gr bsz
Wooldridge test for autocorrelation in panel data
Ho: no first-order autocorrelation
      F( 1,      11) =       7.632
      Prob > F  =       0.0185

```



```
. xtreg nim std2 ltd dr er gr bsz, re
```

```
Random-effects GLS regression
Group variable: code
```

```
Number of obs   =    120
Number of groups =    12
```

```
R-sq:
```

```
  within = 0.2997
  between = 0.0099
  overall = 0.1907
```

```
obs per group:
  min =    10
  avg =   10.0
  max =    10
```

```
corr(u_i, x) = 0 (assumed)
```

```
wald chi2(6) =    44.17
Prob > chi2 =    0.0000
```

nim	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
std2	-.0063227	.0141925	-0.45	0.656	-.0341394	.021494
ltd	-.0125597	.0375556	-0.33	0.738	-.0861675	.061048
dr	.1002166	.0663518	1.51	0.131	-.0298305	.2302637
er	.1336198	.0664601	2.01	0.044	.0033604	.2638792
gr	-.0587544	.0110793	-5.30	0.000	-.0804694	-.0370394
bsz	.0007742	.0051687	0.15	0.881	-.0093562	.0109046
_cons	-.0507595	.074932	-0.68	0.498	-.1976236	.0961046
sigma_u	.01021284					
sigma_e	.01212694					
rho	.41494321	(fraction of variance due to u_i)				

. hausman fixed

	---- Coefficients ----		(b-B)	sqrt(diag(V_b-V_B))
	(b)	(B)	Difference	S.E.
	fixed	.		
std2	-.0091533	-.0063227	-.0028306	.0044384
ltd	-.0222883	-.0125597	-.0097286	.0139383
dr	.1183557	.1002166	.0181391	.0157579
er	.1526144	.1336198	.0189946	.0173145
gr	-.0567014	-.0587544	.002053	.0027485
bsz	.0022759	.0007742	.0015017	.0027514

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\chi^2(6) = (b-B)'[(V_b-V_B)^{-1}](b-B) = 1.87$$

Prob>chi2 = 0.9316

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

$$nim[code,t] = Xb + u[code] + e[code,t]$$

Estimated results:

	Var	sd = sqrt(var)
nim	.0002625	.0162033
e	.0001471	.0121269
u	.0001043	.0102128

Test: Var(u) = 0

$$\text{chibar2}(01) = 48.61$$

Prob > chibar2 = 0.0000

. xtreg nim std2 ltd dr er gr bsz, re robust

Random-effects GLS regression
 Group variable: code

Number of obs = 120
 Number of groups = 12

R-sq:

within = 0.2997
 between = 0.0099
 overall = 0.1907

obs per group:

min = 10
 avg = 10.0
 max = 10

corr(u_i, X) = 0 (assumed)

wald chi2(6) = 19682.04
 Prob > chi2 = 0.0000

(Std. Err. adjusted for 12 clusters in code)

nim	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
std2	-.0063227	.0155269	-0.41	0.684	-.0367548 .0241094
ltd	-.0125597	.0525366	-0.24	0.811	-.1155295 .09041
dr	.1002166	.0363727	2.76	0.006	.0289273 .1715059
er	.1336198	.026778	4.99	0.000	.0811359 .1861037
gr	-.0587544	.0101674	-5.78	0.000	-.0786822 -.0388266
bsz	.0007742	.0041938	0.18	0.854	-.0074456 .008994
_cons	-.0507595	.0298677	-1.70	0.089	-.1092992 .0077802
sigma_u	.01021284				
sigma_e	.01212694				
rho	.41494321	(fraction of variance due to u_i)			

VARIABLES OF THE STUDY

SN	CODE	YEAR	std	ltd	dr	er	bsz	gr	nim
1	1	2007	0.624	0.289	0.913	0.086	5.517	0.275	.036
2	1	2008	0.341	0.492	0.833	0.167	6.014	0.497	.025
3	1	2009	0.601	0.125	0.726	0.274	5.829	-0.184	.068
4	1	2010	0.606	0.143	0.749	0.251	5.862	0.032	.055
5	1	2011	0.553	0.251	0.804	0.196	5.976	0.114	.051
6	1	2012	0.722	0.121	0.843	0.157	6.181	0.205	.059
7	1	2013	0.714	0.142	0.856	0.144	6.231	0.051	.039
8	1	2014	0.668	0.193	0.862	0.138	6.297	0.066	.045
9	1	2015	0.634	0.217	0.851	0.149	6.382	0.085	.037
10	1	2016	0.586	0.278	0.864	0.136	6.491	0.108	.037
11	2	2007	0.678	0.150	0.827	0.173	5.495	0.146	.051
12	2	2008	0.669	0.137	0.806	0.194	5.781	0.286	.038
13	2	2009	0.683	0.138	0.821	0.179	5.814	0.033	.062
14	2	2010	0.691	0.096	0.787	0.213	5.739	-0.074	.09
15	2	2011	0.763	0.119	0.882	0.118	5.854	0.115	.097
16	2	2012	0.777	0.122	0.899	0.101	6.025	0.171	.08
17	2	2013	0.807	0.091	0.898	0.102	6.132	0.107	.073
18	2	2014	0.774	0.108	0.882	0.118	6.243	0.111	.058
19	2	2015	0.692	0.175	0.866	0.134	6.192	-0.051	.065
20	2	2016	0.683	0.190	0.873	0.127	6.221	0.029	.058
21	3	2007	0.073	0.815	0.888	0.112	5.493	0.372	.043
22	3	2008	0.718	0.208	0.927	0.073	5.636	0.143	.043
23	3	2009	0.686	0.108	0.793	0.207	5.551	-0.085	.065
24	3	2010	0.752	0.088	0.840	0.164	5.655	0.104	.063
25	3	2011	0.793	0.146	0.938	0.062	6.042	0.387	.026
26	3	2012	0.787	0.097	0.884	0.116	6.122	0.080	.046
27	3	2013	0.766	0.127	0.893	0.107	6.165	0.042	.061
28	3	2014	0.706	0.182	0.888	0.112	6.249	0.084	.056
29	3	2015	0.679	0.195	0.873	0.127	6.254	0.005	.069
30	3	2016	0.623	0.255	0.878	0.122	6.257	0.003	.069
31	4	2007	0.763	0.136	0.899	0.101	5.882	0.150	.05
32	4	2008	0.568	0.141	0.708	0.292	6.066	0.184	.049
33	4	2009	0.643	0.147	0.789	0.211	6.222	0.156	.052
34	4	2010	0.678	0.146	0.824	0.176	6.293	0.071	.058
35	4	2011	0.724	0.124	0.848	0.152	6.392	0.099	.072
36	4	2012	0.784	0.082	0.866	0.134	6.443	0.051	.074
37	4	2013	0.792	0.100	0.892	0.108	6.511	0.069	.064
38	4	2014	0.731	0.148	0.879	0.121	6.543	0.032	.062
39	4	2015	0.720	0.142	0.862	0.138	6.523	-0.020	.068
40	4	2016	0.700	0.163	0.863	0.137	6.551	0.028	.073
41	5	2007	0.715	0.167	0.882	0.118	5.420	0.392	.036
42	5	2008	0.541	0.175	0.716	0.284	5.668	0.248	.044
43	5	2009	0.627	0.125	0.752	0.248	5.711	0.044	.072
44	5	2010	0.632	0.114	0.746	0.254	5.724	0.013	.036
45	5	2011	0.692	0.110	0.802	0.198	5.773	0.049	.047

46	5	2012	0.711	0.143	0.855	0.145	5.958	0.185	.048
47	5	2013	0.709	0.148	0.857	0.143	6.004	0.045	.056
48	5	2014	0.628	0.235	0.863	0.137	6.068	0.064	.062
49	5	2015	0.604	0.256	0.860	0.140	6.064	-0.004	.055
50	5	2016	0.561	0.287	0.847	0.153	6.069	0.005	.059
51	6	2007	0.814	0.049	0.863	0.137	5.337	0.258	.041
52	6	2008	0.712	0.033	0.745	0.255	5.727	0.390	.041
53	6	2009	0.665	0.037	0.702	0.298	5.638	-0.089	.03
54	6	2010	0.685	0.034	0.719	0.281	5.679	0.042	.055
55	6	2011	0.759	0.057	0.816	0.184	5.869	0.189	.039
56	6	2012	0.784	0.040	0.823	0.177	5.961	0.092	.04
57	6	2013	0.746	0.103	0.849	0.151	6.034	0.073	.028
58	6	2014	0.691	0.163	0.854	0.146	6.074	0.041	.041
59	6	2015	0.625	0.226	0.851	0.149	6.091	0.016	.049
60	6	2016	0.611	0.246	0.857	0.143	6.113	0.023	.048
61	7	2007	0.608	0.293	0.901	0.099	5.680	0.195	.038
62	7	2008	0.485	0.319	0.804	0.196	5.963	0.283	.05
63	7	2009	0.649	0.166	0.815	0.185	6.009	0.046	.072
64	7	2010	0.668	0.140	0.808	0.192	6.028	0.020	.071
65	7	2011	0.632	0.213	0.845	0.155	6.183	0.155	.064
66	7	2012	0.651	0.173	0.823	0.177	6.210	0.026	.076
67	7	2013	0.663	0.164	0.827	0.173	6.280	0.070	.067
68	7	2014	0.677	0.154	0.831	0.169	6.328	0.048	.061
69	7	2015	0.625	0.197	0.822	0.178	6.357	0.030	.064
70	7	2016	0.646	0.172	0.818	0.182	6.417	0.060	.065
71	9	2007	0.238	0.524	0.762	0.238	5.484	0.439	.031
72	9	2008	0.286	0.492	0.778	0.222	5.539	0.055	.063
73	9	2009	0.514	0.259	0.773	0.227	5.521	-0.018	.073
74	9	2010	0.503	0.288	0.792	0.208	5.571	0.050	.069
75	9	2011	0.546	0.317	0.863	0.137	5.734	0.163	.053
76	9	2012	0.564	0.309	0.873	0.127	5.830	0.096	.05
77	9	2013	0.613	0.259	0.872	0.128	5.883	0.052	.049
78	9	2014	0.588	0.284	0.872	0.128	5.974	0.091	.05
79	9	2015	0.628	0.234	0.862	0.138	5.972	-0.002	.047
80	9	2016	0.584	0.283	0.866	0.134	6.023	0.051	.055
81	10	2007	0.733	0.084	0.816	0.184	5.164	0.124	.042
82	10	2008	0.781	0.091	0.872	0.128	5.374	0.210	.05
83	10	2009	0.780	0.112	0.892	0.108	5.313	-0.061	.061
84	10	2010	0.768	0.131	0.899	0.101	5.414	0.101	.056
85	10	2011	0.806	0.113	0.919	0.081	5.703	0.289	.029
86	10	2012	0.805	0.115	0.920	0.080	5.764	0.061	.041
87	10	2013	0.806	0.104	0.910	0.090	5.850	0.086	.051
88	10	2014	0.796	0.102	0.897	0.103	5.916	0.066	.052
89	10	2015	0.739	0.141	0.880	0.120	5.903	-0.013	.049
90	10	2016	0.686	0.211	0.897	0.103	5.919	0.017	.014
91	11	2007	0.814	0.036	0.850	0.150	6.042	0.112	.038

92	11	2008	0.828	0.049	0.876	0.124	6.182	0.140	.047
93	11	2009	0.822	0.044	0.866	0.134	6.146	-0.035	.077
94	11	2010	0.781	0.088	0.869	0.131	6.156	0.010	.044
95	11	2011	0.730	0.160	0.891	0.109	6.222	0.066	.034
96	11	2012	0.756	0.130	0.886	0.114	6.286	0.065	.039
97	11	2013	0.811	0.072	0.883	0.117	6.346	0.060	.034
98	11	2014	0.775	0.105	0.879	0.121	6.369	0.023	.035
99	11	2015	0.734	0.113	0.847	0.153	6.346	-0.023	.048
100	11	2016	0.669	0.177	0.846	0.154	6.405	0.059	.043
101	13	2007	0.717	0.125	0.842	0.158	5.308	0.191	.03
102	13	2008	0.879	0.069	0.948	0.052	5.561	0.253	.046
103	13	2009	0.837	0.135	0.972	0.028	5.410	-0.152	.065
104	13	2010	0.577	0.101	0.678	0.115	5.586	0.176	.043
105	13	2011	0.714	0.167	0.881	0.119	5.573	-0.013	.056
106	13	2012	0.682	0.188	0.870	0.130	5.597	0.025	.064
107	13	2013	0.751	0.179	0.930	0.070	5.606	0.009	.075
108	13	2014	0.670	0.145	0.815	0.185	5.616	0.010	.112
109	13	2015	0.522	0.292	0.814	0.186	5.647	0.030	.097
110	13	2016	0.536	0.295	0.831	0.169	5.693	0.046	.1
111	15	2007	0.643	0.230	0.872	0.128	5.946	0.162	.049
112	15	2008	0.691	0.107	0.799	0.201	6.225	0.279	.052
113	15	2009	0.706	0.085	0.791	0.209	6.197	-0.029	.066
114	15	2010	0.721	0.084	0.804	0.196	6.253	0.056	.047
115	15	2011	0.727	0.101	0.828	0.172	6.336	0.084	.056
116	15	2012	0.739	0.081	0.820	0.180	6.387	0.051	.061
117	15	2013	0.723	0.113	0.836	0.164	6.459	0.072	.065
118	15	2014	0.662	0.189	0.850	0.150	6.535	0.075	.054
119	15	2015	0.622	0.232	0.854	0.146	6.574	0.040	.054
120	15	2016	0.596	0.260	0.856	0.144	6.632	0.058	.049

Code Bank Name

1. Accesss Bank
2. Diamond Bank
3. Ecobank
4. FBN
5. FCMB
6. Fidelity Bank
7. Gtbank
8. Skye Bank ***
9. Stanbic IBTC
10. Sterling Bank
11. UBA
12. Union Bank ***
13. Unity Bank
14. Wema Bank ***
15. Zenith Bank

*** These banks were excluded from the analysis.