

Capital Structure and Profitability of Deposit Money Banks: Empirical Evidence from Nigeria

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Abstract

The banking sector consolidation exercise that took place in Nigeria in 2005 did not only reduce the number of Deposit Money Banks (DMBs) but diversified their capital structure and adjusted their regulatory capital requirements. Given these developments, it is imperative that the DMBs determine the most optimal financing mix which minimises the cost of financing as well as maximises returns. This study empirically examined the impact of capital structure (owners' funds and borrowed funds) on bank profitability 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. Consistent with the agency and static trade-off theories of capital structure and earlier empirical findings in Nigeria, the results further found evidence of a positive and significant influence of both owners' and borrowed funds on profitability. However, borrowed funds was found to be more prevalent in enhancing the performance of DMBs during the study period. Following these findings therefore, the study recommends that DMBs should study and understand the dynamics of capital structure to enable them make optimal capital mix decision. In addition, since debt is more critical in boosting profitability of banks in Nigeria, DMBs should employ more debt than equity in financing real investment with positive net present values. The management and board of directors of DMBs should incentivise lenders and depositors so as to enhance easy access to funds other than shareholders'. Additional incentives on depositors' and creditors' funds such as increase in their returns are capable of attracting more funds from the investing public to create assets.

Key Words: Capital Structure, Owners' Funds, Borrowed Funds, Gross Earnings, Deposit Money Banks, Nigeria

1.0 Introduction

The banking sector consolidation exercise that took place in Nigeria in 2005 did not only lead to reduction in number of Deposit Money Banks (DMBs) but also diversified their capital structure. While the total number reduced from 89 to 25, shareholders' funds grew sporadically from an average of sixty-two billion naira (₦62bn) to seventy-three billion naira (₦73bn) (Central Bank of Nigeria, CBN, 2005). Conversely, borrowed funds plummeted from an average of sixty-five billion naira (₦65bn) in 2004 to forty-seven billion naira (₦47bn) in 2005. Consequently, the regulatory capital requirement affected mainly the shareholders' funds and by implication tied down a sizeable component of these funds. Thus, in most cases, owners of banks resorted to borrowed funds to finance their activities.

With the increase in owners' funds, the CBN adjusted the regulatory capital requirements of banks such that Tier 1 for instance, increased from 8.0 per cent as provided by the Basel II Accord to 10.0 per cent for banks that operate within Nigeria. Whilst banks that have international presence were required to have Tier 1 capital at 15.0 per cent, the systemically important banks were urged to keep Tier 1 capital at 16.0 per cent (CBN, 2010).

The change in the capital structure as well as prudent regulatory capital requirement notwithstanding, some of the DMBs still experienced liquidity squeeze in 2009 leading to intervention by the CBN. The CBN injected six hundred and twenty billion naira (₦620bn) into 3 banks (Platinum Habib Bank Plc, Afribank Bank Plc & Spring Bank Plc) in form of Tier 2 capital and thereafter nationalised them. The intervention was considered as the saving grace for the affected banks. However, it is imperative that the players (DMBs) determine the most optimal financing mix which minimizes the cost of financing as well as maximizes returns for the banks.

To this effect therefore, analysts and policy makers have expressed divergent opinions as to which of the components of capital available to DMBs boost their profitability. In literature, three differing views have been put forward by scholars of corporate finance: First, a positive relationship between high equity-to-debt ratio and firm profitability such that firms depend more on owners' funds than borrowed funds. The second is a relationship between high debt-to-equity ratio and firm profitability such that firms rely heavily on borrowed funds relatively to owners' funds. The last scenario depicts a middle position between owners' funds and borrowed funds. The applicability of any given scenario at any particular point in time, however, depends largely on the cost of financing particularly of the borrowed funds. This study is an attempt to empirically examine the component of capital that is critical to profitability of DMBs in Nigeria.

To achieve this objective, the study is divided into five sections. After this brief introduction is section two which considers the literature review. Section three details the methodology and data used for the estimation while section four discusses the results. Section five concludes the results and proffers some policy implications.

2.0 Literature Review

This section is divided into two – theoretical and empirical reviews. Whilst the former reviews theories underpinning capital structure, the latter reviews scholarly works on the subject within and outside Nigeria.

2.1 Theoretical Review

The best combination of capital (optimal mix of debt and equity) is one of the most critical financial decisions for any firm because of its impact on shareholders' risk and return. Such decisions are taken not only to maximise shareholder wealth, but also to make certain the firm's capacity to cope with the uncertain, volatile, versatile and competitive business environment.

The root of capital structure theory dates back to the seminal work of Modigliani and Miller (1958). The authors argued that the value of the firm is not dependent on its financial structure. Put slightly differently, the value of a levered firm equals the value of an unlevered firm. Recognising the effects of benefits of tax shield of debt, Modigliani and Miller (1963) relaxed their assumptions of no taxes and transactions costs on the ground that debt can reduce the payment obligations related to corporate tax as this minimises the weighted average cost of capital and maximises firm performance and value. The validity of these claims according to Tudose (2012) is verified only in the context of their assumptions which characterise an ideal situation. Nevertheless, today, their pioneer works serve as the starting point and the foundation of modern finance.

In the 1960s to the 1970s, corporate finance scholars (see Kraus & Litzenberger, 1973; Miller, 1977; Scott, 1977; Kim, 1978) rekindled and modified the debate towards examining the way in which firms manage to balance the bankruptcy costs with the benefits of tax shields derived from leverage. For instance, Miller (1977) hypothesised that the optimal leverage ratio of the firm is determined by the trade-off between current tax shield benefits of debt and higher bankruptcy costs implied by the higher degree of corporate indebtedness. It assumes that firms balance the marginal present values of interest tax shields against the costs of financial distress. The works of Kraus and Litzenberger (1973), Miller (1977), Scott (1977) and Kim (1978) among others were later grouped under the static trade-off theory whose underlying claim is that firms set a target debt ratio which they attempt to reach in order to maximise shareholders return. In other words, the theory argues that a firm substitutes debt for equity or equity for debt until the value of the firm is maximized. Graham and Harvey (2001) and Desai (2007) however argued that the tax advantage is more critical for large, regulated and dividend-paying firms, that is, firms that probably have high corporate tax rates enjoy large tax incentives to use debt. This theory assumes a positive relationship between a firm's leverage and performance.

In the mid 1970s, research efforts shifted to agency costs, focusing on two categories of conflicts of interest between managers and shareholders, on one hand, and creditors and shareholders, on the other (Jensen & Meckling, 1976). The former arises when shareholders fail to monitor the activities of managers. Thus, the theory assumes that in the presence of information asymmetry, the agent (in this case, the directors and managers) is likely to pursue interests and preferences that may be detrimental to the principal or owner (Fama, 1980). Corporate finance scholars have however argued that higher leverage can mitigate conflicts between shareholders and managers regarding the amount of risk a firm undertakes (see Jensen and Meckling, 1976) and the choice of investment it makes (see Myers, 1977).

The latter arises from debt contract that makes shareholders invest sub-optimally. This is based on the assumption that optimal capital structure represents a compromise between the effects of interest tax shield, financial distress costs and agency costs (Tudose, 2012). However, Jensen (1986) argues that there are two main

advantages a levered firm enjoys. The first is the tax shield. Usually, interest on debt is non-tax deductible and profits realised from the use of it are taxed lower, hence, it is expected that debt would help in raising the value of the firm. The second benefit is derived from the use of debt to discipline managers. Besides, the law usually guarantees a right of partial information disclosure to the company's debt holders, which serves as additional managers' supervision tool. Consequently, company managers become more transparent and have more incentives to create higher value for the equity owners which Jensen (1986) argued is the essence of free cash flow theory of capital structure.

Drawing from the above, the agency cost theory proposed by Jensen and Meckling (1976) predicts a positive relationship between debt and profitability. In fact, large creditors have interest in seeing that managers take performance-improving mechanisms. These mechanisms according to Jensen & Meckling (1976) include among others; monitoring by debt holders; managers' fear of bankruptcy and liquidation following misuse of funds, which may lead to loss of jobs, reputation and salaries; untimely termination of debt agreement by the creditor; and reduction of over-investments. Thus, it is expected that as debt increases in the context of low agency costs, the level of efficiency will increase thereby raising firm performance. Berger and Bonaccorsi di Patti (2006) argue that higher leverage or a lower equity capital ratio is associated with higher profit efficiency, a finding that is consistent with agency theory. In good times, higher level of leverage profits the shareholders more than the creditors, but this does not hold when performance is very low. In fact, when performance gets to a certain level and the firm moves towards insolvency, shareholders face the risk of losing only their investments thereby passing the risk to the creditors especially in Nigeria where there are weak legal and regulatory environments.

Ross (1973) considered the choice of debt within the signalling theory framework and found that firms with lower expected cash flows secure debt at a higher cost. Consequently, when the firm secures new debt, it commits itself to future interest payments and signals about its stable financial position and ability to make these payments in the future. Similarly, Demsetz (1973) and Berger and Bonaccorsi di Patti (2006) used the efficiency-risk hypothesis to argue that higher efficiency of the firm reduces expected costs of bankruptcy, and such firms may attract more debt. On the other hand, according to the franchise value hypothesis, more efficient firms would like to protect economic rent derived from their efficiency, and might choose lower leverage.

Myers (1984) and Myers and Majluf (1984), in the 1980s, developed the pecking-order theory otherwise known as the asymmetric information model. This development refocused research thinking towards information asymmetry among investors and firms. The theory postulates that there is a hierarchy in the firm's preference for financing investments and that compliance with the hierarchy represents the optimal financial structure. Thus, firms prefer internal to external financing, although, they would embrace the latter if necessary to finance real investment with positive net present values. Since issuing new shares is detrimental to existing shareholders' interest, managers will prefer to finance investments from internal source (i.e. retained earnings); if this source proves insufficient, they will then opt for external sources (first, by less risky debt, followed by risky debt, and then equity). The theory postulates a negative relationship between debt financing and firm performance. Accordingly, more profitable firms earn higher return that can in turn be retained making them opt for lower amount of debt as against less profitable companies who do not enjoy same and are therefore compelled to employ more debt in order to finance ongoing activities.

In extant literature, various firm level and industry specific characteristics are critical determinants of capital structure of firms. These characteristics according to Chechet and Olayiwola (2014) include firm age, firm size, firm risk, asset structure, profitability, growth, tax and ownership structure. Harris and Raviv (1991) earlier contended that most of the studies concur that leverage increases with fixed assets, non-debt tax shields, growth opportunities, firm size and decreases with volatility, advertising expenditures, research and development costs, bankruptcy probability, profitability and uniqueness of the product. For instance, McConnell and Servaes (1995) found that whereas negative effect of leverage on performance tends to exist for high-growth firms, the opposite situation occurs for firms with low investment opportunities.

2.2 Empirical Literature Review

This subsection discusses some empirical studies, which examined the impact of capital structure on firm performance. The subsection is divided into three: the first presents past studies that indicate a positive relationship; the second shows a negative correlation while the last displays mixed results.

2.2.1 Capital Structure and Firm Performance: A Positive Relationship

Idode, Adeleke, Ogunlowore and Ashogbon (2014) examine the influence of capital structure on profitability of Nigerian banks from 2008 to 2012 using ex-post-factor research design and multiple regression technique. The

study employs return on assets (ROA) measured as earnings before taxes (EBT) divided by total assets as a measure of bank performance and total debt to total assets ratio and total equity to total assets ratio as independent variables. The findings show that capital structure has a significant positive influence on profitability of Nigerian banks. On the basis of this finding, the study recommends that directors and management should use both equity and debt in financing their business activities as supported by the pecking order and agency theories.

Similarly, Adesina, Nwidobie and Adesina (2015) examine the impact of post-consolidation capital structure on the financial performance of 10 Nigerian banks for the period 2005 through 2012. The study which employed profit before tax as a dependent variable, equity and debt as independent variables and Ordinary Least Squares as a regression technique shows that capital structure has a significant positive relationship with the profitability of Nigerian quoted banks. The authors suggest among others the use of debt and equity capital in financing Nigerian banks to improve earnings.

2.2.2 Negative Relationship between Capital Structure and Firm Performance

In contrast to the above, most studies provide evidence of significant negative impact of capital structure on firm performance. For instance, Soumadi and Hayajneh (2010) investigate the effect of capital structure on performance of 76 (53 industrial and 23 service) out of 129 firms listed on the Amman Stock Exchange of Jordan for the period 2001 through 2006. The study which employs financial leverage, tangible assets and firm growth as proxies for capital structure (independent variables); return on equity and Tobin's Q as measures of firm performance; firm size as a control variable, uses multiple regression model represented by Ordinary Least Squares (OLS). The study which also excludes financial services firms because of their capital structure characteristics provides evidence of a significant negative relationship between capital structure and performance of both classes of firms. The results which also revealed significant negative impact of capital structure on performance of high and low levered firms and high and low growth firms, showed no significant differences between the performances of high and low levered firms and high and low growth firms.

In an attempt to investigate the impact of capital structure on bank performance, Awunyo-Vitor and Badu (2012) empirically examine the relationship between capital structure and performance of 7 listed Ghanaian banks from 2000 to 2010. The authors employ debt to equity ratio as an independent variable; return on assets, return on equity and Tobin's Q as proxies for bank performance and firm size, firm age, current liability and board size as control variables. The study which uses panel regression methodology revealed that the sampled banks are highly levered and this is significantly negatively related to their return on equity and Tobin's Q. The study also showed an insignificant negative impact of capital structure on return on assets. The authors attributed these findings to the banks' over-dependence on short-term debt which gives rise to high bank lending rate and low level of bond market activities. The study recommends among others the need for Ghanaian listed banks to rely more on internally generated funds to finance their activities and that where debt would be used, the banks should search for low interest-bearing ones so that the tax shield benefit of the loan will exceed the financial distress associated with it. The authors also suggest that regulatory authorities liaise with other stakeholders in the financial sector to develop an efficient bond market so that banks can raise long-term debt to avoid overreliance on short-term debt and that the authorities should also reconsider increase in tax relief as this is likely to enable the banks to have enough profit after tax that would increase retained earnings to improve internal investment.

In an effort to contribute to empirical literature, Iavorskyi (2013) investigates the impact of capital structure (debt-to-assets ratio) on performance (return on assets, return on sales and total factor productivity) of 16,500 Ukrainian firms between 2001 and 2010. Institutional factors such as firm size, industry and exit/entry were also used. The study which hypothesised that financial leverage positively affects firm activity through disciplining of managers, tax shield and signalling effects, uses Least Square Dummy Variable Regression with robust standard errors in order to capture fixed effects and address possible heteroskedasticity issues. The findings reveal a negative relationship between leverage and firm performance, a finding which is in disagreement with the free-cash-flow or the trade-off theory of capital structure but in support of the hypothesis of the pecking-order theory.

Opoku, Audu and Anarfi (2013) employ a panel data methodology to understudy the impact of capital structure on profitability of 9 listed banks on the Ghanaian Stock Exchange over the period 2005 through 2012 using capital structure theories as theoretical foundation. The study which examined the impact of total leverage, debt to equity ratio, total liabilities, bank size and age on return on assets, return on equity, Tobin's Q and economic value added (EVA) revealed that 76 per cent of the total capital of banks in Ghana is made up of debt with 75 per cent constituting both short-term debt and long-term debt consistent with earlier findings that Ghanaian banks

are highly geared. The findings also showed a negative relation between leverage and profitability amongst the listed banks. The negative influence of bank size on profitability suggests that larger banks tend to exhibit lower profits in line with models that emphasize the negative role of size from scale inefficiencies. The study therefore recommended that Ghanaian listed banks should make optimal use of resources at their command in order to boost profitability.

Akeem, Terer, Kiyanjui and Kayode (2014) while examining the impact of capital structure on performance of 10 randomly selected companies quoted on the Nigerian Stock Exchange use Generalised Least Squares Regression to analyse secondary data from 2003 to 2012. The study which uses total debt to asset ratio, total debt to equity ratio and long-term debt to capital ratio as capital structure variables and firm age as a control variable reveal a negative influence of capital structure on firm performance proxied by return on investment and return on asset. The study recommends that firms should employ more of equity than debt in financing their business activities. It also suggests the need for firms to establish the point at which the weighted average cost of capital is minimal.

2.2.3 Capital Structure and Firm Performance: A Review of Mixed Findings

At the other spectrum, other studies on capital structure and firm performance provide evidence of mixed relationships. Below is the review of such studies.

Olokoyo (2012) investigates the overall impact of capital structure (leverage) on performance (return on assets, return on equity and Tobin's Q) of 101 firms listed on the Nigerian Stock Market from 2003 through 2007. The study, which employs panel data analysis by using Fixed-effect estimation, Random-effect estimation and Pooled Regression Model, reveals that a firm's leverage have a significant negative impact on its accounting performance measure (ROA) and that all the leverage measures have a positive and highly significant relationship with the market performance measure (Tobin's Q). The study establishes that Nigerian firms are either majorly financed by equity capital or a mix of equity capital and short term debt. The study further shows that the maturity structure of debts affects the performance of firms significantly and that the size of the firm has a significant positive effect on its performance. The study recommends that Nigerian firms should try to match their high market performance with real activities that can help make the market performance reflect on their accounting performance and internal growth.

Velnampy and Niresh (2012) investigate the relationship between capital structure and profitability of ten listed Sri Lankan banks over the period, 2002 through 2009 using descriptive statistics and Pearson Product Correlation techniques. The study employs debt to equity and debt to total funds as measures of capital structure and net profit, return on capital employed, return on equity and net interest margin as proxies for firm performance. The findings reveal a negative association between capital structure and profitability except the association between debt to equity and return on equity which is positive but insignificant. However, while debt to equity is significantly negatively correlated with net interest margin, debt to total funds is found to be significantly negatively correlated with net profit and net interest margin. The results further suggest that 89 per cent of total assets in the Sri Lankan banking sector are represented by debt, confirming the hypothesis that banks are highly levered institutions. The authors posit that the outcomes of the study may guide banks, loan-creditors and policy planners to formulate better capital structure policy decisions.

Addae, Nyarko-Baasi and Hughes (2013) employ panel data methodology approach to investigate the relationship between capital structure and profitability of 34 out of 35 listed firms in Ghana for a five year period (2005-2009) using a performance measure - return on equity (ROE), three capital structure ratios - short-term debt to total capital; long-term debt to total capital and total debt to total capital and two control variables - logarithm of sales and sales growth. The authors also examined whether or not Ghanaian quoted firms depended on debt. The results revealed a statistically significant positive relationship between profitability and short-term debt and a significantly negative relationship between profitability and long term-debt. The results however revealed a statistically significant negative relationship between profitability and total debt. The results also showed that Ghanaian listed firms rely more on short-term debt than long-term debt with the average short-term debt to total capital ratio computed at 52 per cent and long-term debt to total capital ratio at 11 per cent.

Chechet and Olayiwola (2014) examine capital structure and profitability of Nigerian listed firms from the agency cost theory perspective on a sample of 70 out of 245 firms listed on the NSE for a period of 10 years, 2000 to 2009. The study which adopted panel data methodology approach employed two independent variables (debt and equity) as surrogates of capital structure and profitability as the only dependent variable. The findings reveal that debt ratio is negatively related to profitability and equity has significant and positive impact on firm

performance, profitability. Accordingly, the findings are consistent with prior empirical studies as well as conventional wisdom. The study recommends among others that firms experiencing financing problem and wishing to raise funds for operations or expansion should go for equity and if insufficient, should employ as little debt as possible.

Hasan, Ahsan, Rahaman and Alam (2014) study the influence of capital structure on performance of 36 Bangladeshi firms listed on the Dhaka Stock Exchange from the period 2007 to 2012. The study which excludes financial services firms owing to their different capital structures and operations uses four performance measures; earnings per share (EPS), return on equity (ROE), return on assets (ROA) and Tobin's Q as measures of firm performance and three capital structure ratios; short-term debt, long-term debt and total debt as independent variables. Using panel data regression method, the authors find that whereas EPS is significantly positively related to short-term debt, same is also significantly negatively related to long-term debt. The results also reveal a significant negative influence of capital structure on ROA. However, the results did not provide evidence of a significant influence of capital structure on firm performance as measured by ROE and Tobin's Q. Thus, the study concludes that capital structure has negative impact on firm performance, a finding that is consistent with the pecking order hypothesis.

The findings from the above empirical studies are inconclusive. These ambiguities may be due to differences in theoretical frameworks and estimation methods. Some studies over-parametrized their models by including control variables like size and age of the firm. Though, these factors are known to affect firm performance, they cannot in anyway be classified as elements of capital structure, hence, may end-up over-blurring the picture.

3.0 Data and Methodology

Annual data extracted from the annual report and accounts of the sampled DMBs spanning the period 2005 through 2014 were used for the study. The study utilises gross earnings otherwise known as gross profit or gross income and defined as total revenue that accrues to a bank in a financial year as dependent variable. The study also employed independent variables (components of capital structure) in form of owners' funds also known as shareholders' funds, insiders' funds or equity defined as ordinary shares plus retained earnings and reserves; and borrowed funds otherwise known as outsiders' funds, liabilities or debt comprising of short-term (current liabilities), customer deposits, long-term liabilities and other liabilities as compiled by the reporting institutions.

The population of the study comprises of an average of 21 DMBs between 2005 and 2014. The study adopts a purposive (non-probability) sampling technique as only banks that were present on the NSE throughout the study period and have available data were selected. In other words, banks that were quoted after 2005 as well as those that were delisted from the market in between the study period were not included in the study. This is to ensure a balanced panel data set, thus a total number of 13 banks were covered.

Following both the theoretical and empirical literature earlier reviewed, it is pertinent to submit that the relationship between firm financial performance and capital structure from the perspective of owners' funds and borrowed funds can best be mathematically represented as:

$$GE_t = \delta_0 + \delta_1 OF_t + \delta_2 BF_t + \mu_t \quad (3.1)$$

Where GE represents firm financial performance proxied by gross earnings, OF denotes owners' funds represented by shareholders' equity, BF stands for borrowed funds proxied by total deposit liabilities and debt, μ is the error term, δ_0 is a constant, δ_1 and δ_2 are coefficients of their respective variables and t is time dimension.

This study applies autoregressive distributed lag (ARDL) otherwise known as bounds test proposed by Pesaran, Shin and Smith (2001) to model equation (3.1). The ARDL approach is a valid asymptotic inference that examines the cointegration relationships among variables irrespective of the order on integration of data. The choice of the model is based on three major considerations: First, it yields a consistent estimate of the long-run coefficients regardless of whether the underlying regressors are stationary at $I(0)$ or $I(1)$ or a mixture of both. Two, it provides unbiased estimates of the long-run model as well as valid t -statistics even if some of the regressors are endogenous and third, it is highly friendly to small sample size (Yaaba, 2013).

Thus, the equation becomes:

$$\Delta LGE_t = \delta_0 + \sum_{i=1}^{\rho} \delta_1 \Delta LGE_{t-i} + \sum_{i=0}^{\rho} \delta_2 \Delta LOF_{t-i} + \sum_{i=0}^{\rho} \delta_3 \Delta LBF_{t-i} + \omega_1 LGE_{t-1} + \omega_2 LOF_{t-1} + \omega_3 LBF_{t-1} + \mu_t \quad (3.2)$$

Where L stands for natural logarithm, Δ is change, \sum represents summation, ρ is optimal lag, δ_0 is a constant, δ_1 to δ_3 are coefficients of the short-run variables, ω_1 to ω_3 are the coefficients of the long-run components and all other variables are as defined under equation (3.1).

According to Engle-Granger Representation Theorem, all variables that have long-run relationship must also converge in the short-run (Engle & Granger, 1987). Hence, the general error correction version (short-run version of the ARDL model) of equation (3.2) becomes:

$$\Delta LGE_t = \delta_0 + \sum_{i=1}^{\rho} \delta_1 \Delta LGE_{t-i} + \sum_{i=0}^{\rho} \delta_2 \Delta LOF_{t-i} + \sum_{i=0}^{\rho} \delta_3 \Delta LBF_{t-i} + \gamma ECM_{t-1} \quad (3.3)$$

Where ECM is the error correction version of equation (3.2) and all other variables are as defined under equations (3.1) and (3.2).

4.0 Empirical Results

4.1 Statistical Properties of the Data

4.1.1 Descriptive Statistics

The descriptive statistics which generally explore the characteristics of the data include; the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera, probability as well as number of observations per each variable.

Table 1: Summary Statistics

	<i>GE</i>	<i>OF</i>	<i>BF</i>
Mean	83700000000	153000000000	740000000000
Median	81900000000	174000000000	584000000000
Maximum	181000000000	274000000000	1710000000000
Minimum	74900000000	141000000000	528000000000
Std. Dev.	56700000000	91400000000	537000000000
Skewness	0.26	-0.44	0.52
Kurtosis	1.91	1.74	1.98
Jarque-Bera	7.89	12.83	11.54
Probability	0.02	0.00	0.00
Observations	130	130	130

Source: Authors Calculation using Eviews Version 7.0.

The sampled DMBs reported average gross earnings of ₦83.7 billion, a mean owners' funds of ₦153 billion, an average value of borrowed funds of ₦740 billion with the standard deviations for gross earnings, owners' and borrowed funds computed at ₦56.7 billion, ₦91.4 billion and ₦537 billion respectively. The deviations from the averages of these magnitudes signify that the DMBs do not generate similar gross profits and do not also employ similar amount of owners' and borrowed funds in their operations. The results further suggest that about 83 per cent of total assets employed by DMBs in Nigeria are represented by debt, confirming the hypothesis that banks are highly geared institutions. In comparative terms, about 89 and 75 per cents of capital in the Sri Lankan and Ghanaian banking sectors are respectively represented by outsiders' funds.

Whilst the minimum gross earnings of the studied DMBs stood at ₦7.49 billion, the maximum is ₦181 billion. However, when the minimum owners' funds is found to be ₦14.1 billion, the maximum stood at ₦274 billion. For borrowed funds, the minimum and maximum are ₦52.8 billion and ₦1.71 trillion respectively. The implication of these findings is that most of the studied banks use more of debt than equity which profits bank owners than the creditors in good times, but harmful when performance is very low.

The statistics also showed that both owners' and borrowed funds are asymmetrical as their means and medians reported disparate numerical values. Whereas gross earnings and borrowed funds are positively skewed implying that a greater proportion of the items are concentrated on the right hand side of the distribution, owners' funds is skewed to the left. The lowest Kurtosis of 1.74 for *OF* and the highest of 1.98 for *BF* further denote the variance of the capital structure components of the DMBs throughout the sample period.

4.1.2 Correlation Coefficients

As presented in Table 2, the correlation results yielded a triangular matrix. It reveals positive relationships among all the variables. The association of *GE* and *OF*, and that of *GE* and *BF* is about 93.0 per cent each while that of *OF* and *BF* stands at 91.0 per cent.

Table 2: Correlation Matrix

Variables	<i>GE</i>	<i>OF</i>	<i>BF</i>
<i>GE</i>	1.000		
<i>OF</i>	0.927	1.000	
<i>BF</i>	0.933	0.913	1.000

Source: Authors Calculation using Eviews Version 7.0.

The high degree of association among all the variables presupposes the existence of autocorrelation. However, since the empirical model is autoregressive distributed lag, the model is run at log level and the Durbin Watson statistics of 2.277 as indicated in Table 4 proves that the log-linear equation fairly resolves the problem of autocorrelation at least in the long-run.

4.1.3 Unit Root Test

The study adopts a panel unit root test consisting of Levin, Lin and Chu; Im, Pesaran and Shin; Augmented Dickey-Fuller (ADF) -Fisher Chi-Square and Phillips-Perron (PP)-Fisher Chi-Square.

Table 3: Unit Root Test

	<i>GE</i>		<i>OF</i>		<i>BF</i>	
	<i>I(0)</i>	<i>I(1)</i>	<i>I(0)</i>	<i>I(1)</i>	<i>I(0)</i>	<i>I(1)</i>
Levin, Lin & Chu	-2.488*	-21.895*	-3.899*	-9.039*	6.036	-3.169*
Im, Pesaran and Shin W-stat	1.971	-11.024*	1.295	-2.959*	5.999	0.147
ADF - Fisher Chi-square	6.871	149.038*	9.892	55.773*	0.461	18.639
PP - Fisher Chi-square	3.778	219.382*	6.856	147.850*	0.011	52.603*

Source: Authors Calculation using Eviews Version 7.0.

Note: *, ** and *** imply 1.0, 5.0 and 10.0 per cents levels of significance respectively

The result as reported in Table 3 reveals that although none of the variables is *I(2)*, they are a mixture of *I(0)* and *I(1)*. Hence, provides strong evidence in support of the use of autoregressive distributive lag.

4.2 Inferential Results

This subsection is divided into two such that section 4.2.1 analyses the long-run results and 4.2.2 presents the short-run dynamics which shows adjustment to equilibrium in case of distortions. The plots of the residual as well as fitted, actual and residual are presented as Figures 1 and 2.

4.2.1 Long-Run Coefficients

Table 4 reports the long-run coefficients of the estimated ARDL equation. The R^2 of 75.0 per cent as well as the adjusted R^2 of 74.0 per cent is an indication that the overall model is fairly represented. The F-Statistics of 57.31 provides evidence in support of cointegration as it is above the upper bound of 5.61 for $k = 3$ as obtained from Pesaran et al. (2001) Table CI (iii), Case III- Unrestricted Intercept and No Trend.

From the estimated long-run coefficients, both owners' funds (*OF*) and borrowed funds (*BF*) yield significant positive relationship with gross earnings (*GE*). The results imply that gross earnings of DMBs in Nigeria are significantly positively influenced by both owners' and borrowed funds. However, the magnitude of borrowed funds is relatively higher than that of owners' funds. By this result, the gross earnings of banks in Nigeria within the study period were more of a function of borrowed funds than owners' funds.

Table 4: Long-Run Coefficients of the Estimated ARDL Equation

Dependent Variable: <i>LGE</i>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
<i>LOF</i>	0.418	0.611	2.961	0.004
<i>LBF</i>	0.601	0.595	4.371	0.000
$R^2 = 0.75$		F = 57.31 (3, 97) [0.000]		DW = 2.277
Adjusted $R^2 = 0.74$		AIC = -0.459; SIC = -0.281; HQC = -0.387		

Source: Authors Calculation using Eviews Version 7.0.

Note: The bounds as contained in Pesaran et al. (2001) under $k=3$ are 2.72-3.77, 3.23-4.35 and 4.29-5.61 for 1.0, 5.0 and 10.0 per cents significant levels respectively.

AIC = Akaike Information Criterion, *SIC* = Swartzch Information Criterion, *HQC* Hannan-Quinn Criterion and *DW* = Durbin Watson Statistics.

However, these findings are consistent with the agency and static trade-off theories of capital structure and also in congruence with the empirical documentations of Idode, Adeleke, Ogunlowore and Ashogbon (2014) and Adesina, Nwidobie and Adesina (2015) when they examined Nigerian DMBs. They are nonetheless contrary to the empirical works of Awunyo-Vitor and Badu (2012) and Opoku, Audu and Anarfi (2013) in respect of Ghanaian banks and Akeem, Terer, Kiyanjui and Kayode (2014) in respect of Nigerian non-financial institutions who reported negative impacts of capital structure on profitability of their respective samples.

Whilst a 1.0 percentage point increase in borrowed funds leads to about 60.0 percentage points increase in gross earnings, a 1.0 percentage point increase in owners' funds results to only about 42.0 percentage points increase in gross earnings. This result tends to be in tune with reality not only in Nigeria but in most economies including the developed ones. A large chunk of owners' funds are in most countries including Nigeria tied down by regulatory requirements. For instance, Basels I, II and III Accords as agreed by the Basel Committee on Banking Supervision (BCBS) require that banks should hold a Tier 1 Capital not less than 8.0 per cent of their risk weighted assets (RWA). Furthermore, most countries impose stringent conditions on assets that are qualified to be listed as owners' funds. Loan loss reserves up to certain threshold are not allowed in some jurisdictions to be ploughed back into owners' funds. Relating this to Nigeria, while the international convention provides for 8.0 per cent minimum capital adequacy requirement, DMBs with national coverage in Nigeria are expected to keep a minimum of 10.0 per cent while those with international coverage are expected to keep 15.0 per cent Tier 1 capital and the systemically important banks (SIBs) are mandated to keep Tier 1 capital in relation to RWA of at least 16.0 per cent.

Although there are also restrictions on borrowed funds particularly in emerging markets and developing economies (EMDEs) including Nigeria such as cash reserve requirement (CRR) and liquidity ratio (LR), these restrictions are not as enormous and encompassing as those on owners' funds. Moreso, while restrictions on borrowed funds vary over time, those on owners' funds are relatively more permanent hence change occasionally. The colossal restrictions on owners' funds therefore greatly makes the funds less available for asset creation hence relatively lower contribution to gross earnings when compared to its counterpart that is always and almost freely available for asset creation.

4.2.2 The Error Correction Model

Table 5 shows the short-run dynamics otherwise referred to as the error correction model (ECM) of the estimated ARDL equation. Due to paucity of data and considering the annual nature of the series, the short-run is optimised at lag 1. The table demonstrates the relationship among the three variables in the short-run. Unlike in the long-run, owners' funds yielded a positive coefficient though statistically insignificant. Inference can therefore be drawn that gross earnings is mainly a function of borrowed funds in the short-run further corroborating the prevalence of borrowed funds over owners' funds even in the long-run.

Table 5: Short-Run Dynamics of the Estimated ARDL Equation

Dependent Variable: ΔLGE				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.083	0.045	1.819	0.072
$\Delta LGE(-1)$	0.111	0.123	0.904	0.369
$\Delta LOF(-1)$	0.002	0.051	0.047	0.963
$\Delta LBF(-1)$	0.480	0.164	2.926	0.004
$ECM(-1)$	-1.242	0.180	-6.887	0.000
$R^2 = 0.45$		AIC = 0.228; SIC = 0.366; HQC = 0.284		
Adjusted $R^2 = 0.42$		DW = 3.533		

Source: Authors Calculation using Eviews Version 7.0.

Note: AIC = Akaike Information Criterion, SIC = Swartzch Information Criterion, HQC Hannan-Quinn Criterion and DW = Durbin Watson Statistics.

The negative and statistically significant coefficient of the error term further buttresses the cointegration among the variables in the long-run. More importantly, it shows that in case of distortions in capital structure of DMBs in Nigeria that are capable of affecting gross earnings, equilibrium can be restored. Given the ECM of -1.242, it behoves that about 124.2 per cent of equilibrium can be restored on annual basis meaning that the restoration of equilibrium will take place in less than one year. In practical terms, equilibrium can be restored in about 10 months, 1 week and 2 days.

To check the fitness and stability of the estimated model, plots of residuals as well as fitted, actual and residual were carried out and presented as Figures 1 and 2. It is clear from Figure 2 that the fitted traces perfectly well the actual hence conclusion can be drawn that the model is fairly accurate and therefore inferences drawn from the results can be said to be significantly robust and valid.

Figure 1: Plot of the Residual of the Estimated Graph

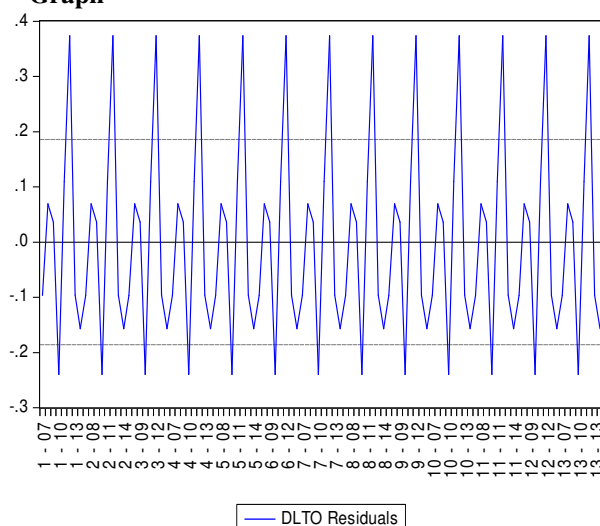
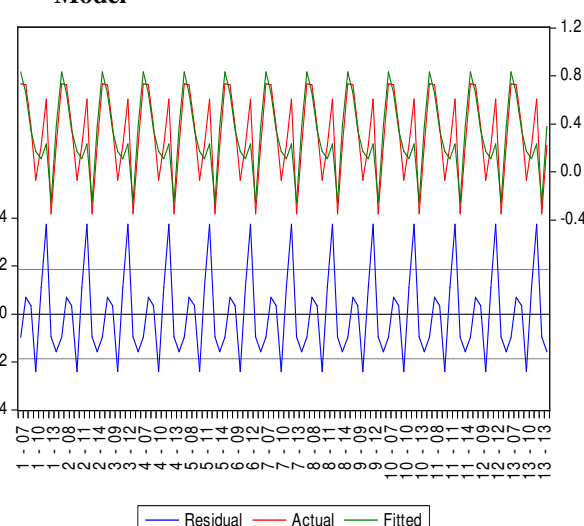


Figure 2: Actual, Fitted and Residual Model



5. Conclusion and Policy Options

The change in the capital structure of DMBs in Nigeria arising from the banking sector consolidation in 2005 led to adjustments in the regulatory capital requirements. The ratio of Tier 1 capital to risk weighted assets, for instance, increased from 8.0 per cent as provided by the Basel II Accord to 10.0 per cent for banks that operate within Nigeria. Whilst banks that have international presence were required to have Tier 1 capital at 15.0 per cent, the systemically important banks were mandated to keep Tier 1 capital at 16.0 per cent (CBN, 2010).

However, this policy affects the contribution of the components of capital and hence performance of DMBs in the country. This prompted several empirical studies on the impact of the new capital structure on banks' financial performance. However, most of the studies considered bank performance variables such as return on assets, return on equity, profit before and after tax among others. Although, these are conventional performance variables but undoubtedly under-represent the performance of banks in terms of gross income generated by the capital. Therefore, this study uses gross earnings, which is the total income generated via the application of the total capital available to banks. The study applies autoregressive distributed lag model on annual data of 13 DMBs from 2005 through 2014 and finds that borrowed funds is more prevalent in contributing to the performance of DMBs during the study period.

Following these findings therefore, the study recommends that DMBs in Nigeria should study and understand the dynamics of capital structure to enable them make optimal capital mix decision. Since debt is more critical in boosting profitability of banks in Nigeria, DMBs should employ high debt-to-equity ratio in their operations in order to reduce weighted average cost of capital and enhance gross profit. The study also suggests the use of more debt in financing real investment with positive net present values. The management and board of directors of DMBs should incentivise lenders and depositors so as to enhance easy access to funds other than shareholders'. Additional incentives on depositors' and creditors' funds such as increase in their returns are capable of attracting more funds from the investing public to create assets.

There is also the need for the banks to curb excessive appetite for risk and control cases of moral hazards so as to enhance the confidence of both debenture holders and other long-term lenders. Moderation of risk is likely to enhance the confidence of the long-term creditors on the security of their funds which will eventually increase their patronage of the institutions and thus enable the banks to have in their possession, for a relatively longer period of time, the funds.

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